

**أسبوع جامعة الإمارات العربية المتحدة للابتكار**  
**أسبوع الإمارات للابتكار**

**UAEU INNOVATION WEEK**

**UAE INNOVATION WEEK**

**UAEU Annual Research and Innovation  
Conference 2016**

**Program and Abstracts**

21 - 22 November 2016

Al Ain, United Arab Emirates





**Under the Patronage of His Excellency**

**Dr. Ali Rashid Al Noaimi**

**Chancellor of UAEU**

**The UAEU Organizes the**

**UAEU Annual Research and Innovation Conference 2016**

November 21-22, 2016

E1 Building, UAE University

Al Ain, United Arab Emirates

### Welcome Message from the General Chair

The Research & Innovation Conference is organized annually by the Division of Research and Graduate Studies on UAEU campus in Al-Ain on the National Week of Innovation. This year, it will be held on November 21-22, 2016 at the College of IT building on the male side and its focus will be on health related research, which includes the following areas:

1. Medical sciences (Diabetes, Cardiovascular Diseases, Cancer, Infection & Inflammation, Neuroscience, Genetics).
2. Public Health (Occupational and Environmental Health, Nutrition, Injury Prevention, Detection and Control of Infectious Diseases).
3. Health technology (e-health, Nanotechnology, Body-Area Network, Imaging and Image processing).

The conference is meant to offer an interdisciplinary forum and an open platform for experts, students, and the industry in various disciplines related to Health Sciences, Public Health and Health Technology to meet and discuss health challenges and solutions.

The focus and format of the conference are designed so as to:

- Bring together UAEU Faculty, Graduate, Undergraduate Students and Researchers from within UAE and neighboring region in order to share their latest research findings on a variety of research topics related to health, to enrich discussion among researchers and to become familiar with research projects conducted by their colleagues at the University.
- Provide a platform to strengthen collaborations in scientific research and innovation between the university and the various institutions/industries within the UAE and the region
- Disseminate the recent scientific advancements made by the UAEU researchers to the community at large and to promote the role of the university as a launching platform for scientific research and innovation in the country.

This year, the conference consists of two keynote speakers, five invited external and internal speakers and thirty two oral presentations in two parallel sessions, besides sixty six poster contributions. We hope to provide for an environment of fruitful discussion with representatives of the local health industry to explore the ways and means by which scientists can help in finding practical solutions to issues faced by these industries. Students who participated in the Summer Undergraduate Research Experience 2016 will also have the opportunity to present their projects the form of posters.

The organizers of the conference wish all participants a wonderful time, fruitful discussions and a beneficial research exchange.

**Professor Ghaleb Ali Al Hadrami Al Breiki**  
**Deputy Vice Chancellor for Research and Graduate Studies**

### **About UAEU:**



Law; Medicine and Health Sciences; and Science. With a distinguished international faculty, state-of-the-art new campus, and full range of student support services, UAEU offers a living-learning environment that is unmatched in the UAE.

The first and foremost comprehensive national university in the United Arab Emirates. Founded in 1976 by the late Sheikh Zayed Bin Sultan Al Nahyan, UAEU is a comprehensive, research-intensive university enrolling approximately 14,000 Emirati and international students. As the UAE's flagship university, UAEU offers a full range of accredited, high-quality graduate and undergraduate programs through nine Colleges: Business and Economics; Education; Engineering; Food and Agriculture; Humanities and Social Sciences; IT;

### **About Al Ain City:**



connecting Al Ain, Abu Dhabi and Dubai form a geographic triangle in the center of the country.

Al Ain, also known as the Garden City due to its greenery, is the second largest city in the Emirate of Abu Dhabi and the fourth largest city in the United Arab Emirates. With a population of 568,221 (2010), it is located approximately 140 km east of the capital Abu Dhabi and about 120 km south of Dubai.

Al Ain is the birthplace of Sheikh Zayed bin Sultan Al Nahyan, the first president of the United Arab Emirates, and it has the country's highest number of Emirati nationals. Al Ain is located in Abu Dhabi, inland on the border with Oman. The freeways



**About UAE:**



The United Arab Emirates sometimes called the Emirates or the UAE, is an Arab country in the southeast of the Arabian Peninsula on the Arabian Gulf, bordering Oman to the east and Saudi Arabia to the south, as well as sharing sea borders with Qatar and Iran.

The UAE is a federation of seven emirates. Each emirate governed by a hereditary emir, one of whom selected as the president of the federation of seven

emirates. The constituent emirates are Abu Dhabi, Ajman, Dubai, Fujairah, Ras al-Khaimah, Sharjah, and Umm al-Quwain.



## Table of Contents

Table of Contents .....	7
Conference General Chair .....	8
Conference Chairs .....	8
Organizing Committee .....	8
Scientific Committee .....	9
Technical Program Committee .....	10
Keynote Speakers .....	11
Program-at-Glance .....	14
Program Details .....	17
PRESENTATION ABSTRACTS .....	29
POSTERS ABSTRACTS .....	69
SURE ABSTRACTS .....	137

### Conference General Chair

**Prof. Ghaleb Alhadrami** Deputy Vice Chancellor for Research and Graduate Studies

### Conference Chairs

Prof. Maamar Benkraouda Chair of Scientific Committee  
Prof. Nagi Wakim Chair of Organizing Committee

### Organizing Committee

Prof. Nagi Wakim College of Graduate Studies  
Prof. Maamer Benkraouda Research & Sponsored Projects Office  
Dr. Shawqi Kharbash UAEU Science and Innovation Park  
Dr. Ibrahim Sidawi Research & Sponsored Projects Office  
Ms. Amal Al-Hassani College of Graduate Studies  
Ms. Naeema Al-Hassani Research & Sponsored Projects Office  
Mr. Mohamed Al- Hemaury Research & Sponsored Projects Office  
Mr. Omar Obaid Alsuwaidi Research & Sponsored Projects Office  
Ms. Fahmida Luna College of Graduate Studies  
Mr. Mohamed Madi UAEU Science and Innovation Park  
Mr. Ibrahim Talal Division of Research and Graduate Studies  
Ms. Wafaa Al Kaabi Division of Research and Graduate Studies  
Mr. Jassim Al harmodi Media and Communications Dept.  
Member Media and Communications Dept  
Member Information Technology Sector



## Scientific Committee

Prof. Maamer Benkraouda	Research & Sponsored Projects Office
Prof. Nagi Wakim	College of Graduate Studies
Dr. Fernando C. Zanella	Assistant Dean for Research and Graduate Studies, CBE
Dr. Mariam Al-Shamsi	Assistant Dean for Research and Graduate Studies, CMHS
Dr. Fadwa Al Mughairbi	Assistant Dean for Research and Graduate Studies, CHSS
Dr. Ruwaya Rashed Al Kendi	Assistant Dean for Research and Graduate Studies, COS
Dr. Mohammed Abdul Muhsen Ali Salem	Assistant Dean for Research and Graduate Studies, CFA
Prof. Walid Ibrahim	Assistant Dean for Research and Graduate Studies, CIT
Dr. Ali Khalfan Alnaqbi	Assistant Dean for Research and Graduate Studies, CEDU
Dr. Mohamed Al Hammadi	Assistant Dean for Research and Graduate Studies, COL
Ms. Meera Al Mansouri	Office of the Deputy Vice Chancellor for Research and Graduate Studies
Mr. Mohamed Ibrahim	Research & Sponsored Projects Office

### Technical Program Committee

Prof. Fatima Al Maskari	Professor, CMHS
Dr. Mariam Al-Shamsi	Assistant Dean for Research and Graduate Studies, CMHS
Dr Najah Abed AbuAli	Associate Professor,CIT
Dr. Fadwa Al Mughairbi	Assistant Dean for Research and Graduate Studies, CHSS
Dr. Rabah Iratni	Associate professor, COS
Dr. Mohammed Alyafei	Assistant Dean for Research and Graduate Studies, CFA

## Keynote Speakers



**Nelson Norman,**

President, Institute of Remote Healthcare,  
Emeritus Professor of Aberdeen University, UK

## The Place of Research in the Development of Healthcare for Remote Communities

### Abstract

A system of healthcare was developed by Aberdeen University in the 1970s to cope with the new, serious medical problems created by heavy industry functioning in one of the most hostile environments on earth. The system had five essential components and was soon shown to be applicable to similar occupational groups in other parts of the world.

The key problem identified was the time and distance which separated the casualty from the hospital facilities he may need. Thus, the first priority was training of the population at risk in immediate care so this vital time interval could be covered. The special course developed worked well in the North Sea but also in the Middle and Far East. Following its establishment into the UAE oilfields the Department of Community Medicine at the UAE University introduced it to the Police Directorate and provided training for Traffic Policemen at the scene of Road traffic accidents, saving many lives.

The development of increasingly sophisticated communications was equally important and telemedicine was initially researched in Aberdeen before its introduction into the UAE by the UAE University where it was shown to have an important function in remote education.

An appropriate system of evacuation was also considered to be an equally important part of the basic system. Once again the UAE University investigated the possibility of establishing communications between an ambulance and the A&E department of a hospital so that advice could be given to the ambulance personnel during transport. Technology was not sufficiently advanced then but it is now. The research could thus now be taken to a successful conclusion.

Now that a system of remote healthcare has been developed for the oil and gas industry attention should be directed towards determining whether it can be modified to improve healthcare for non-

industrial, remote communities world-wide. There is a clear requirement for this in many countries with well developed health provision for urban areas. This includes Northern Canada and Northern Norway, remote areas of the Highlands and Islands of Scotland and even the Wadiis of Oman. Indeed the main roads of Abu Dhabi and Dubai together with high rise buildings could be regarded as remote areas!

While oilfield healthcare is the responsibility of the industry, rural community healthcare is clearly the responsibility of Governments. This needs discussion and research and that is a challenge for Universities since it implies a need for the establishment of a collaborative international research project involving two or three universities, although final decisions and funding arrangements are the responsibility of Governments in this case.

Possible involvement of the University sector and Governments will be discussed in the light of this background and the introduction of the system into international collaborative remote community research will be discussed in relation to suggestions on key areas for research.

### **Biography**

Professor Nelson Norman, MD, DSc PhD, FRCS (Glasg, Edin), FFOM, CB, FRSB, a graduate of the universities of Glasgow and Aberdeen started his career as medical officer for the British Antarctic Survey and then proceeded to the department of Surgery at Glasgow University on the external staff of the Medical Research Council where he investigated the use of hyperbaric oxygen in a variety of medical conditions. Proceeding next to Aberdeen University he continued work in academic surgery including continuing research on hyperbaric medicine together with the management of the critically ill surgical patient. He became an honorary consultant surgeon to the Grampian Health board and reader in surgery at Aberdeen University.

In the 1970s when the North Sea oil industry arrived he established the Institute of Environmental and Offshore Medicine in Aberdeen University in association with the medical directors of several oil companies and developed a system of medicine for the industry which also suited other remote areas such as the Middle East and the British Antarctic Survey and he was appointed to a Chair of Environmental Medicine at Aberdeen University. He looked after the serious industrial diving accidents of the 1970s and 1980s and was responsible for the establishment of the National Hyperbaric Centre in Aberdeen. Telemedicine was next developed in association with Memorial University, St John's, Newfoundland and the Robert Gordon University in Aberdeen. To take these new concepts of remote medicine and telemedicine into international areas he spent six years in Abu Dhabi as Professor of Community Medicine at the UAE University.

He finally established the Institute of Remote Healthcare in Aberdeen in 2007 as an independent academic institution but with academic associations with the Robert Gordon University, the Royal College of Physicians and Surgeons of Glasgow and the Royal College of Surgeons of Edinburgh. He was appointed Emeritus Professor at Aberdeen University in 1997, Adjunct Professor at the UAE University in 2006, Honorary Professor at the Robert Gordon University in 2012 and in 1999 he received the Polar Medal.



**Paul Murray,**  
**Institute for Cancer and Genomic Medicine,**  
**University of Birmingham, UK**

## **Epstein-Barr virus and lymphomas: silent passenger becomes pathogen**

### **Abstract**

The Epstein-Barr virus (EBV) is a ubiquitous herpesvirus that persists for the lifetime of its human host, in most cases resulting in an asymptomatic and harmless infection. However, in a minority of individuals EBV can contribute to the development of cancers of different lineages. Focusing on the EBV-associated lymphomas, this lecture will summarise what is known about the mechanisms of asymptomatic viral carriage and explore how disruption of these normal homeostatic processes can lead to cancer development. In doing so it will also consider how this new knowledge is helping to drive the development of novel therapies for EBV-associated malignancies.

### **Biography**

During his PhD studies in the laboratory of Professor Lawrence Young at the University of Birmingham (1992-1996), Murray made several important contributions to the field, including the demonstration of unique patterns of virus latency in EBV-associated Hodgkin lymphoma (e.g. Murray et al., *J Pathol*; 1992) which subsequently led to the description of three epidemiologically and clinically distinct forms of EBV-associated Hodgkin's lymphoma (e.g. Murray et al., *Blood*; 1999). The impact of these studies was recognized by the award of a prestigious Louise Buchanan Fulbright Fellowship which funded Murray's post-doctoral studies in the laboratory of Professor Richard Ambinder at the Johns Hopkins University Medical School, Baltimore.

This work led to three major papers, two of which (Murray et al., *Blood*; 1996, Murray et al., *Blood*; 1998) provided much of the underpinning evidence to support the use of cytotoxic T cells for the treatment of EBV-associated lymphomas, an approach which has since been shown to be highly successful in controlling post-transplant lymphomas. In 2000 Murray set up his own laboratory in the Department of Pathology at the University of Birmingham and initiated studies on B cell lymphomas that contributed several important discoveries in the field, including: the first description of the c-FLIP-mediated anti-apoptotic phenotype in lymphoma (Dutton et al., *PNAS* 2003); the discovery of aberrant mTOR kinase activation in Hodgkin's lymphoma which subsequently led to the successful use of the mTOR inhibitor, everolimus, in the treatment of patients with relapsed Hodgkin's lymphoma (Dutton et al., *J Pathol* 2005); and the identification of collagen receptor signalling as a mediator of chemotherapy resistance in lymphoma (Cader et al., *Blood* 2013).

Recently, The Murray lab' has developed new in vitro systems which have allowed interrogation of the early steps in B cell lymphomagenesis (e.g. Vrzalikova et al., *Blood* 2011); studies which are already beginning to impact the design, discovery and pre-clinical evaluation of therapeutic approaches to cure children with B cell lymphomas.

**UAEU Annual Research and Innovation Conference 2016**

**Program-at-Glance**

**Day 1: Monday, November 21<sup>st</sup>, 2016 (Venue: CIT Building, Male Campus)**

<b>Time</b>	<b>Description</b>
08:00	Welcome Reception & Registration
09:30	Opening Ceremony ( <b>CIT Auditorium</b> ): <b>Prof. Mohamed Albaili</b> <b>UAEU Vice-Chancellor</b>
9:40	Keynote Lecture ( <b>CIT Auditorium</b> ): <b>The Place of Research in the Development of Healthcare for Remote Communities</b>  Prof. Nelson Norman, <i>President, Institute of Remote Healthcare, Emeritus Professor of Aberdeen University, UK</i>
10:30	<i>Coffee Break</i>
11:00	Director of Center Talk ( <b>CIT Auditorium</b> ):  <b>Zayed Center for Health Sciences: Innovations in Research</b>  Prof. Fatima Al Meskari, <i>Director of Sheikh Zayed center for Health Sciences</i>
11:10	Director of Center Talk ( <b>CIT Auditorium</b> ):  <b>A runway toward a new era of plant biotechnology in UAE</b>  Dr. Khalid Amiri, <i>Director of Khalifa Center for genetic engineering and biotechnology</i>
11:20	Invited Talk 1 ( <b>CIT Auditorium</b> ):  <b>A Cardiologist's view of next-generation telemedicine systems</b>  Prof. Paolo Emilio Puddu, <i>Department of Cardiovascular Sciences, Sapienza University of Rome, Italy</i>

Time	Description
11:50	Invited Talk 2 ( <b>CIT Auditorium</b> ): <b>Digital transformation of healthcare services, the role of human resources for health</b> Prof. Luis Lapão, <i>Global Health and Tropical Medicine, Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa, Portugal</i>
12:20	Poster Session: (CIT Building - Ground Floor – Male and Female Campus)
14:30	Invited Talk 3 ( <b>Lecture Hall E1-1028</b> ) <b>Octofusion – The omnipresent fusion of medicine – engineering &amp; humanities</b> Dr. Balamurugan Mangaleswaran, <i>Brain, Spine Hospital &amp; Consultant Neurosurgeon, Apollo Hospital, India, Chennai</i> Oral Presentations: Faculties/Students Session 1: <b>Cardiovascular Disease/ Diabetes/ Infection &amp; Inflammation (CIT Building, Lecture Hall E1-1028)</b> Session 2: <b>Detection and control of infectious diseases, Occupational and Environmental Health (CIT Building, Lecture Hall - 1027)</b>

**Day 2: Tuesday, November 22<sup>nd</sup>, 2016 (Venue: E1 Building Male Campus)**

<b>Time</b>	<b>Description</b>
08:00	Welcome Reception & Registration
10:30	Keynote Lecture ( <b>CIT Auditorium</b> ):  <b>Epstein-Barr virus and lymphomas: silent passenger becomes pathogen</b>  Prof. Paul Murray, <i>Institute for Cancer and Genomic Medicine, University of Birmingham, UK</i>
11:20	Invited Talk 4 ( <b>CIT Auditorium</b> ):  <b>Targeting Triple Negative Breast Cancer With Carnosol, A New Histone Acetyl Transferase Inhibitor</b>  Dr. Rabah Iratni , <i>Biology Department, College Of Science, UAEU</i>
11:50	Invited Talk 5 ( <b>CIT Auditorium</b> ):  <b>Is the United Arab Emirates Ready for the Era of Genomic Medicine?</b>  Prof. Bassam Ali, <i>Department of pathology, College of Medicine and Health Sciences, UAEU</i>
12:20	Poster Session: (CIT Building - Ground Floor – Male and Female Sides)
14:30-17:00	Oral Presentations: Faculties/Students  Session 3: <b>Cancer, genetics and stem cell research (CIT Building, Lecture Hall E1- 1028)</b>  Session 4: <b>Non-communicable chronic diseases and Injury prevention, Nutrition, Health Systems (CIT Building, Lecture Hall E1- 1027)</b>



## UAEU Annual Research and Innovation Conference 2016

### Program Details

**MONDAY NOVEMBER 21, 2016**

**Location: CIT Building, Male Campus, UAEU**

<b>Time</b>	<b>Description</b>	<b>Location</b>
<b>8:00 – 16:00</b>	<b>REGISTRATION</b>	<b>CIT Ground floor (Male)</b>
<b>9:30 – 9:40</b>	<b>Prof. Mohamed Albaili</b> UAEU Vice-Chancellor	<b>CIT Auditorium (Male Campus)</b>
<b>Chair: Dr. Maryam Al Shamsi (College of Medicine and Health Sciences, UAEU)</b>		
<b>9:40- 10:30</b>	<b>KEYNOTE LECTURE:</b> <b>K1. The Place of Research in the Development of Healthcare for Remote Communities.</b>  <i>Prof. Nelson Norman, President, Institute of Remote Healthcare, Emeritus Professor of Aberdeen University, UK</i>	<b>CIT Auditorium (Male Campus)</b>
<b>10:30- 11:00</b>	<b>COFFEE BREAK</b>	<b>CIT Ground floor (Male Campus)</b>
<b>11:00 – 11:10</b>	<b>Zayed Center for Health Sciences: Innovations in Research</b>  <i>Prof. Fatima Al Meskari, Director of Sheikh Zayed center for Health Sciences</i>	<b>CIT Auditorium (Male Campus)</b>

Time	Description	Location
11:10 – 11:20	<p><b>A runway toward a new era of plant biotechnology in UAE</b></p> <p>Dr. Khaled Amiri, <i>Director of Khalifa Center for genetic engineering and biotechnology</i></p>	<p>CIT Auditorium (Male Campus)</p>
11:20 – 11:50	<p><b>INVITED TALK:</b></p> <p><b>I1. A Cardiologist's view of next-generation telemedicine systems</b></p> <p>Prof. Paolo Emilio Puddu, <i>Department of Cardiovascular Sciences, Sapienza University of Rome, Italy</i></p>	<p>CIT Auditorium (Male Campus)</p>
11:50 – 12:20	<p><b>INVITED TALK:</b></p> <p><b>I2. Digital transformation of healthcare services, the role of human resources for health</b></p> <p>Prof. Luis Lapão, <i>Global Health and Tropical Medicine, Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa, Portugal</i></p>	<p>CIT Auditorium (Male side)</p>
12:20 – 14:30	<p><b>LUNCH</b></p>	<p>CIT Ground floor (Male Campus)</p>
12:20 – 14:30	<p><b>POSTER SESSION</b></p>	<p>CIT Ground floor (Male &amp; Female Campus)</p>

**SESSION 1: CARDIOVASCULAR DISEASE/ DIABETES/ INFECTION & INFLAMMATION**

**Chair: Prof. Salah Gariballa (College of Medicine & Health Sciences, UAEU)**

<b>14:30 – 15:00</b>	<b>INVITED TALK:</b> <b>I3. Octofusion – The omnipresent fusion of medicine – engineering &amp; humanities</b> <i>Dr. Balamurugan Mangaleswaran, Brain, Spine Hospital &amp; Consultant Neurosurgeon, Apollo Hospital, India, Chennai</i>	<b>CIT, E1-1028</b> <b>(Male Campus )</b>
<b>15:00 – 15:15</b>	<b>S1. Structural and functional defects in diabetic atrioventricular node</b> <i>Prof. Christopher Howarth, College of Medicine and Health Sciences, UAEU</i>	<b>CIT, E1-1028</b> <b>(Male Campus )</b>
<b>15:15 – 15:30</b>	<b>S2. Mechanism of streptozotocin-induced cytotoxicity in pancreatic insulin secreting Rin-5F cells</b> <i>Ms. Arwa Al Nahdi, College of Medicine and Health Sciences, UAEU</i>	<b>(Male Campus )</b>
<b>15:30 – 16:00</b>	<b>COFFEE BREAK</b>	<b>CIT Ground floor</b> <b>(Male Campus )</b>

<b>Chair: Prof. Chris Howarth (College of Medicine &amp; Health Sciences, UAEU)</b>		
<b>16:00 – 16:15</b>	<p><b>S3. Myocardial Ischemia reperfusion injury and acute myocardial infraction: Inflammatory, apoptosis and oxidative stress changes</b></p> <p>Prof. Suhail Al Salam, <i>College of Medicine and Health Sciences, UAEU</i></p>	<p><b>CIT, E1-1028 (Male Campus )</b></p>
<b>16:15 – 16:30</b>	<p><b>S4. Metabolic and oxidative damage risk factors in obese Emirati women: Body mass index versus waist circumference</b></p> <p>Prof. Salah Gariballa, <i>College of Medicine and Health Sciences, UAEU</i></p>	
<b>16:30 – 16:45</b>	<p><b>S5. Colon inflammation suppresses spontaneous electrical activity: High resolution mapping study using an experimental colitis model</b></p> <p>Dr. Sandeep Subramanya, <i>College of Medicine and Health Sciences, UAEU</i></p>	
<b>16:45 – 17:00</b>	<p><b>S6. Helminths induced immunoregulation in relapsing remitting (RR) experimental autoimmune encephalomyelitis in mice (EAE)</b></p> <p>Dr. Zakeya Al Rasbi, <i>College of Medicine and Health Sciences, UAEU</i></p>	
<b>17:00 – 17:15</b>	<p><b>S7. The effect of black seed powder on blood glycaemia, blood lipidemia and body compensation on adults at risk for cardiovascular diseases</b></p> <p>Dr. Ayesha Al Dhaheri, <i>College of Food and Agriculture, UAEU</i></p>	
<b>17:15 – 17:30</b>	<p><b>S8. Acute Middle East Respiratory Syndrome Coronavirus: Temporal Lung Changes Observed on the Chest Radiographs of 55 Patients.</b></p> <p>Dr. Karuna Das, <i>College of Medicine and Health Sciences, UAEU</i></p>	

<b>SESSION 2: DETECTION AND CONTROL OF INFECTIOUS DISEASES, OCCUPATIONAL AND ENVIRONMENTAL HEALTH</b> Chair: <i>Prof. Tibor Pal (College of Medicine &amp; Health Sciences, UAEU)</i>		
14:30 – 14:45	<b>S9. Containing a super-spreading event of the MERS-Coronavirus in the Hajj season</b> Mr. Nasser Al Darmaki, <i>Department of Mathematics, College of Science , UAEU</i>	<b>CIT, E1-1027 (Male Campus)</b>
14:45 – 15:00	<b>S10. Sero-prevalence of vaccine-preventable diseases among medical students in the United Arab Emirates</b> Dr. Mohamud Sheek-Hussein, <i>College of Medicine and Health Sciences, UAEU</i>	
15:00 – 15:15	<b>S11. Dissemination of Bla<sub>oxaA</sub>- 181 plasmids in the UAE</b> Dr. Agnes Sonnevend, <i>College of Medicine and Health Sciences, UAEU</i>	
15:15 – 15:30	<b>S12. Plasmid-mediated Colistin resistance in the Arabian Peninsula</b> Prof. Tibor Pal, <i>College of Medicine and Health Sciences, UAEU</i>	
15:30 – 16:00	<b>COFFEE BREAK</b>	<b>CIT Ground floor (Male Campus)</b>

Chair: <i>Dr. David Thompson (College of Science, UAEU)</i>		
16:00 – 16:15	<p><b>S13. Cognitive Behavioral Therapy in confined environments in an Arab Country: Case Study Reports</b></p> <p><i>Dr. Fadwa Al Mughairbi, College of Humanity and Social Sciences , UAEU</i></p>	<p><b>CIT, E1-1027</b> <b>(Male Campus)</b></p>
16:15 – 16:30	<p><b>S14. Aircraft noise around Abu Dhabi International Airport and its impact on local community and workers health</b></p> <p><i>Dr. Khaula Al Kaabi, College of Humanity and Social Sciences , UAEU</i></p>	
16:30 – 16:45	<p><b>S15. Rising temperatures and the impacts of climate change on environmental health in the tropics</b></p> <p><i>Dr. David Thomson, Department of Biology, College of Science , UAEU</i></p>	
16:45 – 17:00	<p><b>S16. Lethal temperatures surviving climate change in the UAE</b></p> <p><i>Mr. Sounak Ghosh, Department of Biology, College of Science , UAEU</i></p>	

## DAY2: TUESDAY NOVEMBER 22, 2016

Location: CIT Building, Male Campus, UAEU

Chair: <i>Dr. Rabah Iratni (College of Science, UAEU)</i>		
10:30 – 11:20	<b>KEYNOTE LECTURE:</b> <b>K2. Epstein-Barr virus and lymphomas: silent passenger becomes pathogen</b> <i>Prof. Paul Murray, Institute for Cancer and Genomic Medicine, University of Birmingham, UK</i>	CIT Auditorium (Male Campus)
11:20 – 11:50	<b>INVITED TALK:</b> <b>I4. Targeting Triple Negative Breast Cancer With Carnosol, A New Histone Acetyl Transferase Inhibitor</b> <i>Dr. Rabah Iratni , Biology Department, College Of Science, UAEU</i>	CIT Auditorium (Male Campus)
11:50 – 12:20	<b>INVITED TALK:</b> <b>I5. Is the United Arab Emirates Ready for the Era of Genomic Medicine?</b> <i>Prof. Bassam Ali, Department of pathology, College of Medicine and Health Sciences, UAEU</i>	CIT Auditorium (Male Campus)
12:20 – 14:30	<b>LUNCH</b>	CIT Ground floor (Male Campus)
	<b>POSTER SESSION</b>	CIT Ground floor (Male & Female Campus)

<b>SESSION 3: CANCER, GENETICS AND STEM CELL RESEARCH</b> Chair: <i>Dr. Farah Mustafa (College of Medicine &amp; Health Sciences, UAEU)</i>		
14:30 – 14:45	<b>S17. The metabolic sensor Pask regulates metabolism through Histone modification</b>  Dr. Starling Emerald David, <i>College of Medicine and Health Sciences, UAEU</i>	<b>CIT, E1-1028</b>  <b>(Male Campus)</b>
14:45 – 15:00	<b>S18. Epstein-Barr virus small RANAs (EBERs) play a role in providing resistance to cells from apoptosis</b>  Mr. Waqar Ahmed, <i>College of Medicine and Health Sciences, UAEU</i>	
15:00 – 15:15	<b>S19. The role of Muc1 in regulating b-catenin signaling after moderate and severe ischemic kidney injury</b>  Dr. Mohammad Al Bataineh, <i>College of Food and Agriculture, UAEU</i>	
15:15 – 15:30	<b>S20. The major packaging determinant of MTV genomic RNA resides in a bifurcated stem loop 4 (SL4) containing dimerization initiation site and single stranded purines</b>  Prof. Tahir Rizvi, <i>College of Medicine and Health Sciences, UAEU</i>	
15:30 – 16:00	<p style="text-align: center;"><b>COFFEE BREAK</b></p>	<b>CIT Ground floor</b> <b>(Male Campus)</b>

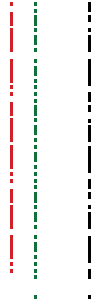


<i>Chair: Dr. Asma Al Menhali (College of Science, UAEU)</i>		
<b>16:00 – 16:15</b>	<p><b>S21. <i>Rhus Coriaria</i> inhibit migration, metastasis and tumor growth of breast cancer</b></p> <p>Ms. Khawla Athamneh, <i>Department of Biology, College of Science, UAEU</i></p>	<b>CIT, E1-1028 (Male Campus)</b>
<b>16:15 – 16:30</b>	<p><b>S22. Identification and characterization of the anti-cancer potential of indigenous medicinal plants of the Arabian Peninsula</b></p> <p>Dr. Farah Mustafa, <i>College of Medicine and Health Sciences, UAEU</i></p>	
<b>16:30 – 16:45</b>	<p><b>S23. Parathyroid hormone-like hormone (PTH LH): a novel stomach growth factor</b></p> <p>Dr. Asma Al Menhali, <i>Department of Biology, College of Science, UAEU</i></p>	
<b>16:45 – 17:00</b>	<p><b>S24. Generation of stomach spheroids using mouse gastric stem cells</b></p> <p>Ms. Shakila Afroz, <i>College of Medicine and Health Sciences, UAEU</i></p>	

<b>SESSION 4: NON-COMMUNICABLE CHRONIC DISEASES AND INJURY PREVENTION, NUTRITION, HEALTH SYSTEMS</b> Chair: <i>Dr. Jawad Hashim (College of Medicine &amp; Health Sciences, UAEU)</i>		
14:30 – 14:45	<b>S25. Toys or dangerous product? Women's awareness, attitude and practice regarding baby walker use, an interventional study</b>  <i>Prof. Michal Grivna, College of Medicine and Health Sciences, UAEU</i>	<b>CIT, E1-1027</b> (Male Campus)
14:45 – 15:00	<b>S26. Primary Health care challenges and the chronic care model in the Emirate of Abu Dhabi, UAE</b>  <i>Mrs Marilia Paulo, Lisboa/ College of Medicine and Health Sciences, UAEU</i>	
15:00 – 15:15	<b>S27. Antioxidant properties in vitro and after acute ingestion in human of a newly developed functional date seed powder bread</b>  <i>Dr. Carine Platat, College of Food and Agriculture, UAEU</i>	
15:15 – 15:30	<b>S28. Estimation of relative impact of modifiable lifestyle factors in diabetes mellitus</b>  <i>Dr. Jawad Hashim, College of Medicine and Health Sciences, UAEU</i>	
15:30 – 16:00	<b>COFFEE BREAK</b>	<b>CIT Ground floor</b> (Male Campus)

<b>Chair: Dr. Tom Loney (College of Medicine &amp; Health Sciences, UAEU)</b>		
<b>16:00 – 16:15</b>	<b>S29. Children and adolescents online BMI calculator</b> Dr. Sami Shaban, <i>College of Medicine and Health Sciences, UAEU</i>	<b>CIT, E1-1027 (Male Campus)</b>
<b>16:15 – 16:30</b>	<b>S30. Development of an online lifestyle intervention for overweight and obese</b> <b>University students in the UAE</b> Dr. Habiba Ali, <i>College of Food and Agriculture, UAEU</i>	
<b>16:30 – 16:45</b>	<b>S31. Big health data capabilities and challenges</b> Mrs. Alramzana Nujum Nawaz, <i>College of Information Technology, UAEU</i>	
<b>16:45 – 17:00</b>	<b>S32. Prototyping of microfluidic devices for cell sorting and other biological analysis</b> Mr. Mohammed Ziauddin, <i>UAEU</i>	





***ORAL PRESENTATIONS' ABSTRACTS***

**K1**

## **The Place of Research in the Development of Healthcare for Remote Communities**

**Prof. Nelson Norman**

*President, Institute of Remote Healthcare, Emeritus Professor of Aberdeen University, UK*

A system of healthcare was developed by Aberdeen University in the 1970s to cope with the new, serious medical problems created by heavy industry functioning in one of the most hostile environments on earth. The system had five essential components and was soon shown to be applicable to similar occupational groups in other parts of the world.

The key problem identified was the time and distance which separated the casualty from the hospital facilities he may need. Thus, the first priority was training of the population at risk in immediate care so this vital time interval could be covered. The special course developed worked well in the North Sea but also in the Middle and Far East. Following its establishment into the UAE oilfields the Department of Community Medicine at the UAE University introduced it to the Police Directorate and provided training for Traffic Policemen at the scene of Road traffic accidents, saving many lives.

The development of increasingly sophisticated communications was equally important and telemedicine was initially researched in Aberdeen before its introduction into the UAE by the UAE University where it was shown to have an important function in remote education.

An appropriate system of evacuation was also considered to be an equally important part of the basic system. Once again the UAE University investigated the possibility of establishing communications between an ambulance and the A&E department of a hospital so that advice could be given to the ambulance personnel during transport. Technology was not sufficiently advanced then but it is now. The research could thus now be taken to a successful conclusion.

Now that a system of remote healthcare has been developed for the oil and gas industry attention should be directed towards determining whether it can be modified to improve healthcare for non-industrial, remote communities world-wide. There is a clear requirement for this in many countries with well developed health provision for urban areas. This includes Northern Canada and Northern Norway, remote areas of the Highlands and Islands of Scotland and even the Wadis of Oman. Indeed the main roads of Abu Dhabi and Dubai together with high rise buildings could be regarded as remote areas!

While oilfield healthcare is the responsibility of the industry, rural community healthcare is clearly the responsibility of Governments. This needs discussion and research and that is a challenge for Universities since it implies a need for the establishment of a collaborative international research project involving two or three universities, although final decisions and funding arrangements are the responsibility of Governments in this case.

Possible involvement of the University sector and Governments will be discussed in the light of this background and the introduction of the system into international collaborative remote community research will be discussed in relation to suggestions on key areas for research.



**K2**

**Epstein-Barr virus and lymphomas: silent passenger becomes pathogen**

**Paul Murray**

*Institute for Cancer and Genomic Medicine, University of Birmingham, UK*

The Epstein-Barr virus (EBV) is a ubiquitous herpesvirus that persists for the lifetime of its human host, in most cases resulting in an asymptomatic and harmless infection. However, in a minority of individuals EBV can contribute to the development of cancers of different lineages. Focusing on the EBV-associated lymphomas, this lecture will summarise what is known about the mechanisms of asymptomatic viral carriage and explore how disruption of these normal homeostatic processes can lead to cancer development. In doing so it will also consider how this new knowledge is helping to drive the development of novel therapies for EBV-associated malignancies.

## 11

**A Cardiologist's view of next-generation telemedicine systems****Paolo Emilio Puddu***Department of Cardiovascular Sciences, Sapienza University of Rome, Italy*

A few questions should be answered about remote healthcare systems: (1) will they help reducing and/or at least rationalizing care; (2) will they lower hospitalizations and connected high costs?; (3) what are the relevant parameters to obtain and follow in order to make remote healthcare an impacting reality on health systems? and (4) are there methodologies to analyze the electrical signal from the heart in order to obtain a higher level of assessment of well being? The future remote healthcare model should start from strong ethical and scientific bases. The great potential benefits should be addressed on humans and on processes of care. Continuity of care, prevention and healthcare throughout the person's life are an excellent beginning. The future will not depend on our technological capacities but on our decision-making capacity. Remote healthcare should involve physicians, patients, academics, health service organizations and industries, integrating all their different points of views, not neglecting the final user's needs. Use case scenarios are reviewed here, from pre- to post-hospitalization in the management of congestive heart failure based personal experience with 2 funded European Projects: CHIRON and HEARTMAN. They point that future remote health system should provide the parameters to evaluate trends and short-term predictive indexes, based on decision-logic module that computes in an automated way the potential risk of an impending episode by information fusion of heterogeneous sensor, demographic data and evidence-based clinical diagnosis process. Finally, we address attention on heart rate changes and why this parameter might be collected to index heart risks on one hand and provide an integrated view of danger-reactions useful to index well being and happiness on the other hand. New methodologies are also sketched to go ahead the state of the art techniques and looking for possible integration with different modules.



## **Digital Transformation of Healthcare Services: The Role of Human Resources for Health**

**Luís Velez Lapão**, Habil., Ph.D., M.Sc.

*Global Health and Tropical Medicine, Instituto de Higiene e Medicina Tropical – Universidade Nova de Lisboa, Portugal*

The digital revolution is gradually transforming our society. Technology is becoming very cheap, making it pervasive to people and enterprises, and enabling it to reach more markets at a lower cost of production. However, the biggest challenger is the integration of these technologies within the traditional businesses, often requiring the development of new business models.

It also appears to be seriously threatening employment, alike previous technology revolutions (e.g. industrial and electrical). There are many examples, from Call centers that are competitively substituting the sales force, eBanking that is removing banks from the high street; Airbnb and Tripadvisor changed the travel agencies business for good.

The Internet of Things (IoT) is a new paradigm, which is bridging the gap between the physical world and its representation within the digital world. In healthcare services, IoT is about integration of the “things” that form the life of people into software applications, leveraging benefits from the information continuity.

What will be the expected effects of digitalization in healthcare? Among researchers two ideas are dominating, opposing each other. From one side, extrapolating from recent data, the skeptical picture about the payoff of new healthcare technologies, and the need to deal with healthcare reorganization due to low level of economic growth and increasing demand for services. A recent paper has shown the potential impact on unemployment from change in healthcare services, with both positive and negative outcomes. On the other, skeptical about this data, are ones more convinced of the promise of innovation in healthcare, believing that the economic gains from the eHealth revolution are still to come. The Internet and related digital technologies have produced a significant growth of information in healthcare. Emerging evidence provides support for some beneficial effects of interactive eHealth systems, although many challenges still remain with respect to understand approaches to methodology, implementation, and evaluation. Chronic diseases are the main cause of mortality throughout Europe, with prevalence and impact on the cost of care that is threatening the sustainability of health systems and pushing to significant reorganization efforts. Healthcare reorganization is being address by different approaches: from reorganizing processes and skill-mix, staff education and training; appropriate pay and reward systems; to designing new eHealth services.

eHealth services are expected, as in the banking or in the music business, to be an effective way to allow a change in the organization of services. However, there is a large gap between the promises and evidence with demonstrated benefits. This means that there are still a lot to learn and study on how to overcome the barriers that limit this process. Once eHealth services are fully developed and Ambient Assisted Living/IoT solutions are spread around what would be the actual impact on the healthcare workforce?

This talk aims at addressing the potential effects of digitalization of healthcare services on the reorganization of healthcare and on healthcare workforce.

**I3**

**Octofusion – The omnipresent fusion of medicine – engineering & humanities**

**M. Balamurugan, MD**

*Department of Neurosurgery Apollo Hospitals, Chennai, India*

Numerous engineers and scientists do work / research in many fields leading to discoveries and inventions. Many of these do not come to benefit the common man. Reverse engineering of available technology to benefit humanity – with special attention to the medical field – will be stressed with examples. Various new technologies including nanoneuroscience, medical bioengineering and 3D printing will be illustrated with examples

## Targeting Triple Negative Breast Cancer With Carnosol, A New Histone Acetyl Transferase Inhibitor

Rabah Iratni

*Biology Department, College Of Science, UAEU*

We have previously demonstrated that carnosol, a natural compound, inhibited *in vitro* cell viability and colony growth, and induced cell cycle arrest, autophagy and apoptosis in human breast cancer cells. In the present study, we evaluated the ability of carnosol to inhibit tumor growth and metastasis *in vivo*. Using chick embryo tumor growth assay, we showed that carnosol significantly and markedly suppressed tumor growth and metastasis of breast cancer. Moreover, we found that non-cytotoxic concentrations of carnosol decreased the migration and downregulated the expression and the activity of MMP-9 in the triple negative breast cancer (TNBC) MDA-MB-231 cells. Mechanistically, we demonstrated that carnosol suppressed STAT3 activation by promoting the proteasome-degradation of STAT3 protein in a panel of human breast tumor cells (MDA-MB-231, Hs578T, T47D and MCF-7). Inhibition of proteasome by two proteasome inhibitors MG-132 and bortezomib blocked STAT3 degradation. Interestingly, rescued STAT3 from degradation could neither be phosphorylated nor acetylated. Further investigations revealed that carnosol also promoted proteasome-dependent degradation of p300 in all the panel of breast cancer cells analyzed. Furthermore, in addition to promoting p300 degradation, carnosol inhibited the acetyltransferase activity of recombinant p300. Finally, *in silico* docking analysis indicated that carnosol might inhibit p300 HAT activity by blocking the entry of acetyl-CoA binding pocket of the catalytic domain. This study further confirms carnosol as a promising anti-breast cancer therapeutic compound, and identifies it as a new inhibitor of p300 to be added to the panel of inhibitors identified so far.

I5

### **Is the United Arab Emirates Ready for the Era of Genomic Medicine?**

**Prof. Bassam R. Ali**

*Department of Pathology, College of Medicine and Health Sciences, United Arab Emirates University*

The interplay between genomics and medicine led to the development of a new discipline in medicine called “Genomic Medicine”, which involves the use of genomic information about an individual as part of their clinical care. This discipline is already making a significant global impact in the fields of oncology, pharmacology, infectious diseases, rare and undiagnosed genetic conditions. The utility of genomic medicine is in providing: (1) highly accurate diagnostic tools (2) unprecedented predictive power of disease risk (3) opportunities for developing novel and personalized treatments and (4) new avenues for the development of creative prevention strategies. In recent years, we have been using molecular, genomic and cellular approaches to elucidate the underlying genetic causes and mechanisms of single gene rare disorders in the United Arab Emirates (UAE). Collectively, those disorders are particularly highly prevalent among Arab populations, including the UAE, due to the high rates of consanguinity within these populations. Our research resulted in the identification of numerous mutations in many patients with recessive disorders and the elucidation of the cellular basis of several single gene disorders. In this lecture, I will present examples on our approach of using next-generation whole-exome sequencing for the identification of disease genes and mutations underlying recessive disorders among Emirati families. In addition, the elucidation of the cellular mechanisms underlying some single gene disorders will be presented. Furthermore, the areas of research and development needed to implement genomic medicine in the UAE will be highlighted.

### Structural and functional defects in diabetic atrioventricular node

Howarth FC<sup>1</sup>, Parekh K<sup>1</sup>, Jayaprakash P<sup>2</sup>, Inbaraj SE1, Qureshi MA<sup>1</sup>, Oz M<sup>2</sup>, Dobrzynski H<sup>3</sup>,  
Adrian TE<sup>1</sup>

<sup>1</sup>Department of Physiology & <sup>2</sup>Pharmacology, College of Medicine & Health Sciences, UAE  
University, UAE <sup>3</sup>Halina Dobrzynski – Institute of Cardiovascular Sciences, University of  
Manchester, UK

The generation and propagation of electrical activity is frequently altered in diabetic heart. Prolongation of the QT interval and QRS complex correlates with an increased incidence of sudden cardiac death. Atrial fibrillation is prevalent and there is a higher incidence of atrioventricular block in diabetic patients compared to healthy controls. The streptozotocin (STZ) – induced diabetic rat is a widely used experimental model of diabetes mellitus. Previous *in vivo* biotelemetry and *in vitro* isolated perfused heart studies in our lab have demonstrated a variety of electrophysiological disturbances in STZ rat heart including prolongation of the sinoatrial node (SAN) action potential duration (APD) and sino-atrial conduction time and reduced heart rate. Increased APD, reduced action potential firing rate, upstroke velocity and rate of diastolic depolarization have also been reported in atrioventricular node (AVN) cells from STZ rat. Our recent studies have demonstrated a reduction in peak L-type Ca<sup>2+</sup> current, faster time-dependent inactivation, a negative shift in the voltage dependence of inactivation, and a slowing of restitution parameters in AVN cells from STZ rat. Modification of ion channel properties either by altered trafficking and expression, or post-translational modification of channel gating properties, may have a significant impact on AVN function, and result in clinical AVN abnormalities. The aim of the present study was to investigate changes in the expression of genes encoding more than 80 proteins that underlie the generation and propagation of electrical activity of the AVN in the diabetic heart. Diabetes was induced in male rats with STZ (60 mg/kg bodyweight, i.p.) and experiments were performed 12 weeks after treatment. Real-time RT-PCR and Western blot techniques were used to measure the expression of genes and proteins, respectively. Diabetes was characterized by a 5-fold increase in blood glucose in STZ compared to control rats. Expression of genes encoding multiple ion channel proteins were upregulated (2-9 fold) in STZ compared to Control-AVN including: ATP1B1/2B1, NCX1, TRPC1, HCN2, CAVβ2, SCN3B/4A, KV1.4, ERG-1, KIR3.1/3.4, KIR6.2, K2P3.1, NPPB (cell membrane transport), RYR2, NPPB (Ca<sup>2+</sup> transport and regulation). These changes in gene expression are likely to contribute to the electrophysiological disturbances seen in diabetic AVN. Research project supported by a grant from UAEU and NRF.

S2

### Mechanism of streptozotocin-induced cytotoxicity in pancreatic insulin secreting Rin-5F cells

Arwa M Al Nahdi, Annie John and Haider Raza

*Department of Biochemistry, College of Medicine and Health Sciences, UAEU, Al Ain, UAE*

**BACKGROUND:** Streptozotocin (STZ) is an antibiotic commonly used to develop type 1-diabetes in rodent models due to its selective genotoxicity in the pancreatic  $\beta$ -cells. Studies have suggested that STZ is preferably absorbed by insulin secreting  $\beta$ -cells and induces cytotoxicity by donating NO and producing excess of reactive oxygen species (ROS). Both apoptotic and necrotic cell death have been reported in cells treated with STZ. However, the exact mechanism of cell death and associated complications are still not clear.

**METHOD:** Using Rin-5F, insulin secreting pancreatic cells, we investigated the mechanism of STZ toxicity under in vitro conditions at different doses and time points. Cell viability, redox metabolism and mitochondrial functions were studied.

**RESULTS:** Our results showed that toxic dose of STZ induces oxidative stress caused by increased ROS and NO production and by inducing energy metabolism related stress in the mitochondria. We have also demonstrated that increased ROS production is accompanied with altered glutathione (GSH)-dependent antioxidant redox homeostasis, mitochondrial respiratory enzyme activities and alterations in cell signaling kinases involved in insulin signaling and apoptosis. SDS-PAGE and Western blot analysis have also confirmed altered expression of inflammatory and oxidative stress markers (e.g. NF- $\kappa$ B, Nrf-2, HO-1, Hsp-70, NOS-2) and expression of apoptotic proteins (caspases, Bcl-2, etc). Use of a ROS-scavenging antioxidant, N-acetylcysteine, rendered some protection against STZ-induced toxicity suggesting the attenuation of oxidative stress associated metabolic complications in Rin-5F insulin secreting cells.

**CONCLUSION:** These results are significant in understanding the mechanism of STZ- induced  $\beta$ -cell damage and may help in better understanding the etiology of type-1 diabetes induction. (The work is supported by UAEU Graduate Studies Funds, Sheikh Hamadan Medical Research Award and CMHS Research Grant Award).

### **Myocardial Ischemia Reperfusion Injury and Acute Myocardial Infarction: Inflammatory, Apoptotic and Oxidative Stress changes**

**Prof. Suhail Al-Salam**<sup>1</sup>, Dr. Satwat Hashmi<sup>2</sup>

<sup>1</sup>*Department of Pathology, College of Medicine and Health Sciences, UAEU*

<sup>2</sup>*Department of Biological and Biomedical Sciences, Agha Khan University, Pakistan.*

**BACKGROUND:** Myocardial infarction (MI) represents the death of cardiac myocytes due to extended ischemia. Myocardial reperfusion is the restoration of coronary blood flow after a period of coronary occlusion. Reperfusion has the potential to salvage ischemic myocardium but paradoxically can cause injury, a phenomenon called as 'reperfusion injury' (IR).

**METHODS:** Mouse models of myocardial ischemia reperfusion and acute myocardial infarction were used. Male C57B6/J mice (n=24) were divided into 24 hour MI group (n=8), IR group (n=8) and sham operated group (n=8). All experimental animal procedures were approved by the Animals Ethics Committee of the College of Medicine and Health Sciences, UAE University. Standard histologic, immunohistochemical and Elisa techniques were used to study the histopathologic, oxidative, apoptotic and inflammatory changes in IR and MI.

**RESULTS:** The IL-6 levels in the LV of the MI group were significantly raised as compared to the IR group ( $p=0.0008$ ). Plasma IL-6 was also significantly increased in the MI group as compared to the IR group ( $p=0.031$ ). MI model was also associated with increase in the neutrophil polymorphs number in the infarction related myocardium as compared to the re-perfused myocardium. A significant increase in troponin I level in the MI group as compared to the IR group is also seen ( $p=0.00$ ). Our IR model showed enhanced pro-apoptotic mediators like cleaved caspase-3 ( $p=0.005$ ) and cytochrome c in the myocardium as compared to the MI model.

**CONCLUSION:** Myocardial damages in MI are mainly due to ischemic necrosis and inflammatory mechanisms while apoptosis is the main mechanism of cell death in IR in addition to limited ischemic necrosis.

S4

**Metabolic and oxidative damage risk factors in obese Emirati women:  
Body mass index versus waist circumference**

**Prof. Salah Gariballa**

*Internal Medicine, College of Medicine and Health Sciences, UAEU*

**BACKGROUND:** Body mass index (BMI) may underestimate obesity related risk factors among Arab population because it doesn't account for visceral body fat distribution. Our aim was to determine whether BMI or waist circumference (WC) is a better predictor of metabolic risk factors associated with increased visceral fat among obese women from the United Arab Emirates (UAE).

**METHODS:** Three-hundred and thirty-three obese subjects who were part of a dietary intervention study had their baseline characteristics assessed from anthropometric, clinical and biochemical data following informed written consent. Fasting blood samples were collected for the measurement of markers of inflammation, endothelial dysfunction, antioxidants and oxidative damage. Outcome measures were compared between 4 equal BMI and WC quartiles.

**RESULTS:** We found significantly higher levels of education and employment and lower blood pressures readings in obese subjects in the first relative to the fourth quartile of BMI and WC distributions ( $p < 0.05$ ). We also observed significantly higher blood pressure, c-reactive protein (CRP), IL6, protein carbonyls and lower  $\beta$ -carotene levels with increased BMI and WC quartiles ( $p < 0.01$ ). Both glutathione peroxidase and adiponectin were lower and TNF- $\alpha$  higher with increased WC compared with increased BMI quartiles but results were only statistically significant for TNF- $\alpha$  ( $p = 0.032$ ).

**CONCLUSION:** Both elevated BMI and WC are associated with increased metabolic risk factors in obese Emirati women however WC is a stronger predictor when compared with BMI.



## Colon inflammation suppresses spontaneous electrical activity: High resolution mapping study using an experimental colitis model

Sandeep B Subramanya Betty Stephen and Wim J Lammers

*Department of Physiology, College of Medicine and Health Sciences, UAE University, Al Ain, UAE*

**BACKGROUND:** Inflammatory bowel disease (IBD) such as ulcerative colitis (UC) play an important role in colonic motility disorders. The genesis of UC is multifactorial but it is well known that UC patients suffer from abnormal colonic motor function. This suggest that inflammation in the colon modulate neuromuscular circuitry to influence colonic motility. The gastrointestinal motor function is controlled by complex processes in the gut involving both neurogenic (via enteric nervous system) and myogenic (initiated by interstitial cells of Cajal) activity. Electrical activity is an integral part of gastrointestinal motility, characterized by bursts of action potentials (spikes) which precede motor function. To date, no studies have looked at the pattern of electrical activity that may be affected by inflammatory processes in the colon.

**METHODS:** Male Sprague Dawley rats (initial weight 205.42±17.76g, n=8) were selected and divided into a control and a test group. The control group received *ad libitum* food and water while the test group received 5% DSS in their drinking water during 7 days. Weight, stool consistency, and rectal bleeding were monitored daily to establish their disease activity index (=DAI). On day 7, the whole colon was removed after laparotomy (anesthesia: sodium pentobarbital 60mg/kg body wt) and its length measured. The proximal colon was then isolated, opened along the mesenteric border and placed in a 300 ml-organ bath superfused with 100ml/min Tyrode solution. Spike potentials were recorded from the serosal surface using an array of 11x11 Teflon-coated silver wires (1 mm inter-electrode distance) that was sequentially positioned in steps of 11 mm in the aboral direction. The electrical signals were recorded using customized software and analyzed for frequency and total area of spike propagation.

**RESULTS:** Rats treated with 5% DSS showed a significant increase in DAI compared to the controls on day 7 (DSS 2.67±1.06, control 0.44±0.88, p<0.01). DSS group also showed a significant decrease in total colon length compared to controls (DSS 12.5±1.47 cm, control 16.0±1.08 cm, p<0.01). The colonic spontaneous spike potential frequency decreased significantly in the aboral part of the proximal colon in the DSS group compared to controls (DSS: 5.67±5.99, Control: 19.0±11.94 spikes/min p<0.001). Furthermore, the area activated by individual spikes decreased steadily in DDS compared to controls (Control: 76mm<sup>2</sup>, DSS:24mm<sup>2</sup>, p<0.001).

**CONCLUSION:** Inflammation of the colon markedly decreased frequency and large areas of spontaneous electrical activity in the proximal colon in DSS treated rats. This electrical inhibition may be one reason for the clinically observed abnormal colonic motor function seen in UC patients.

S6

### **Helminths induced immune regulation in relapsing remitting (RR)-experimental autoimmune encephalomyelitis (EAE) mice.**

**Dr. Zakeya Nasser Salem Hamad Al Rasbi**

*Department of Microbiology, College of Medicine and Health Sciences, UAEU*

Parasitic helminths, or worms, infect billions of people and their domesticated animals worldwide. Since the overall prevalence of helminthiasis is so high, even with relatively low frequencies of severe disease. It results in large numbers of people experiencing infection-associated morbidity. Deworming is rightly advocated to prevent helminth-induced morbidity. However, many studies in animals provide strong evidence that helminths can not only downregulate parasite-specific immune responses, but also modulate autoimmune and allergic inflammatory responses. The immune responses of the hosts to different worm infections are remarkably similar, being Th2 cell mediated response, with the production of significant quantities of cytokines and consequently the development of strong immunoglobulin E (IgE), eosinophil, and mast cell responses. This inherent ability of helminths to induce Th2 responses did not stop the development of relapsing remitting (RR)-experimental autoimmune encephalomyelitis (EAE) mice, as anticipated. EAE is known to be Th1 mediated disease and damped down by Th2 response. Three different groups of mice (SJL/J wild type, transgenic and EAE sick) were examined individually and in pooled groups for intensity of intestinal parasitic infection. Mice were tested for intestinal worm by ovum or egg detection (wet mount smear, flotation concentration method and perianal tape method), and B-cells proliferation and activation by gene and protein expression. Results show that there were three types of pin worms in the sick groups (*Aspiculuris tetraptera*, *Syphacia obvelata*, and *S. muris*) while transgenic host one type (*S.obvelata*) and Wild Type two pin worms (*S.obvelata* and *A.tetraptera*). Mice shed more eggs early in the morning compared evening time and female has a higher infective load compared to male. In fact, mice show infection at age of 4 weeks around exactly the same time were anti-MOG antibodies are produced, and peaks at adult and reduces again at 14 weeks of age. Resembling human pattern of acquiring helminthes infection. Also, preliminary data shows that treatment of helminths infection showed slight improvement of clinical symptoms of autoimmune diseases (EAE). RR-EAE mice are found to have three type of pinworm, activated B-cells including plasma cells, plasma blast and germinal center B-cells, were least represented in mesenteric lymph node and highly found in CNS draining lymph nodes.

## The Effect of Black Seed Powder on Blood Glycaemia, Blood Lipidemia and Body Composition on Adults at Risk for Cardiovascular Diseases

Ayesha Al Dhaheri, Dana Hassan Al Khatib, Amjad Jarrar

*Nutrition and Health Department, College of Food and Agriculture, UAEU*

**BACKGROUND:** In United Arab Emirates (UAE), 39.6% of the population were diagnosed with metabolic syndrome (MetS) according to a previous study, while the prevalence of the MetS in the Gulf Cooperation Council Countries (GCC) is 10-15% higher than in most developed countries. Abdominal obesity, high fasting blood glucose, high blood pressure, elevated triglycerides and reduced high-density lipoprotein cholesterol (HDL-C) are the risk factors for MetS. Traditional spices, such as black seed, are used as medications for treating some of these diseases. However, several studies have proven that black seed has antioxidant, anti-inflammatory, anti-diabetic, lipid-lowering functions and thymoquinone was found to be the active form of black seeds.

**OBJECTIVE:** To measure the effect of 3 grams of black seed (*Nigella Sativa*) powder for 12 weeks on participants at risk for cardiovascular diseases for fasting blood glucose, HbA1c levels, blood pressure, blood lipid profile levels and waist circumference.

**METHODOLOGY:** A controlled, randomized, single blind, parallel-design study conducted on 51 participants with risk of developing heart diseases. Participants were randomly assigned to consume either 3g/day of black seed powder or placebo for 12 weeks. Each of weight, height, waist circumference, body composition and systolic and diastolic blood pressure were measured at baseline, midpoint (after 6 weeks) and endpoint (after 12 weeks). Fasting blood glucose, HbA1c, total cholesterol, LDL-C and HDL-C were tested at baseline, midpoint and endpoint.

**RESULTS:** After 12-weeks consumption of black seed powder, each of waist circumference, percent body fat, cholesterol, HDL and LDL levels were highly significantly improved (p-value < 0.01). In addition, body weight and triglyceride level were significantly improved (p-value < 0.05).

**CONCLUSION:** Consumption of 3g of black seed powder daily for 12 weeks have shown positive effect on fasting blood glucose, blood pressure, blood lipid profile levels and waist circumference on individuals who are at risk of developing cardiovascular diseases.

S8

### Acute Middle East Respiratory Syndrome Coronavirus: Temporal Lung Changes Observed on the Chest Radiographs of 55 Patients.

Das KM, Lee EY, Singh R, Langer R.

*Department of Radiology, CMHS, UAEU*

**OBJECTIVE:** The objective of our study was to describe lung changes on serial chest radiographs from patients infected with the acute Middle East respiratory syndrome coronavirus (MERS-CoV) and to compare the chest radiographic findings and final outcomes with those of health care workers (HCWs) infected with the same virus. Chest radiographic scores and comorbidities were also examined as indicators of a fatal outcome to determine their potential prognostic value.

**MATERIALS AND METHODS:** Chest radiographs of 33 patients and 22 HCWs infected with MERS-CoV were examined for radiologic features indicative of disease and for evidence of radiographic deterioration and progression. Chest radiographic scores were estimated after dividing each lung into three zones. The scores (1 [mild] to 4 [severe]) for all six zones per chest radiographic examination were summed to provide a cumulative chest radiographic score (range, 0-24). Serial radiographs were also examined to assess for radiographic deterioration and progression from type 1 (mild) to type 4 (severe) disease. Multivariate logistic regression analysis, Kaplan-Meier survival curve analysis, and the Mann-Whitney U test were used to compare data of deceased patients with those of individuals who recovered to identify prognostic radiographic features.

**RESULTS:** Ground-glass opacity was the most common abnormality (66%) followed by consolidation (18%). Overall mortality was 35% (19/55). Mortality was higher in the patient group (55%, 18/33) than in the HCW group (5%, 1/22). The mean chest radiographic score for deceased patients was significantly higher than that for those who recovered ( $13 \pm 2.6$  [SD] vs  $5.8 \pm 5.6$ , respectively;  $p = 0.001$ ); in addition, higher rates of pneumothorax (deceased patients vs patients who recovered, 47% vs 0%;  $p = 0.001$ ), pleural effusion (63% vs 14%;  $p = 0.001$ ), and type 4 radiographic progression (63% vs 6%;  $p = 0.001$ ) were seen in the deceased patients compared with those who recovered. Univariate and logistic regression analyses identified the chest radiographic score as an independent predictor of mortality (odds ratio [OR], 1.38; 95% CI, 1.07-1.77;  $p = 0.01$ ). The number of comorbidities in the patient group ( $n = 33$ ) was significantly higher than that in the HCW group ( $n = 22$ ) (mean number of comorbidities,  $1.90 \pm 1.27$  vs  $0.17 \pm 0.65$ , respectively;  $p = 0.001$ ). The Kaplan-Meier analysis revealed a median survival time of 15 days (95% CI, 4-26 days).

**CONCLUSION:** Ground-glass opacity in a peripheral location was the most common abnormality noted on chest radiographs. A higher chest radiographic score coupled with a high number of medical comorbidities was associated with a poor prognosis and higher mortality in those infected with MERS-CoV. Younger HCWs with few or no comorbidities had a higher survival rate.

S9

### **Containing a Superspreading Event of the MERS-Coronavirus in the Hajj Season.**

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Middle Eastern respiratory syndrome coronavirus (MERS-CoV) has exhibited a superspreading event in recent years. In this work, the effects of such an event is investigated in one of the largest annual mass gatherings: Hajj in Saudi Arabia. Saudi Arabia contains the largest confirmed number of MERS-CoV. Therefore, it is assumed that superspreaders are only from the local population. An extended version of the SIR model is implemented to model the basic reproduction number and final size of the virus. The population is divided into two subpopulations: local and non-local pilgrims. Simulation results indicate that the prevalence of the virus in the local population follows a bell shape; whereas the prevalence in the non-local population persists over time. Three agent based models are implemented to model the effect of surgical masks on the basic reproduction number and the prevalence of the virus in some of the more crowded rituals of Hajj such as Tawaf and Ramy al-Jamarat. Simulation results indicate that the surgical masks are effective in containing the superspreading event and lowering the prevalence of the virus.

## S10

**Sero-prevalence of vaccine-preventable diseases among Medical Students in the United Arab Emirates**

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**BACKGROUND:** The aims of this study were to assess the seroprevalence of vaccine-preventable infections in Emirati medical students, and to provide scientific evidence for implementation of a cost-effective immunization guideline and policy for medical school admission.

**METHODS:** This prospective cohort study involved 261 (61% female) Emirati medical students (preclinical and clinical) attending the College of Medicine and Health Sciences at UAE University. Data on vaccination and history of infectious diseases were collected from participants. Blood samples were collected between July 1, 2011 and May 30, 2012 for serological testing and QuantiFERON®-TB assay.

**RESULTS:** All students tested negative for infection with hepatitis C virus and human immunodeficiency virus. The prevalence of seropositivity to rubella virus was 97%, varicella-zoster virus 88%, mumps virus 84%, measles virus 54%, hepatitis B virus (HBV) 48%, and hepatitis A virus 21%. The QuantiFERON®-TB test was positive in 8% and indeterminate in 2%. Forty percent of students received HBV vaccine at birth; their HBV titers (mean  $\pm$  SD) were  $17.2 \pm 62.9$  mIU/mL (median = 1.64). The remaining 60% received it at school and their titers were  $293.4 \pm 371.0$  mIU/mL (median = 107.7,  $p = 0.000$ ).

**CONCLUSION:** About 50% of students were susceptible to HBV and measles virus; therefore, pre-matriculation screening for antibodies against these viruses is highly recommended. Moreover, tuberculosis screening is necessary because of the high influx of expatriates from endemic areas. Students with inadequate protection should be reimmunized prior to contact with patients.

**Dissemination of *bla*<sub>OXA-181</sub> on IncX3 plasmids in the United Arab Emirates**

Agnes Sonnevend, Dania Darwish, Akela Ghazawi, Shaima Fekry, Rayhan Hashmey, Zulfa AlDeesi, Tibor Pal

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As the horizontal spread of *bla*<sub>NDM-1</sub> and *bla*<sub>KPC-2</sub> carbapenemase genes on IncX3 type plasmids in the United Arab Emirates have been proven by our previous studies, the aim of our current investigation was to assess whether class D carbapenemases also disseminate on the same plasmid type in the country.

We screened 128 OXA-48-like carbapenemase producer *Enterobacteriaceae* isolates, collected in ten hospitals of the UAE in 2009-2014 for the presence of IncX3 type plasmids by PCR, and identified in this collection four *Escherichia coli* from 3 different hospitals and four *Klebsiella pneumoniae* from different wards of the same hospital carrying *bla*<sub>OXA-181</sub> on IncX3 type plasmids. Six isolates were from clinical samples and two from screening. The four *K. pneumoniae* were indistinguishable by PFGE. Three *E. coli* isolated from different hospitals belonged to ST410, while one from a fourth hospital represented ST176. All isolates were multi-drug resistant and besides the OXA-carbapenemase carried the *qnrS1* gene. All *E. coli* ST410 isolates carried *bla*<sub>CMY-2</sub> and *bla*<sub>CTX-M-15</sub>, as well. Whole plasmid sequencing of pOXA-181 from the four *E. coli* and one representative of the clonally related *K. pneumoniae* isolates revealed that all of them were 99-100% similar to each other and to the pOXA181 plasmid of *E. coli* ST410 WCHEC14828, recently described from China.

**CONCLUSIONS:** Our data show that IncX3 plasmids carrying *bla*<sub>OXA-181</sub>, previously described in China, only, are wide-spread in the UAE as they were encountered, with nearly identical sequences, in different hospitals, in different species and in different sequences types of *E. coli*. Further investigations should reveal whether there are any epidemiological connections between China and the UAE that could explain the similarities between carbapenemase carrying plasmids encountered in these two distinct geographical areas.

S12

**Plasmid-mediated colistin resistance in the Arabian Peninsula**

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The fast emergence and spread of resistance to carbapenems forced us to re-introduce the use of polymyxin type antibiotics, once considered too toxic for routine parenteral application, to treat life-threatening Gram negative infections. Until very recently resistance against these drugs were considered to be caused exclusively by various chromosomal mutations. The description of a plasmid containing the *mcr-1* gene coding for colistin resistance in China in November 2015 caused global concerns as this made the horizontal spread of this resistance gene possible.

Among the 75 colistin resistant *Enterobacteriaceae* strains collected from Bahrain, Kuwait, Oman, Saudi Arabia and from the UAE we identified four *E. coli* strains (two from Bahrain, and one from the KSA and UAE, respectively) carrying plasmids containing the *mcr-1* gene. They belonged to global multidrug resistant *E. coli* clones, i.e. ST648, ST224, ST68 and ST131, respectively. One strain carried the *bla*<sub>NDM-1</sub> carbapenemase gene. The *mcr-1*-containing plasmids were transferred to suitable recipients and sequenced. Three strains carried *mcr-1* on IncI2 type plasmids, one of them also harbouring an extended spectrum beta-lactamase *bla*<sub>CTX-M-64</sub> gene. In the fourth strain *mcr-1* was located on a 240 kb IncHI2 plasmid co-harboring 13 other resistance genes. This is the first report on the presence of plasmids carrying the *mcr-1* gene from the Arabian Peninsula. Their presence in multi-resistance strains, and in particular the fact that in some of them multiple resistance genes are co-located with *mcr-1* is alarming, as it raises the possibility that the use of a variety of antibiotics could facilitate the spread of resistance to colistin, i.e. the very last resort drug against Gram negative pathogens.



### **Cognitive Behavioral Therapy in confined environments in an Arab Country: Case Study Reports**

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Cognitive Behavioral Therapy (CBT) is the more commonly used approach with regards to psychological treatment, for a number of psychological disorders, including Post-traumatic Stress Disorder (PTSD). The current case studies reports discuss the efficacy of CBT when applied in a confined environment (an inpatient, rehabilitation facility) while considering the possible contribution of cultural responsiveness to treatment outcomes in a considerably conservative culture. Three adult male patients in a rehabilitation center with PTSD were treated using CBT. The patients' scores in GAD 7, PHQ9 and IES-R were noticeably reduced, and patients were relieved from PTSD symptoms. Being in a confined environment, key elements of CBT such as the use of in vivo exposure and recording sessions were not possible in the treatment, however, realistic and achievable goals set jointly by the clinician and the patients at the beginning of therapy were realized. Patients applied learned skills in their daily life in the facility. Follow up after the patients were released from the facility was possible with one patient only. However, the limited follow up after he was released, makes it difficult to know if he had maintained these skills. In this report, we discuss the adaptation that were made, the obstacles, and the feasibility of applying CBT in confined environments.

S14

**Aircraft noise around Abu Dhabi International Airport and its impact on local community and workers health**

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The aim of this study is to investigate the impact of aircraft noise pollution on community health near Abu Dhabi International Airport. In addition, the paper evaluates the impact of aircraft noise pollution on exposed individuals in working place near the Airport. This study was conducted in residential neighborhoods and employment areas near the airport with high exposure to aircraft noise and in a matched control areas far from the airport and are unaffected by aircraft noise. Multinomial Logit Model was used to determine the impact of aircraft noise on community and workers health. After controlling for confounders, the health of the residents adjacent to the airport who have been chronically exposed to high aircraft noise level are found to be worse than the control group. Residents from the noise exposure area have a high level of noise stress, hypertension, headache, general disturbance, loss of sleep/insomnia, and hearing problems than the matched control area. On the other hand, the results show that aircraft noise pollution near Abu Dhabi Airport has no negative impact on the employees working in places adjacent to the airport.

### **Rising temperatures and the impacts of climate change on environmental health in the Tropics**

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Climatic warming may indeed be a global phenomenon, but the temperature changes differ markedly between different regions of the Earth. Temperature increases in the Tropics are much smaller than temperature increases in higher northern latitudes, and so far just a tiny fraction of global research effort has been focused on the impacts of rising tropical temperatures. Despite receiving so little attention, we here consider whether small amounts of warming in regions which are already very hot may actually have much more negative effects than larger amounts of warming in regions which are still relatively cold. We compile the results of 48 studies conducted in various parts of the world, and demonstrate that in the mid- and higher latitudes, vital rates such as survival and fertility actually tend to increase rather than decrease as temperatures rise. In a series of laboratory studies, we then demonstrate that temperatures in various parts of tropical Asia and Africa commonly lie above the temperatures which optimise physiological performance. Overall, our studies demonstrate that rising tropical temperatures tend to have negative effects while rising temperatures in cooler higher latitude regions tend to have positive effects. Temperature may be rising by less in the Tropics, but these regions are already too hot and the impacts of climate change may actually be much more negative.

S16

**Lethal temperatures – surviving climate change in the United Arab Emirates**

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The magnitude of climatic warming in the Tropics is much smaller than in more northerly regions, so the impacts have often been assumed to be minor, and relatively little attention has been focused on these regions. It has been estimated that tropical regions have received less than 1% of all research into climate change impacts, but despite this neglect, there are coherent arguments as to why the impacts could actually be much more negative. Physiological performance increases with temperature when it is too cold, decreases with temperature when it is too hot, and displays a catastrophic terminal collapse when temperatures reach the Upper Critical Temperature,  $T_{cmax}$ , where death occurs. These Upper Critical Temperatures have been measured in a wide range of model organisms, and here we compiled these estimates to examine how many of these species would be able to survive the sustained maximum temperatures which are/will become typical of the United Arab Emirates. Of the 357 species studied, only 9 would be able to survive sustained maximum temperatures of 48°C. Were temperatures to rise by a further 3°C to 51°C, then only one of these species would remain alive. Temperatures here have already reached levels which are lethal to the physiology of most organisms, and even quite small temperature increases could cause catastrophic mortality among most of the rest.

S17

**The metabolic sensor Pask regulates metabolism through Histone modification**

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Adverse early developmental conditions alter the expression of the metabolic sensor, Per-Arnt-Sim (Pas) domain-containing serine/threonine kinase (Pask) which has been involved in insulin secretion and lipid metabolism, but the mechanism by which it maintains its metabolic sensor function is unknown. We demonstrate here that Pask is expressed in the cytoplasm and nucleus of satellite muscle cells. Using *in silico* methods, we have identified WD40-repeat protein (Wdr5), a major H3K4-methyl-associated protein as a binding partner of Pask. By means of co-immunoprecipitation and western blot analyses we show that Pask is a member of the H3K4 methyltransferase complex and that it promotes H3K4 di- and tri-methylation suggesting that Pask might be exerting its metabolic regulatory role through histone modification. Taken together, the data presented in this report reveal a molecular epigenetic mechanism by which Pask probably regulates metabolism.

S18

**Epstein-Barr Virus Small RNAs (EBERs) Play a Role in Providing Resistance to Cells from Apoptosis.**

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**INTRODUCTION:** EBV is a large dsDNA lymphotropic virus latently carried by most of the human population. The virus has oncogenic properties and is implicated in the pathogenesis of several malignancies. Depending on the pattern of EBV latency, infected cells express different latent gene products. Epstein-Barr encoded RNAs (EBER1 and EBER2) are non-polyadenylated and non-protein coding small RNA molecules that are highly expressed (>10<sup>6</sup> copies per cell) in all EBV infected cells and all forms of EBV latencies. However, the function or role of these small RNAs in the biology of EBV remains unclear. In this study, we examined the role of EBER1 in inhibiting apoptosis and the potential molecular pathway(s) involved.

**METHODS:** EBER1 expression plasmid was stably transfected into 293T cells using calcium phosphate method. EBER1 expression at the cellular level was detected using EBER *in situ* hybridization and standard PCR. The level of cell proliferation and apoptosis was determined using MTT and Promega Glo assays. Low density microarray was used to determine the expression profile of various apoptosis-related genes. Real-time RT-PCR was carried out to quantify the expression levels of some of the candidate genes.

**RESULTS:** EBER1 was seen to be present in the nucleus of EBER1 transfected cells, though at lower levels compared to EBV infected cells. To investigate the impact of EBER1 on expression of apoptosis-related genes, we found some remarkable differences between EBER1 transfected and mock-plasmid transfected cells. EBER1 transfected cells showed increased expression of several genes coding for proteins associated with inhibition of apoptosis. Furthermore, EBER1 transfected cells were found to be resistant to Fas ligand-induced apoptosis compared to mock-plasmid transfected cells. This observation also correlated with the levels of activated caspase 3/7 in EBER1 transfected cells.

**CONCLUSIONS:** These data suggests that EBER1 may play a role in inhibiting the extrinsic pathway of apoptosis. In EBER1 transfected cells, the early trigger to induce apoptosis is active, but the expression of downstream executory components such as caspase 3 is inhibited. This inhibition could be due to the interaction of EBER1 with PKR, leading to the inhibition of downstream executioner pathways.

## Role of Muc1 in regulating b-catenin signaling after moderate and severe ischemic kidney injury

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**BACKGROUND:** The HIF-1 and b-catenin protective pathways represent two key cellular responses that are activated during acute kidney injury (AKI). We previously reported that mouse mucin-1 (Muc1), found on the apical surface of normal kidney epithelia, plays a protective role in a mouse model of ischemia-reperfusion injury (IRI) by comparing kidney function and morphology in Muc1 KO mice and congenic control mice (AJP-Renal 2015). We also found that Muc1 (i) stabilizes b-catenin levels after moderate ischemia, (ii) enhances its nuclear translocation, and (iii) increases its downstream signaling (AJP-Renal 2016). However, others have shown that while moderate ischemia resulted in transient induction of b-catenin levels and recovery of kidney function, severe ischemia led to sustained activation of the b-catenin pathway and development of kidney fibrosis, implicating duration of ischemia as a key determinant of the long term outcome. This compelling preliminary data led us to hypothesize that Muc1 modulates normal and aberrant b-catenin signaling during both moderate and severe kidney ischemia-reperfusion injury, respectively.

**METHODS:** Muc1 KO and congenic C57BL/6 male mice were subjected to moderate or severe IRI using bilateral renal pedicle clamping model.

**RESULTS:** We observed a significant and sustained increase in both Muc1 (7-fold) and b-catenin (24-fold) in mouse kidney homogenates at 7 d after severe ischemia. We also found that sustained induction of Muc1/b-catenin was associated with some epithelial-to-mesenchymal transition (EMT) features: a significant 10-fold increase in vimentin levels, a mesenchymal marker, and a significant 63% reduction of E-cadherin, an epithelial marker. Moreover, we observed a significant 1.8-fold increase in levels of phosphorylated p53, a tumor suppressor that induces cell cycle arrest by upregulating p21 transcription, which in turn mediates kidney fibrosis.

**CONCLUSIONS:** In this context, it seems that the b-catenin pathway acts as a “double-edge sword” in the injured kidney. An early and transient activation of b-catenin pathway appears to be renoprotective by promoting repair and recovery of kidney function after AKI, while sustained activation of the same axis promotes renal interstitial fibrosis and accelerate AKI to CKD progression.

S20

### **The Major Packaging Determinant of MMTV Genomic RNA Resides in a Bifurcated Stem Loop 4 (SL4) Containing Dimerization Initiation Site and Single-Stranded Purines**

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Our previous deletion analysis of the 5' end of the MMTV genome has suggested that the entire 5' untranslated region (UTR) in conjunction with the first 120 nucleotides of Gag are critical for MMTV gRNA packaging. Further selective 2'hydroxyl acylation primer extension (SHAPE) analysis of this region has revealed that the RNA secondary structure of this region folds into several stable stem loops (SLs) and palindromic (pal) sequence(s). Among these, the bifurcated stem loop 4 (SL4) has recently been shown to play an important role in both RNA dimerization and packaging. Specifically, it contains two loops: pal II (the dimerization initiation site; DIS) and single stranded purines (ssPurines) in close vicinity to each other. This proximity of the two structural elements may potentiate/facilitate nucleocapsid binding during RNA encapsidation into the budding virion. Given the fact that SL4 contains DIS as well as ssPurines, both of which augment MMTV RNA dimerization and packaging, it is plausible to suggest that sequences comprising SL4 constitute the major packaging determinant of MMTV gRNA at the structural level.

To test this hypothesis, we individually deleted the DIS and ssPurines which showed deleterious effects on both gRNA packaging and propagation. To further investigate the structural basis of RNA packaging and the role of sequences involved in forming SL4, we employed a strategy to destabilize the stems and recreate them by introducing compensatory mutations on the other side of the stem. Our preliminary results suggest that stem-destabilizing mutations abrogate RNA packaging and propagation, while compensatory mutations re-establishing them restored RNA packaging and propagation to wild type levels. The structure of this stem looked similar to the wild type one; however, differed in its primary sequence. To establish structure-functional relationship, RNA sequences of these mutants were folded using MFold which predicted that both the ssPurines and DIS got base paired with other sequences in the destabilizing mutations, while compensatory mutations restored the stem structure of SL4, and the ssPurines and DIS re-acquired the native single-stranded loop structures. These results confirm that SL4 constitutes the major packaging determinant of MMTV gRNA at the structural level.



S21

***Rhus coriaria* inhibit migration, metastasis and tumor growth of breast cancer**

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We have previously reported that *Rhus coriaria* exhibits anticancer activities by promoting cell cycle arrest and autophagic cell death of the metastatic triple negative MDA-MB-231 breast cancer cells. Here, we investigated the effect of *R. coriaria* on the migration, invasion, metastasis and tumor growth of TNBC cells. Our study revealed that non-cytotoxic concentrations of *R. coriaria* significantly inhibited the migration and invasion, blocked adhesion to fibronectin and downregulated MMP-9 and prostaglandin E<sub>2</sub> (PGE<sub>2</sub>). Not only did *Rhus coriaria* decrease their adhesion to HUVECs and to lung microvascular endothelial (HMVEC-L) cells, but it also inhibited the transendothelial migration of MDA-MB-231 cells through TNF- $\alpha$ -activated HUVECs. Furthermore, we found that *R. coriaria* reduced VEGF production in both MDA-MB-231 and HUVECs and downregulated the inflammatory cytokines TNF- $\alpha$ , IL-6 and IL-8. The underlying mechanism for *R. coriaria* effects appears to be through inhibiting NF $\kappa$ B, STAT3 and Nitric Oxide (NO) pathways. Most importantly, by using chick embryo tumor growth assay, we showed that *R. coriaria* suppressed tumor growth and metastasis *in vivo*. The results described in the present study identify *Rhus coriaria* as a promising chemopreventive and therapeutic candidate that modulate triple negative breast cancer growth and metastasis.

S22

### **Identification and Characterization of the Anticancer Potential of Indigenous Medicinal Plants of the Arabian Peninsula**

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The current study was undertaken to study the anticancer properties of five indigenous medicinal plants. Towards this end, 32 different extracts were tested, while essential oil from *Boswellia sacra* was used as a control as well as to expand upon its anticancer activity profile. Initially, the extracts were screened for their effect on cell viability in two different human cancer cell lines, MCF-7 and HeLa, to ensure that their anticancer potential was not missed. Once all the extracts had been screened, a select group were chosen from each plant for a more in-depth analysis in a full panel of human breast cancer cell lines (MCF-7 and MDA-MB-231) and their normal counterpart (MCF-10A) as well as the human cervical cancer cell line, HeLa. Finally, a few isolated compounds and their derivatives from these extracts were also screened for the same activities. Test of the extracts revealed that some of the extracts exhibited anti-proliferative activity against the targeted cancer cell lines in a cell line-dependent manner. Test of the activity of different caspase enzymes revealed that the effective extracts could induce apoptosis. Western blotting was used to confirm the role of various caspases in the activation of apoptosis. Screening of isolated compounds from these extracts and their derivatives revealed that one of the isolated compound showed promising anti-proliferative activity and could induce a specific caspase, suggesting activation of caspase-dependent apoptosis. Thus, analyses from these multi-pronged approaches have resulted in the identification and characterization of extracts having anticancer potential from five indigenous medicinal plant species. We are further characterizing their mechanism(s) of action as well as exploring other cell death pathways that may be induced. Overall, our results demonstrate that traditional medicinal plants can provide an excellent source of natural raw material to isolate novel anticancer agents, enlarging the arsenal of new molecules available to fight cancer.

S23

**Parathyroid hormone-like hormone (pthlh):  
a novel stomach growth factor**

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Parietal cells play a fundamental role in stomach physiology, not only by creating a pathogen free environment through the production of gastric acid, but also by secreting essential growth factors thought to be important for cellular homeostasis of the gastric glands. Gastrin is known to be a critical regulator of parietal cell function as well as proliferation and differentiation of the gastric glands. High gastrin levels are frequently associated with gastric hyperplasia, yet the mechanism has not been defined. Since parietal cells express gastrin receptors, one hypothesis is that the proliferation effect of hypergastrinemia is due to gastrin stimulation of growth factor(s) production by parietal cells. Although Pthlh is widely expressed in different tissues and has been found to orchestrate key cellular events, such as cell proliferation and differentiation; its normal expression, function and regulation in the stomach is unknown. In my presentation, I will summarize the physiological importance of Pthlh in the mouse stomach homeostasis using mouse models and gastric cell lines. Our data suggested that Pthlh is expressed by the acid secreting parietal cell. Additionally, *in vivo* and *in vitro* studies suggested that gastrin is a physiologic regulator of Pthlh gene in the stomach. In conclusion, this project has identified Pthlh as a novel parietal cell growth factor and shed some light on its role as a mediator of gastrin growth factor activity in gastric homeostasis.

S24

**Generation of stomach spheroids using mouse gastric stem cells****Shakila Afroz, Prashanth Saseedharan, Sherif Karam***Department of Anatomy, College of Medicine & Health Sciences, UAEU*

The stem cells are becoming a powerful tool in biomedical research such as disease modeling, drug testing and tissue engineering for regenerative medicine. However, isolating stem cells from organs and maintaining them to differentiate are challenging tasks. To overcome this problem, our group has recently established an epithelial cell line with molecular and morphological features representative of the mouse gastric stem (mGS) cells. The aim of this ongoing study is to develop three-dimensional culture models of these mGS cells to enhance their capacity to differentiate. We started with the simple hanging drop method. The cells were grown at different densities in 20  $\mu$ l drops of RPMI culture media containing 10% serum without any additional growth factors. The cells were examined daily and the media was changed every three days. Microscopic examinations indicated that within a few days, the cells were connected and formed a small spherical structure. These spheroids grew larger in size when transferred onto agarose-coated 96-well plate. Spheroids will be further characterized by using immunohistochemistry, electron microscopy to detect any evidences of differentiation into gastric epithelial cell lineages. This will be also confirmed by quantitative RT-PCR using gastric cell lineage-specific primers. Furthermore, future plan of our study includes testing the ability of these spheroids to form organoids in transplantation studies. In conclusion, this study will provide some basis for the development of therapeutic applications of stem cells in regenerative medicine.

S25

### **Toys or dangerous product? - Women's awareness, attitude and practice regarding baby walker use – An interventional study**

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**INTRODUCTION:** Baby walkers (BWs) are a consumer product frequently associated with infant injuries. Although they are banned in Canada, in the UAE they are perceived safe and used by many families. Little research was reported from the Middle East assessing effectiveness of interventions to reduce BW use.

**METHODS:** We interviewed women in the grade 5 to 12 in Family development foundation in Al Ain. We used a structured self-administered questionnaire before and immediately after educational intervention and phone interview after one year. Data were doubly entered to Excel and analysed with SPSS.

**RESULTS:** Total sample was 339 females, 79% (n=263) were Emirati citizens. Before intervention 83% (n=289) of families used/had used BWs. 89% used BW because they thought it helps the baby walk earlier, 69% believed it is safe. 259 children were injured by BWs, 57 were treated in ER and 13 admitted to hospital. 24% stopped to use them because of injury. Immediately after intervention a belief that BW are dangerous rose from 20% to 50%, yet only 38% strongly agreed that BW should be banned. 89% claimed intention to stop using BWs. One year after intervention 17% of families still used BWs, 69 injuries occurred and 1 death was reported. From those who stopped to use BWs, 19% gave it as gift, 5% to charity.

**CONCLUSIONS:** Educational intervention to change use of BWs was not efficient. Governments should consider prohibiting sales together with public education on risks and replacement by stationary activity centres.

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S26

### Primary Health Care Challenges and the Chronic Care Model in the Emirate of Abu Dhabi, United Arab Emirates

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**INTRODUCTION AND OBJECTIVE:** Abu Dhabi is the capital of the United Arab Emirates (UAE) and the largest emirate in terms of land mass and population. This emirate has three different geographical regions: Abu Dhabi (Central Capital District), Al Ain (Eastern Region), and Al Gharbia (Western region). Since 2007, the health system has been regulated by the Health Authority – Abu Dhabi (HAAD) and the Abu Dhabi Health Services Company (SEHA) has been the service provider in all governmental health facilities. The UAE has a high population-burden of morbidity and mortality related to non-communicable chronic diseases (NCD). The Chronic Care Model (CCM) and the Patient-Centered Model Homes (PCMH) are frameworks for improving chronic illness care at the individual and population level. The aim of this paper was to characterize primary health care (PHC) centers in Abu Dhabi and to analyze whether their goals are aligned with the CCM.

**METHOD:** Official published data from HAAD, SEHA, and the UAE Ministry of Health was analyzed using CCM as a framework to assess the PHC services and to identify potential opportunities for improvement.

**RESULTS:** There are 38 SEHA Ambulatory Healthcare Services (AHS) Centers that provide Primary Health Care (PHC) with 20 located in the Eastern Region and 18 in the Central Capital District. SEHA adopted the PCMH principles that have the same base of care as the CCM. Specifically, the PCMH purposes that team-based care can enhance the support and health outcomes of individuals with NCDs. However, it is integral to fully implement team-based care to move to the CCM and to become a PCMH. The implementation of the CCM elements aligns with PCMH standards and is positively associated with the use of interventions targeting major NCD risk behaviors. The CCM also has beneficial effects on clinical outcomes and processes of care and should continue to inform systematic efforts to improve care.

**CONCLUSIONS:** The Abu Dhabi emirate health system is internationally well-positioned and performing well when benchmarked against developed countries. The adoption of the PCMH was undoubtedly a strategic choice and the model seems to be aligned with the CCM.

**KEYWORDS:** Health Systems Plans; Primary Health Care; Chronic Care Model; United Arab Emirates; Abu Dhabi Emirate.

S27

### **Antioxidant properties in vitro and after acute ingestion in human of a newly developed functional date seed powder bread**

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**BACKGROUND:** In vitro antioxidant properties have been demonstrated for date seeds. Knowing the role of oxidative stress in the development of chronic diseases, including cardiovascular diseases and cancer, date seeds represent a promising candidate for the development of functional food to reduce the risk of these diseases. Arabic bread, which is wheat flour-based, is a major staple food in the Arab World and a higher antioxidant content has been observed in date seed powder compared to wheat and whole wheat flour.

**OBJECTIVES:** to characterize the antioxidant property of a newly developed date seed powder bread and study its potential effect after acute oral ingestion in human.

**METHOD:** Previously developed date seed powder bread (5, 10, 15 and 20% date seed powder) were considered with regular and whole wheat Arabic breads as controls. Nutritional composition, total flavonoids, total phenolics and antioxidant capacity were determined in each bread. The antioxidant impact of date seed bread in human was tested by providing date seed bread (10% and 15%, 5 loaves) to 16 (8 men and 8 women) healthy adults.

**RESULTS:** Nutritional properties were similar among controls, 5%, 10%, and 15% date seed powder (DSP) bread. Bread with 20% date seed powder had significantly higher amounts of fiber and fat compared to others. Total flavonoids and antioxidant capacity increased in DSP bread in a dose-dependent manner. A significantly higher content of total flavonoids was observed in 10%, 15%, and 20% DSP bread compared to controls. Antioxidant capacity was significantly higher in DSP bread compared to controls, even at 5%.

The consumption of DSP bread was confirmed to be safe in human. Besides, after oral ingestion in human, a decrease of oxidative damages on protein was observed with 10% date seed bread, in male.

**CONCLUSION:** DSP bread exhibits higher levels of flavonoids and antioxidant capacity compared to regular and whole wheat breads. Besides, these preliminary results indicate that DSP bread could contribute to protect against oxidative stress damages in human.

This research project was supported by the UAEU Center-based interdisciplinary research grant, 2013.

S28

**Estimation of relative impact of modifiable lifestyle factors in diabetes mellitus**

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**INCRODUCTION:** Lifestyle modifications such as improving diet and physical activity are considered the cornerstone of diabetes management. As part of our research project on developing a behaviorally-oriented questionnaire, the Diabetes Score, we sought to find out the relative importance of different lifestyle factors on patient outcomes.

**METHODS:** This study was a component of the ongoing Diabetes Score project, which has been reviewed and approved by the regional human subjects research ethics committee. We conducted a literature search via PubMed MEDLINE and Google Scholar search engines using the keywords “lifestyle factors in diabetes” without limits on language or date of publication. Search results were reviewed for relevant studies and additional articles were retrieved using adaptive searching through the ‘Related articles’ feature. Articles that addressed the absolute or relative attributable effect of lifestyle factors on diabetes outcomes were selected.

**RESULTS:** We could not retrieve any published article that attempted to assign relative weights to different lifestyle factors in improving diabetes care. A 2009 metaanalysis examined the risk of developing diabetes among at-risk persons in Finland, the population attributable fractions were respectively: being overweight 77%, lack of exercise 5%, alcohol consumption 3%, smoking 10%, and vitamin D deficiency 11% [1]. Social and work stress appears play a role in the lives of patients with diabetes and a social support network may be clinically protective [2]. Group interventions as opposed to individual patient counseling appear to be effective in ensuring weight loss and improving glycemic control [3]. A 2013 systematic review of clinical trials of lifestyle intervention in diabetes found insufficient evidence to show improvements in all-cause mortality or cardiovascular outcomes [4]. Given the lack of strong evidence to separate the individual effects of various lifestyle factors, an attempt at estimation of relative weights was made using lower quality evidence from observational studies.

**CONCLUSION:** We developed estimations of relative contributions of lifestyle factors in improving diabetes outcomes based on low quality clinical evidence. These attributable fractions could guide patient care and counseling interventions in diabetes management.



## Children and Adolescents Online BMI Calculator

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**INTRODUCTION:** While the method for calculating adult Body Mass Index (BMI) is known and simple (BMI = Weight in kg / squared height in meters), there are several, more complicated methods for calculating child and adolescent BMI. Three of these methods are known and used, Centers for Disease Control (CDC), International Obesity Task Force (IOTF) and World Health Organization (WHO) methods. Calculations for these methods involve spreadsheets and multiple calculation steps. Also, the result is not a BMI number but rather a centile range. While these three organizations provide websites on the methodology of how to perform the calculations, they don't provide a simple interface where one can enter the necessary values and retrieve a result. There is certainly no one website that provides results using all three methods.

**METHODS:** A first-of-its-kind website was developed to provide results using all three methods as well as the standard adult BMI method by entering the necessary values using a simple interface. The system uses the ASP web programming language and MS SQL server as the relational database storing the data. Several spreadsheets retrieved from the organizations' websites were stored in the database to allow performing the necessary calculations.

**RESULTS:** The system was used for the past two years by specific researchers interested in this area and is ready to be launched globally. The interface requires the entry of four values, Gender, Age, Height and Weight and will provide the results of all three methods immediately. Figure 1 shows the website homepage where the user can enter the four required values. Figure 2 shows the results page displaying the Centile and BMI Classification for the entered values.

**CONCLUSION:** It is possible to develop an online tool that combines the three most common methods for calculating child and adolescent BMI. Such a tool can be a valuable resource for the public as well as researchers and physicians interested in the subject. The link to the online tool is: <http://cmhsweb.uaeu.ac.ac/ChildBMICalculator>

S30

### Development of an On-line Lifestyle Intervention for Overweight and Obese University Students in the United Arab Emirates

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**INTRODUCTION:** Nutrition Behaviors of university students may not meet current nutrition recommendations due to changes associated with busy schedules, unhealthy eating patterns and in some cases, moving away from home. Nutrition interventions delivered via advanced information and communication technologies (CIT), such as websites and smartphone applications may find particular relevance for young adults.

**OBJECTIVE:** To develop a lifestyle intervention based on an on-line platform through a website and smartphone applications to improve diet and physical activity behaviors and promote weight loss among overweight and overweight/obese university female students.

**METHODS:** The development of an on-line lifestyle intervention (Rashakaty Program) was guided by the Social Cognitive Theory and employs strategies such as self-monitoring, goal setting, and social support to facilitate behavior changes. Features of the platform are comprised of: collection of diet and physical activity behavior data; tracking of diet and physical activity; sharing of educational materials; provision of an on-line support; and sharing of news and challenges with the participants. The program is designed for implementation in two major universities in the UAE (Intervention and Control).

**RESULTS:** Two smartphone applications were identified to track diet (MyNetDiary) and physical activity (PACER). Educational materials and on-line questionnaires to assess Nutrition knowledge, physical activity, and health beliefs related to diet and physical activity were developed. A website "Rashakaty.com", was created to integrate all the components of the intervention viz: Tabs "Questionnaires", "Educational Materials", "Get Ready" (where the apps for diet and physical activity tracking are introduced), "Fitness+" (where the participants can enter physical activity results). A forum is offered to allow discussion between participants and dietitian. Students from the intervention university will have access to all the tabs in the website plus the two mobile applications. Those in the control university will be given access to the questionnaires and educational material tabs only.

**CONCLUSION:** Rashakaty Program provides an innovative environment to promote weight loss among overweight/obese university female students. It could serve as an important guide in the development and implementation of future technology mediated health promotion programs in the country.

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S31

### **Big Health Data Capabilities and Challenges**

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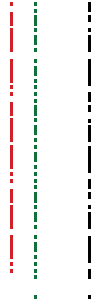
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Insights learned from human health can lead to lifesaving decisions. Big Data health insight has the potential to improve or enhance the life of patients as well as healthcare providers. With the explosive growth of healthcare data, which is currently in silos - disparate and disconnected, there is a need for connecting it with a scalable computing architecture. In addition, handling Big health Data recommends maintaining the highest standards of security to protect the privacy and confidentiality of sensitive medical data. This paper proposes architecture for Big Health Data, as well as evaluates the capabilities and the challenges of Big Data in healthcare industry.

S32

**Prototyping of Microfluidic Devices for Cell Sorting and Other Biological Analyses.****Mohammed Ziauddin***Department of Mechanical Engineering, College of Engineering, UAEU*

Microfluidics devices are used widely for application of many biological analyses such as in cell sorting, cell capturing, and cell culture. A significant enhancement in the production process can allow more modification possibilities of the Microfluidic Devices according to the application needed and the experimental protocol. Therefore, there has been progress in the production of Micro Total Analysis System ( $\mu$ TAS). The technologies of production have been also improving with time. Preparation of microchip separation experiments is a challenge because it is the sophisticated and delicate processes. As the technology is moving forward, more controlled production of microstructures is observed. Henceforth, our research emphasizes on developing a technique that is capable of prototyping complex designs of microstructures as required for various applications in the biological analysis. Maskless Direct Laser Writing Method is used for rapid prototyping of patterns of potential interest of the research. Our system produces patterns from the photoresist material like SU-8, and which can be further used as a mold for the preparation of Microfluidic Devices made up of Polydimethylsiloxane (PDMS) and therefore, facilitating easy fabrication. As the experimental requirements vary from one research to another, our system is capable of producing any type of design with good repeatability. Cheap and fast production of microstructures can enhance the process of research and help researchers put their innovative modifications to the design based on their experimental observation in order to produce better output from the used Microfluidic Device.



***POSTERS' ABSTRACTS***

P1

## **Fronodoside A Up-Regulates the NFκB Pathway and Potentiates the Effects of Conventional Therapeutic Agents in Acute Leukemia**

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**INTRODUCTION:** Acute leukemia is a very common malignancy but despite advances in treatment options, patients still die of the disease or the treatment consequences. Anti-cancer drugs derived from natural products are of interest due to the lower rate of side effects. Fronodoside A, a triterpenoid glycoside from the Atlantic sea cucumber, *Cucumaria frondosa*, has potent anti-cancer effects in solid tumors but its effect on malignant blast cells is yet to be explored.

**METHODS:** In this study, the effect of frondoside A on viability (CellTiter-Glo luminescence assay) and expression of apoptosis-related genes (low-density expression array) was investigated in two acute leukemia cell lines.

**RESULTS:** Fronodoside A markedly potentiates the effect of conventional chemotherapeutic drugs (asparaginase, Vincristine and Prednisolone) when given in combination in the acute T-cell leukemia cell line (CCRF-CEM) and the acute monocytic leukemia cells (THP-1). Analysis of the effect of frondoside A on expression of apoptosis-related genes showed marked changes in multiple pro- and anti-apoptotic genes. Expression of some genes coding for both pro-apoptosis and anti-apoptosis proteins were increased, suggesting that a survival pathway was also activated in the frondoside A-treated cells. Interestingly, frondoside A treatment also markedly affected multiple genes in the NFκB pathway with changes being more marked in the THP-1 cell line, which is more resistant to the effects of frondoside A.

**CONCLUSIONS:** Activation of the NFκB pathway may explain the activation of the cell survival pathway and this observation paves the way for a new potential option for the treatment of acute leukemias. Fronodoside A potentiates the anti-cancer effects of all three drugs currently used to treat acute leukemias and it may be a valuable addition to the therapeutic options in these deadly diseases.

## P2

### **Functional alterations in the glomerular filtration barrier in rats infused with angiotensin II**

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**BACKGROUND:** Chronic infusion of angiotensin II leads to progressive hypertension, increase in renal vascular resistance, and decrease in glomerular perfusion. Also increase in intra-renal angiotensin concentration causes podocyte injury, however, the effect of chronic angiotensin infusion on the glomerular perm-selectivity have been less well characterized. In this study we evaluated the changes in the function of the glomerular filtration barrier caused by chronic angiotensin II infusion.

**METHODS:** Male Wistar rats (n = 5) were fitted with an osmotic minipump and angiotensin II was infused for 7 days at 200 ng/kg/min. The glomerular sieving coefficient was measured for polydisperse inert ficoll molecules with a radius of 10–90 Å. Ficoll is a neutral polysaccharide that is not significantly reabsorbed by proximal tubules, which enables its use for determination of the filtrate-to-plasma concentration ratios for a broad spectrum of molecular radii (10–90 Å).

**RESULTS:** The glomerular sieving coefficient for Ficoll was significantly increased in rats following chronic angiotensin II infusion compared to control animals. The sieving coefficient increased 1.6 fold for ficoll-20 Å, two-fold for ficoll-35 Å, six-fold to ficoll-50 Å, and ten-fold for ficoll-70 Å (Figure). According to the two-pore theory, these changes are compatible with an increase in the number of large pores and shunts in the glomerular filtration barrier.

**CONCLUSION:** Angiotensin II infusion severely impairs the glomerular perm-selectivity to cause a ten-fold increase in the urinary leakage of large molecular weight molecules in the size range of IgG and IgM proteins. Podocyte injury would cause such severe alteration in the function of glomerular filtration barrier. Future studies should examine the possibility of reversing such severe impairment of perm-selectivity by antagonizing the action of angiotensin II.

P3

### Thymoquinone, a bioactive component of black cumin, activates tumor suppressor lipid ceramide in human leukemia

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**BACKGROUND AND AIM:** Thymoquinone (TQ), a predominant bioactive constituent present in black seed (*Nigella sativa*), exerts wide spectrum of biological activities. The seeds of *Nigella sativa* and its oil have been widely used for the treatment of various ailments throughout the world. Among Muslims, it is considered as a one of the greatest forms of herbs available because it was referred by the Prophet Mohammed (peace and blessings be upon him) as having healing power for every illness except death. TQ has been shown to induce apoptotic cell death in leukemic cell lines as well as in blood cells of leukemic patients. However, the mechanisms of action of TQ are unknown. Ceramide (Cer) has been suggested to be a “tumor suppressor lipid” and is able to exert potent growth suppressive effect in a variety of cell types. Caspases are a family of cysteine-dependent aspartate directed proteases that play a critical role in the initiation and execution of apoptosis. In this study, we have investigated the effect of anti-leukemic potential of TQ *in vitro*, and we have further examined the molecular mechanisms of TQ-induced apoptosis in human leukemic cells.

**METHODS:** Cell viability was assessed by MTT assay, Apoptosis was assessed by Annexin V/PI staining and caspase activation. Expression of *Poly (ADP-ribose) polymerase* (PARP), caspase-3, -7, -8, and -9 cleavage was assessed by Western blot analysis. Measurement of cellular Cer was done by using high performance liquid chromatography technique.

**RESULTS AND CONCLUSIONS:** TQ has been shown to suppress growth of human leukemic cells via significant up-regulation of the tumor suppressor lipid Cer, which in turn leads to caspase-3 activation, PARP cleavage, and induction of apoptosis. Pre-treatment of leukemic cells with Myriocin and Fumonsin B1, (potent inhibitors of *de novo* ceramide synthesis), abrogates the ceramide generation, caspase activation, PARP cleavage and in turn prevents TQ-induced apoptotic cell death. Taken together, our findings indicate that apoptosis in leukemia cells triggered by TQ is based on the depletion and caspase-dependent ceramide generation. Altogether, these results demonstrate that TQ-induced apoptosis in leukemia cells occurs via significant ceramide generation and subsequent activation of caspase-3 and PARP cleavage.



P4

## Preferential Presence of Epstein-Barr Virus in Multiple Sclerosis Brain

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Multiple sclerosis (MS) is a debilitating disease of the youth. It is characterized by chronic inflammation, demyelination and neurodegeneration of the central nervous system. The aetiology of MS is unknown. A complex interaction between genes and environment is believed to trigger MS development. A substantial body of evidence points to Epstein-Barr virus (MS) as a potential environmental factor in the pathogenesis of multiple sclerosis. However, this remains highly controversial since a number of studies failed to find EBV in MS brain tissues. We therefore aimed to study multiple samples from over 100 formalin preserved brain tissues from MS and non-MS cases for the presence of EBV. After optimizing DNA extraction from formalin preserved tissues for PCR, EBV DNA was detected in 65/ 101 MS and 5/21 non-MS cases. Abundantly expressed EBV encoded small RNAs, EBERs, were targeted using *in situ* hybridization (ISH) to localize EBV in brain white matter and meninges. EBV infected cells were localized in 83% of MS cases compared to 5% non-MS cases. EBV infected cells were seen in both white matter and within inflamed meninges. The preferential presence of EBV in MS cases was supported by two independent techniques suggesting a possible role for the virus in MS. Studies that look at the potential mechanism of EBV involvement in MS are needed.

P5

**Dimethyl fumarate (DMF) Attenuates Diabetes - Induced Retinal Tissue Injury****Rajesh Mohanraj<sup>1</sup>, Kamal Hassan<sup>1,2</sup>, Balaji Venkataraman<sup>1</sup>, Lu Cai<sup>3</sup>**

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DMF is recently approved for the treatment of multiple sclerosis. DMF elicits anti-inflammatory actions via activation of Nrf-2 cascade. However, the DMF effects on mitigating the pathophysiology of diabetic retinopathy (DRP) are hitherto unknown. Hence, we have investigated the retinal cytoprotective effects of DMF, by employing a murine model of DRP. Results showed that Nrf-2 activation and its down-stream targets such as hemeoxygenase-1 (HO-1), thioredoxin reductase 1 (TXNRD1) and glutamate-cysteine ligase modifier (GCLM) expressions were diminished in the diabetic retinas (DR) as determined by western blot assay. Furthermore, increased oxidative stress (elevated NADPH oxidase activity, diminished SOD activity, GSH levels and elevated lipid peroxides accumulation) were noted in the DR. Elevated levels of pro-inflammatory cytokines (TNF alpha, IL-1 beta and MCP-1) and adhesion molecules (ICAM-1 and VCAM-1) were observed in the DR. Next, greater degree of retinal apoptosis was seen in the DR as determined by TUNEL staining, caspase 3 and poly (ADP-ribose) polymerase [PARP] activities. In addition, increased vascular permeability was observed in DR as determined by FITC-dextran perfusion studies. All the above diabetic phenotypic insults to the retina were attenuated upon treatment with DMF. In addition, high glucose [HG] induced superoxide production, NF-kB, RhoA activation, pro-inflammatory cytokines expression and adhesion of THP-1 monocytes to human retinal endothelial cells [HREC] was blunted upon treatment with DMF. Moreover, cytoprotective effects of DMF against HG induced phenotypic changes in HREC and retinal ganglion cell apoptosis were abrogated upon genetic silencing of Nrf-2. In sum, our observations unequivocally demonstrate the retinal cytoprotective effects of DMF in diabetic milieu and it could be repurposed for future clinical utility in the management of diabetic retinopathy.

P6

## Neutropenia in patients treated with adalimumab and methotrexate for Uveitis

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**INTRODUCTION:** Pediatric non-infectious uveitis remains a rare but potentially sight-threatening disease. Available evidence supports the use of methotrexate (MTX) and or TNF- $\alpha$  inhibitors (adalimumab) in the treatment of childhood autoimmune chronic uveitis. Transient neutropenia is reported to develop in up to 16% of cases on TNF- $\alpha$  and cytopenia to occur in 5% to 25% of patients with rheumatoid arthritis who receive long-term therapy with MTX. Bone marrow recovery typically occurs within two weeks after the withdrawal of medication.

**AIMS:** To report a case of drug induced prolonged duration of neutropenia.

**METHODS:** 10-years-old female known for juvenile idiopathic arthritis and bilateral uveitis. Her arthritis has been in complete remission and initially been on methotrexate for active uveitis which was not sufficiently effective in controlling the intraocular inflammation. Hence, adalimumab (Humira) was added which controlled her uveitis.

**RESULTS:** She developed neutropenia and despite withholding the methotrexate and Humira, the neutropenia persistent for almost 6 weeks. During this period her neutropenia was neither improving nor deteriorating. Her uveitis remained in remission under minimal topical steroid application. Patient recovered spontaneously at around 6 weeks post discontinuation of immunosuppressive medications.

**CONCLUSIONS:** Hematological side effect could be transient or life threatening with immunosuppressive medications. Regular monitoring of the white blood cell count is recommended.

P7

 **$\beta$ -Caryophyllene ameliorates oxidative stress and neuroinflammation in rat model of rotenone-induced Parkinson Disease**Shreesh Ojha<sup>1</sup>, Hayate Javed<sup>2</sup>, Sheikh Azimullah<sup>2</sup>, M. Emdadul Haque<sup>2</sup>*Departments of Pharmacology and Therapeutics<sup>1</sup>, Biochemistry<sup>2</sup>, College of Medicine and Health Sciences, United Arab Emirates University, Al Ain, UAE*

Parkinson disease (PD) is the second most common neurodegenerative disorder characterized by loss of dopaminergic neurons in the substantia nigra (SNc) of brain. A large number of studies demonstrate that oxidative stress and inflammation play a critical role in the etiopathogenesis of PD. The current study was undertaken to determine the neuroprotective potential of beta-caryophyllene (BCP), a phytocannabinoid and natural sesquiterpene of wide occurrence. Its recently approval by FDA for use as food additive and flavoring agent encouraged to investigate its medicinal properties. Following the chronic and progressive nature of PD pathogenesis, BCP (50 mg/kg) and rotenone (2.5 mg/kg) were administered to rats for four weeks, as rotenone-induced PD recapitulates human PD pathogenesis. Rotenone challenge caused a significant decrease in activities of antioxidants as evidenced by reduced superoxide dismutase, catalase and reduced glutathione with a concomitant increase in the lipid peroxidation product, malondialdehyde. Rotenone injections also significantly induced pro-inflammatory cytokines; IL-1 $\beta$ , IL-6 and TNF- $\alpha$  and enhanced the expression of inflammatory mediators; cyclooxygenase-2 (COX-2) and inducible nitric oxide synthase (iNOS) in the midbrain. Immunohistochemical studies reveal a significant increase in the expression of ionized calcium binding adaptor molecule-1 (Iba-1) and glial fibrillary acidic protein (GFAP) indicative of microglia activation and astrocyte activation, respectively with loss of dopamine neurons in the SNc following rotenone exposure. However, in our study, treatment with BCP significantly protected the dopaminergic neurons, improved antioxidant enzymes as well as stabilized the activation of Iba-1 and GFAP resulted from the rotenone challenge. BCP also prevented glutathione depletion and inhibited lipid peroxidation along with significant attenuation of the induction of pro-inflammatory cytokines. Further, BCP treatment also attenuated the increased levels of other inflammatory mediators; COX-2 and iNOS. Based on the results of the present study, it is concluded that BCP protects against rotenone-induced neurodegeneration in PD. The neuroprotective effects of BCP, a naturally available phytocannabinoid can be promising for neuroprotection. The neuroprotective potential could be attributed to its potent antioxidant and anti-inflammatory properties.

**ACKNOWLEDGEMENT:** The work has been supported by the grant form Research Grant Committee, College of Medicine and Health Sciences, UAE University.

## Meta-analysis of clinical and preclinical studies comparing the anticancer efficacy of liposomal versus conventional non-liposomal doxorubicin

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**INTRODUCTION:** Liposome-mediated delivery of cytotoxic chemotherapy significantly enhances drug tolerability in patients as compared to the conventional formulation. We performed a meta-analysis of randomized clinical trials that directly compared the efficacy of liposomal cytotoxic chemotherapy versus their equivalent conventional formulation. This was to note if anticancer efficacy was also improved.

**Material AND METHODS:** Using databases such as Web of Science, PubMed, Cochrane registry of clinical trials we identified 14 clinical trials (8 anthracycline, 4 cisplatin, 1 paclitaxel, 1 irinotecan) that met inclusion criteria, with 2589 patients.

**RESULTS AND DISCUSSION:** We found efficacy in patients was not significantly different between liposomal and conventional chemotherapy as assessed by objective response (odds ratio 1.03; 95% confidence interval [CI] 0.82–1.30), overall survival (hazard ratio [HR] 1.05; 95% CI 0.95–1.17), and progression free survival rates (HR 1.01; 95% CI, 0.92–1.11). Pegylated liposomal doxorubicin (PLD) was the most commonly used formulation in these clinical trials, a meta-analysis of twelve preclinical studies compared the efficacy of PLD and conventional doxorubicin in tumor-bearing mice. In contrast with clinical results, animal studies showed significantly increased survival in mice treated with PLD compared to conventional doxorubicin (HR 0.39; 95% CI 0.27–0.56).

**CONCLUSION:** There are several reasons why the pharmacological advantages of carrier-mediated chemotherapy did not translate into enhanced clinical efficacy. These include role of the enhanced permeability and retention (EPR) effect and the tumor microenvironment amongst other reasons. Our study shows full clinical potential of carrier-mediated drugs has yet to be realized and highlights some of the critical knowledge gaps that need to be addressed in order to move the field ahead.

P9

## The Role of Vitamin D Receptors in Gastric Epithelial Homeostasis

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This study aims to investigate the cellular expression pattern as well as the possible role of Vitamin D Receptor (VDR) in normal rodent stomach. Several molecules such as growth factors, mitogens and hormones are involved in directing stem cells between proliferation and differentiation to maintain gastric homeostasis.

Vitamin D plays several biological roles in body tissues, this include cell differentiation, cell proliferation, immune response and calcium homeostasis.

In animal tissues, the active form of vitamin D; 1-25-dihydroxyvitamin D<sub>3</sub> (VD<sub>3</sub>) is mediated by the receptor VDR. VDR is primarily a nuclear receptor which serves as a transcription factor and activates direct target genes. In some cases, VDR is considered a plasma membrane receptor associated with caveolae, which known to initiate a nongenomic response.

Although target tissues of VD<sub>3</sub> in the gastrointestinal tract were identified earlier in intestine, colon and gastric cancer tissues; the real expression and function of the VD<sub>3</sub> in gastric homeostasis is unrevealed.

Immunohistochemistry (IHC) using rat monoclonal anti-Vitamin D Receptor antibody along with Reverse transcription-Polymerase Chain Reaction (RT-PCR) was performed to find the expression of VDR in rodent gastric epithelium.

Our preliminary data showed several cells with positive signal for VDR. This results was in agreement with RT-PCR reaction after analyzing corpus RNA samples using specific VDR primers.

Our future direction will be to identify the gastric cells expressing VDR using co-IHC for differentiation and proliferation gastric cellular markers. This work will not only add value to the field by providing better understanding of how vitamin D signaling is involved in the control of gastric epithelial cell homeostasis; but it will also demonstrate how that is related to some health conditions such as gastric cancer.

P10

### Effect of Semecarpus Anacardium on the Memory of *l*-Monosodium Glutamate Treated Rats

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**INTRODUCTION:** Memory may severely decrease throughout aging & evolution of some CNS degeneration pathologies as well as a consequence of oxidative stress & chronic stress. The development of drug effective for dementia is widely anticipated because of the increase in the elderly population. Dementia has some histological degeneration in brain including hippocampus. Glutamate is a major excitatory neurotransmitter found with the central nervous system. It plays an important role in normal neurological functioning such as fast response to stimuli, cognition, memory, movement, and sensation. However, in excessive levels, glutamate is excitotoxic and has been shown to cause neurological damage. Semecarpus Anacardium (SA) has been widely used in folk medicine in Brazil, India and Africa to treat different conditions, including Arteritis and tumors. In Arab Folk medicine, it was used to improve memory and reduce inflammation, but very few studies had been done to evaluate its neuroprotective effect. In this study, we are testing the neuroprotective property of the herbal extract.

**METHOD:** 24 Wistar male rats were divided into four groups with six animals in each group. Group A was injected with saline and group B was injected with *l*-monosodium glutamate (MSG) at a dose of 4g/kg on alternate days for 10 consecutive days (5 doses) while group C and D orally administered with low and high dose of SA along with MSG respectively. Animals were tested for memory in delayed matching to sample, delayed non-matching to sample & spontaneous alteration. Following that, structural characteristics of hippocampus were studied using H&E staining.

**RESULT:** In treated animals, SA with two different concentrations induced different effects on memory. The correct response rate of behavioral tasks was significantly equal to the control group when low concentration was used. The response rate of behavioral tasks was significantly lower than control group when high dose was used. Histological results also revealed that SA extract protected hippocampal neurons from MSG induced damage.

**CONCLUSION:** Our results suggest that SA has neuroprotective properties on MSG induced degeneration of hippocampal pyramidal neurons.

P11

**Silencing of glucocerebrosidase enzyme in drosophila to study its effect on Parkinson's disease associated protein, synuclein metabolism****Emdadul Haque***Department of Biochemistry, College of Medicine and Health Sciences, UAEU*

Parkinson's disease (PD) is a complex disorder that can be manifested by an array of genetic mutations. In this study we focus on GBA gene that encodes for the lysosomal enzyme, glucocerebrosidase (GBA). It was observed that patients suffering from PD or Lewy body disorders had a high frequency of GBA mutations. Lewy bodies are proteinaceous plaques deposited across the brain, its main constituent is  $\alpha$ -synuclein ( $\alpha$ -syn). Typically  $\alpha$ -syn is a soluble monomeric protein, however, in PD patients' brains,  $\alpha$ -syn is found as dense insoluble aggregates, suggesting its key role in developing PD. This current study aims to establish a connection between the drosophila GBA (dGBA) and human  $\alpha$ -syn (WT, A30P, A53T) in fruit flies. To accomplish our goal, we have generated fly silencing GBA in the presence or absence of human wild type or mutant synuclein. We conducted locomotor assay and found that the severity of their movement was affected in the order of A53T>A30P>WT when GBA is silenced. To further understand these observations on a molecular level, we have performed western blot analysis. We found that the monomeric  $\alpha$ -syn is significantly lower in lysates of flies with GBA-RNAi co-expressed with A53T compared to control and those co-expressing A30P and WT  $\alpha$ -syn in western blot results. We have used several extraction methods for western blot in this study to determine the consistency of these results. We also performed RT-PCR to measure the transcript of synuclein. It is noteworthy to mention that there were no significant differences in the mRNA levels, which might indicate that  $\alpha$ -syn with A53T mutation undergoes a physiological change in the absence of GBA, possibly forming toxic oligomeric species or high molecular aggregates.



P12

### The role of estrogen in mouse gastric stem cell homeostasis

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To maintain cellular homeostasis of the stomach; epithelial lining of the gastric wall continuously fluctuates between cellular proliferation, differentiation, and apoptosis. A key player in this process is the gastric stem cell. Gastric stem cells are located in the isthmus region of the corpus gastric gland and have the potential to proliferate or differentiate. Although several pathways have been identified to regulate stem cell role in several body tissues; little is known about cellular pathways controlling gastric stem cell homeostasis. This project aims to study the role of estrogen signaling on gastric epithelial stem cell using the well-established mouse gastric epithelial progenitor (mGEP) cell line. Our data showed that both estrogen receptor (ER) subunits alpha and beta are expressed in the mGEP cells at mRNA and protein levels. mGEP cells treatment with the famous selective estrogen receptor modulator (SERM) -tamoxifen- decreased the cellular viability in a time and concentration dependent manner. Cell viability was not significantly changed in the estrogen treated cells. By using qualitative reverse transcription polymerase chain reaction (RT-PCR), ER target genes such as insulin-like growth factor 1 receptor (Igf1r), cyclin D1 (Cnd1), and low density lipoprotein receptor (Ldlr) generally showed a concentration dependent decrease of expression when treated with tamoxifen, however, the expression was increased after estrogen treatment. This well-controlled *in vitro* study is essential to understand estrogen signaling impact on gastric stem cell homeostasis especially that the effect of tamoxifen on the stomach of breast cancer patients is not fully studied.

P13

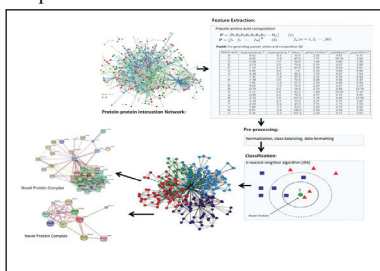
## IBK-AAC: Protein complex detection by integrating pseudo amino acid composition features and IBK classifier

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### 1. INTRODUCTION

Predicting protein complexes from protein-protein interaction network is one of the central problems in the field of bioinformatics as it could be a way to disclose the biochemical functions of proteins. Most of the recently developed methods focus on topological information to detect protein complexes. In this research work, pseudo amino acid composition characterizing protein complexes are extracted and used in conjunction with k-nearest neighbor algorithm (IBK) to detect protein complexes. The proposed method was able to detect 69 complexes out of 81 reference complexes with high accuracy. In comparison with state-of-the-art methods, the evaluation results indicated that the applied method has great potential in detecting protein complexes.



### 2. METHOD

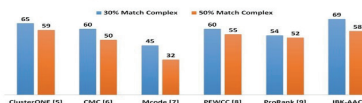
The effectiveness of the proposed method is evaluated using a PPI dataset which was prepared by [1]. The dataset contains 1430 proteins, 6531 interactions, with network density of 0.0 and average number of interactions equal to 9.134. The network contains no isolated nodes and a diameter of 13.

### 3. RESULTS

Table 1: Performance comparison of 7 popular classifiers. IBK achieved higher prediction accuracy.

Classifiers	Sensitivity	Specificity	Accuracy	Running Time (in Sec.)
Libsvm	0.313	0.995	31.27%	40.59
NaiveBayes	0.665	0.989	66.90%	0.57
BayesNet	0.259	0.961	25.96%	0.22
Decision Tree	0.704	0.994	70.45%	0.72
Random-Forest	0.818	0.995	81.79%	0.43
Kstar	0.811	0.996	81.13%	0
IBK	0.818	0.996	81.79%	0

Figure 2: Performance comparison to 5 current methods for protein complex prediction. IBK-AAC accurately predicted more matched complexes (50% and 50% match).



P14

### Effect of long-term diabetes on the morphology of gastric parietal and chief cells in an animal model of type 1 diabetes

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**BACKGROUND:** Diabetes mellitus (DM) is chronic disease affecting more than 124 million worldwide. Gastric pathology is a common complication of DM.

**AIM:** The aim of this study was to evaluate the morphological changes in the parietal and chief cells in the gastric glands of streptozotocin-induced diabetic rats.

**METHODS:** Diabetes mellitus was induced by a single intraperitoneal injection of streptozotocin (STZ, 60 mg/kg). A similar quantity of phosphate buffered solution was administered to control rats. Immunofluorescence, light and electron microscopy were used to determine the pattern of distribution and structure of parietal and pepsinogen-containing chief cells, respectively.

**RESULTS:** Electron micrographs of the parietal cells of the glandular stomach of rats showed that parietal cells were scattered haphazardly in diabetic compared to control rats and the parietal cells appear intact in normal and ill-defined in diabetic rats. Pepsin-immunoreactive cells were seen in the basal region of the glands of the corpus of the stomach of both normal and diabetic rats. However, the number of pepsin-immunopositive cells was significantly higher in the stomach of normal rats compared with that of diabetic rat. The rough endoplasmic reticuli (RER) of the chief cells of gastric glands was disrupted and fewer in diabetic rats compared to control.

**CONCLUSION:** Long-term DM induces morphological changes in the gastric parietal and chief cells. DM causes a reduction in the number of pepsin-containing chief cells in gastric glands. The abnormal distribution of RER in the chief, and parietal cells of the gastric glands of diabetic rats may contribute to reduced pepsin and acid production, respectively. All of these observations may contribute to the development of dyspepsia and hypoacidity observed in patients with diabetes mellitus.

P15

**Withania coagulans Fruit Extract protects Diabetic Nephropathy through Inhibition of Inflammatory cytokines and Oxidative Stress in Streptozotocin-Induced Diabetic Rats.**

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Diabetes nephropathy (DN) is the major determinant of morbidity and mortality in patients with diabetes. The development of DN is associated with increase in levels of inflammatory cytokines and localized tissue oxidative. Hyperglycemic control in diabetes is key to prevent the development and progression of DN. Therefore, the present study was carried out to investigate the changes in oxidative and inflammatory status in streptozotocin-induced diabetic rat's kidneys and serum following treatment with *Withania coagulans*, a popular herb of ethnomedicinal significance. The key markers of oxidative stress and inflammation such as inflammatory cytokines (IL-1 $\beta$ , IL-6, and TNF- $\alpha$ ) and immunoregulatory cytokines (IL-4 and IFN- $\gamma$ ) were increased in kidneys along with significant hyperglycemia. However, treatment of four-month diabetic rats with *Withania coagulans* (10mg/kg) for 3 weeks significantly attenuated hyperglycemia and reduced the levels of proinflammatory cytokines in kidneys. In addition, *Withania coagulans* treatment restored the glutathione levels and inhibited lipid peroxidation along with marked reduction in kidney hypertrophy. This study demonstrates that *Withania coagulans* improved hyperglycemia and maintained antioxidant status and reduced the proinflammatory markers in kidneys, which may subsequently reduce the development and progression of renal injury in diabetes. The results of the present study are encouraging for its potential use to delay the onset and progression of diabetic renal complications. However, the translation of therapeutic efficacy in humans requires further studies.

P16

### **Increased pro-inflammatory cytokines, glial activation and oxidative stress in the hippocampus after short-term bilateral adrenalectomy**

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Bilateral adrenalectomy (ADX) has been shown to damage the hippocampal neurons. However, the effects of short-term ADX is not studied. Therefore, we aimed to investigate the effects of short-term ADX on the levels of pro-inflammatory cytokines, response of microglia, astrocytes, neuronal cell death and oxidative stress markers over the course of time (4 h, 24 h, 3 days, 1 week and 2 weeks) in the hippocampus.

Our results showed a transient significant elevation of pro-inflammatory cytokines IL-1 $\beta$  and IL-6 from 4 h to 3 days in the ADX compared to sham. TNF- $\alpha$  levels were significantly elevated at 4 h only in ADX compared to sham. Time dependent increase in degenerated neurons in the dorsal blade of the dentate gyrus from 3 days to 2 weeks after ADX. Quantitative analysis showed significant increase in the number of microglia (3, 7 and 14 days) and astrocytes (7 and 14 days) of ADX compared to sham. A progression of microglia and astroglia activation all over the dentate gyrus and their appearance for the first time in CA3 of adrenalectomized rats hippocampi compared to sham was seen after 2 weeks. A significant decrease of GSH levels and SOD activity and increase in MDA levels were found after 2 weeks of ADX compared to sham.

Our study showed an early increase in the pro-inflammatory cytokines followed by neurodegeneration and activation of glial cells as well as oxidative stress. Hence, early inflammatory components might contribute to the initiation of the biological cascade responsible for subsequent neuronal death. These findings suggest that inflammatory mechanisms precede neurodegeneration and glial activation.

**KEYWORDS:** Adrenalectomy; Hippocampus; Neurodegeneration; Neuroinflammation; Oxidative stress.

P17

**Semantic word category deficits in Semantic Dementia and Posterior Cortical Atrophy****Zubaida Shebani***Department of Linguistics, College of Humanities and Social Sciences*

Imaging studies have found that brain regions outside the classical language areas of the brain (Broca and Wernicke's areas) become active during lexical and semantic processing. However, whether these brain regions play a functional role in the semantic processing of different word categories remains a matter of debate. The present study investigates word processing in two groups of patients whose degenerative brain diseases preferentially affect specific parts of the brain to determine whether their performance would vary as a function of semantic categories proposed to recruit those brain regions. Patients from two clinical groups participated in the study, those with Semantic Dementia (SD), who have anterior temporal-lobe atrophy, and those with Posterior Cortical Atrophy (PCA), who have predominantly occipito-parietal atrophy. They performed a lexical decision task on words from five different lexico-semantic categories: colour (e.g., *crimson*), form (*rectangle*), number (*thirteen*), spatial prepositions (*between*) and function words (*moreover*). Although broad word processing deficits were apparent in both patient groups, the deficit was strongest for colour words in SD and for spatial prepositions in PCA. These category-specific semantic deficits show that specific extra-sylvian regions of the brain are pertinent for the processing of different semantic categories of words.

P18

### **Role of Parathyroid Hormone Like Hormone (PTHLLH) in Gastric Epithelial Homeostasis, using Parietal Cell Specific Knockout Mouse Model**

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Gene expression study on mouse stomach has revealed parathyroid hormone like hormone (pthlh) as a novel gastric growth factor. pthlh has been found to be widely expressed in variety of tissues during the developmental stages as well as adulthood. It has been identified that pthlh has effect on proliferation and differentiation, and also it is highly expressed in gastric cancer, yet the function is unknown. Previous work using reporter mouse, identified the acid-secreting parietal cells as the source of pthlh. Apart from acid secretion and activation of gastric enzymes, it is thought that parietal cells are responsible for cellular proliferation and differentiation in gastric glands. Parietal cell loss is also found to be associated with gastric cancer, but the mechanism is yet unclear. Therefore, it is of utmost importance to identify the gastric function of pthlh. The pthlh knockout are lethal and hence, the novel idea of this project is to identify the specific function of pthlh by taking advantage of the tissue specific pthlh knock out. We have successfully established a generation of genetically engineered mouse model with specific deletion of pthlh in parietal cells. Immuno-histochemical analysis of parietal cell using HK-ATPase  $\beta$  has revealed smaller and reduced number of parietal cells in the stomach. Further, it was also observed from the differential staining that the surface mucus cells have invaded deep inside the glands compared to the control mice, possibly as a protective mechanism to compensate the lesser number of parietal cells. Further analysis using quantitative Real Time- Polymerase Chain Reaction (qRT-PCR) and Immuno-histochemical analysis with markers specific for proliferation and differentiation will be vital to identify the role of pthlh in gastric cellular homeostasis. Successful completion of this project will enable us not only to identify the specific function of pthlh in stomach but it will also lead us to better understanding of the unknown role of pthlh in gastric cancer.

**P19**

**Inhibiting non-receptor tyrosine kinases associated with prostate cancer using polypharmacological natural compounds**

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Prostate cancer is one of the most frequently diagnosed forms of cancer with high global incidence and mortality rate. Protein kinases are attractive therapeutic targets against prostate cancer due to their vital role in regulating various cellular processes. Over expression of several non-receptor tyrosine kinases (NRTKs) have been widely observed in prostate cancer. In this study, a large collection of natural compounds from the InterBioScreen library was virtually screened against three major kinases - Bruton's tyrosine kinase (BTK), focal adhesion kinase (FAK) and Src kinase to identify novel polypharmacological molecules that could inhibit the activity of these proteins. Molecular docking analysis revealed that four natural compounds that are structurally similar, possessed polypharmacological properties by interacting with these three NRTKs in a similar manner by orienting one end towards the hinge region and the other towards the activation loop. Binding score and interactions of these natural compounds were better than currently available kinase inhibitors. Thus, these natural molecules could be a framework for developing novel kinase inhibitors for the treatment of prostate cancer.



P20

### **Structural insights into the polypharmacological activity of dietary flavonols on serine/threonine kinases**

**Bincy Baby, Priya Antony, Walaa Al Halabi, Zahrah Al Homedi, Ranjit Vijayan**

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Discovering or designing drug molecules that can simultaneously interact with multiple targets is gaining interest in contemporary drug discovery. Serine/threonine kinases are attractive targets among protein kinases for therapeutic intervention in oncology due to the altered expression in cellular phosphorylation. Quercetin, a naturally occurring flavonol, has attracted attention for its ability to inhibit various cancer cell lines. The biological activity of quercetin glycosides has also received some attention due to their high bioavailability and activity against various diseases including cancer but has been studied to a lesser extent. This study explored the structural insights of the multitarget inhibitory activity of quercetin and its glycoside derivative, isoquercitrin on serine/threonine kinases using molecular modeling. Structural analysis showed that both quercetin and isoquercitrin exhibited good binding energies and interacted with the key aspartate residue in the highly conserved Asp-Phe-Gly motif. The results indicate that isoquercitrin could be a more potent inhibitor of several members of the serine/threonine kinase family. Thus, this study provides a structural picture of the multitarget inhibitory property of quercetin and its potential to be a chemical platform for oncological polypharmacology.

## P21

**Diesel exhaust particles in lung aggravate renal inflammation, oxidative stress and DNA damage in adenine-induced chronic kidney disease in mice**Nemmar A.<sup>a</sup>, Karaca T.<sup>b</sup>, Beegam S.<sup>a</sup>, Yuvaraju P.<sup>a</sup>, Yasin J.<sup>c</sup>, Hamadi N.K.<sup>d</sup>, Ali B.H.<sup>e</sup><sup>a</sup>*Department of Physiology, College of Medicine and Health Sciences, UAEU, Al Ain, UAE;*<sup>b</sup>*Department of Histology and Embryology, Faculty of Medicine, Trakya University, Edirne, Turkey;*<sup>c</sup>*Department of Internal Medicine, College of Medicine and Health Sciences, UAEU, Al Ain, UAE;*<sup>d</sup>*Department of Pharmacology, College of Medicine and Health Sciences, UAEU, Al Ain, UAE;*<sup>e</sup>*Department of Pharmacology and Clinical Pharmacy, College of Medicine & Health Sciences, Sultan Qaboos University, Al-Khod, Sultanate of Oman*

Epidemiological evidence indicates that patients with chronic kidney diseases have increased susceptibility to adverse outcomes related to long-term exposure to particulate air pollution. However, mechanisms underlying these effects are not fully understood. Presently, we assessed the effect of prolonged exposure to diesel exhaust particles (DEP) on chronic renal failure induced by adenine (0.25% w/w in feed for 4 weeks), which is known to involve inflammation and oxidative stress. DEP (0.5m/kg) was intratracheally (i.t.) instilled every 4th day for 4 weeks (7 i.t. instillation). Four days following the last exposure to either DEP or saline (control), various renal endpoints were measured. While body weight was decreased, kidney weight increased in DEP+adenine versus saline+adenine or DEP. Water intake, urine volume, relative kidney weight were significantly increased in adenine+DEP versus DEP and adenine+saline versus saline. Plasma creatinine and urea increased and creatinine clearance decreased in adenine+DEP versus DEP and adenine+saline versus saline. Tumor necrosis factor  $\alpha$ , lipid peroxidation and reactive oxygen species were significantly increased in adenine+DEP compared with either DEP or adenine+saline. The antioxidant catalase was significantly decreased in adenine+DEP compared with either adenine+saline or DEP. Notably, renal DNA damage was significantly potentiated in adenine+DEP compared with either adenine+saline or DEP. Similarly, systolic blood pressure was increased in adenine+DEP versus adenine+saline or DEP, and in DEP versus saline. Histological evaluation revealed more collagen deposition, higher number of necrotic cell counts and dilated tubules, cast formation and collapsing glomeruli in adenine+DEP versus adenine+saline or DEP. We conclude that prolonged pulmonary exposure to diesel exhaust particles worsen renal oxidative stress, inflammation and DNA damage in mice with adenine-induced chronic renal failure. Our data provide biological plausibility that air pollution aggravates chronic renal failure.

P22

**SMARCAD1 knockdown uncovers its role in breast cancer cell migration, invasion and metastasis**

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Breast cancer is the most common cancer seen in women worldwide and breast cancer patients are at high risk of recurrence in the form of metastatic disease. Identification of genes associated with invasion and metastasis is crucial in order to develop novel anti-metastasis targeted therapy. It has been demonstrated that the DEAD-BOX helicase DP103 was implicated in breast cancer invasion and metastasis. SMARCAD1 is also a DEAD/H box-containing helicase, suggested to play a role in genetic instability. However, its involvement in cancer migration, invasion, and metastasis has never been explored.

Using two different designs of shRNA targeting SMARCAD1, we investigated the impact of SMARCAD1 knockdown on the migration, invasion, and metastasis potential of the breast cancer cells MDA-MB-231 and T47D.

We observed that SMARCAD1 knockdown in the invasive breast cancer cells MDA-MB-231 unlike in the non-invasive breast cancer cells T47D was associated with an increased cell-cell adhesion and a significant decrease in cell migration, invasion, and metastasis due at least in part to a strong inhibition of STAT3 phosphorylation.

These results indicate that SMARCAD1 is involved in breast cancer metastasis and can be a promising target for metastatic breast cancer therapy.

P23

**Difference in shortening and calcium signaling in ventricular myocytes across the walls of the diabetic heart**

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The left side of the heart pumps blood at higher pressure than the right side. Within the ventricles, the electromechanical properties of cardiac myocytes vary transmurally and this may be related to the gradients of stress and strain experienced *in vivo* across the ventricular walls. Electromechanical function in the diabetic heart is frequently compromised. Contraction and Ca<sup>2+</sup> transport have been investigated in epicardial (EPI) and endocardial (ENDO) left ventricular myocytes in the streptozotocin (STZ)-induced diabetic rat. Diabetes was induced in male rats with STZ (60 mg/kg bodyweight, i.p.) and experiments were performed from 12 weeks after treatment. Diabetes was characterized by 5-fold increase in blood glucose. Shortening and intracellular Ca<sup>2+</sup> were measured by video edge detection and Fura-2 microfluorimetry, respectively. Whole-cell patch clamp techniques were used to record L-type Ca<sup>2+</sup> current. The time course of shortening was variously altered in myocytes from STZ compared to control heart. Time to peak (TPK) shortening was prolonged to similar extents in ENDO (110±2ms) and EPI (107±2ms) myocytes from STZ-treated rats compared to ENDO (90±2 ms) and EPI (83±2 ms) myocytes from controls. Time to half (THALF) relaxation of shortening was prolonged in ENDO myocytes from STZ-treated rats (59±2 ms) compared to ENDO controls (51±1ms). The time course of the Ca<sup>2+</sup> transient was variously altered in myocytes from STZ compared to control heart. TPK Ca<sup>2+</sup> transient was prolonged in ENDO myocytes from STZ-treated rats (71±2 ms) compared to ENDO controls (61±1 ms). THALF decay of the Ca<sup>2+</sup> transient was prolonged in ENDO myocytes from STZ-treated rats (180±5 ms) compared to ENDO controls (150±3 ms). Sarcoplasmic reticulum fractional release of Ca<sup>2+</sup> was reduced in EPI myocytes from STZ-treated rats compared to EPI controls. L-type Ca<sup>2+</sup> current amplitude, inactivation and recovery from inactivation were not significantly altered in EPI and ENDO myocytes from STZ-treated rats or controls. Regional differences in mechanical function and Ca<sup>2+</sup> transport across the wall of the healthy heart and the STZ-treated rat heart may underlie some of the hemodynamic properties in normal heart and disturbances in hemodynamic properties in diabetic heart.

Research project supported by grants from CMHS, UAEU and Zayed University.

P24

## Effects of *In Vivo* Sirolimus Treatment on Murine Thymus Tissue

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Sirolimus(also known as rapamycin)is a natural product of *Streptomyceshygroscopicus*. This immunosuppressive drug is commonly used to prevent organ transplantation rejection. Its mode-of-action is inhibition of mTOR (mechanistic target of rapamycin). This molecular pathway is involved in regulating cell metabolism, growth, proliferation, and signaling.This study investigated the impact of sirolimus on the thymus of BALB/C mice. The designed experiments involved three different doses of sirolimus. The following parameterswere measuredin the treated and untreated (control) mice: body weight, thymus size, cellular bioenergetics, histology, and immunohistochemistry (expression of active caspase 3 and release of cytochrome c from mitochondria).Mice received intraperitoneal injections of sirolimus (drug treated mice) or DMSO (control mice) for five uninterrupted days every week for 4 weeks. The thymus and control organs were obtained at the end of treatment and processed for the studies. Mice treated with sirolimus exhibited less weight gain, regression in thymus size, and alteration of cellular metabolism.

P25

**Comparison Between Advanced Corneal Surface Ablation and Femtosecond Thin Flap LASIK: Clinical Outcome and Changes in Higher Order Aberrations for Myopia**

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**PURPOSE:** To compare the change of the ocular and corneal high order aberrations after wavefront-guided advanced surface ablation (WF-ASA) techniques (AA-PRK, LASEK, Epi-PRK, and Epi-LASIK) and IntraLase LASIK (IntraLase™ FS Laser) using STAR S4 IRTM for myopia.

**METHODS:** Ocular wavefront aberration and corneal topography of 240 eyes in the WF-ASA techniques, and 140 eyes in the thin flap LASIK group with range of spherical correction of 0.00 to -8.00D, were obtained before and 3 months following treatment. Wavefront (ocular) aberrations were measured using the WaveScan, wavefront™ system aberrometer. Corneal aberrations were obtained from elevation maps (Pentacam, Oculus) and calculated by ray-tracing using custom software. Corneal and ocular aberrations were described as Zernike polynomials and analysis focused on total high order aberrations (HOAs), spherical aberration (SA) and coma.

**RESULTS:** There was statistically significant ( $P < 0.001$ ) surgically induced increase in SA in each of the techniques at 3 months for both ocular and corneal analysis. Total HOAs also increased significantly ( $P < 0.001$ ) in all groups following surgery both for ocular and corneal analysis. There was increase of mean coma by 3 months postoperatively for ocular as well as corneal values. In WF-ASA techniques, the flap-off versus flap-on procedures revealed no significant difference in the induced ocular or corneal aberrations except for corneal coma, where the flap-off group was 0.05 (0.03, 0.10) compared to flap-on group 0.02  $\mu\text{m}$  (.04, 0.10) ( $P < 0.05$ ). Detailed results of comparison between the WF-ASA techniques and IntraLase thin flap LASIK will be discussed at the meeting.

**CONCLUSION:** At 3 months all procedures resulted in a significant increase in HOAs and SA

P26

**Protein complex detection by integrating pseudo amino acid composition features and IBK classifier**

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In recent years, researchers have started to pay more attention to mining and analyzing biological networks. For instance, predicting protein complexes from protein-protein interaction data is becoming a fundamental problem in computational biology. Protein complexes are groups of associated polypeptide chains whose malfunctions play a vital role in disease development. Complexes can perform various cell functionality, such as dynamic signaling, serve as cellular machines, rigid structures, and post-translational modification systems. Many disorders are consequences of changes in a single protein, and thus, in its set of associated partners and functionality. In this project, we developed a machine learning based method to identify protein complexes. Pseudo amino acid composition (PseAA) is used as a way of representing protein sequences. The extracted features are then used in conjunction with several machine learning classifiers such as SVM, Naïve Bayes, Random Forest and IBK to distinguish between proteins in 78 reference different complexes. The proposed method was able to detect 69 complexes out of the reference complexes with high precision. In comparison with state- of-the-art methods such as ClusterONE, CMC, MCode, PEWCC, ProRank, the evaluation results indicate that the proposed method has great potential in detecting protein complexes.

**P27**

**Cloning of *Homo sapiens* PDX1 antisense RNA 1 (PDX1-AS1), a long non-coding RNA**

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The metabolic syndrome, which includes type 2 diabetes, obesity, hyperlipidaemia and cardiovascular diseases, is the new epidemic affecting the world today. According to the World Health Organization more than 60% of deaths globally are because of metabolic diseases. UAE with its socio-economic transitions is heavily affected by metabolic diseases. Pancreatic and duodenal homeobox 1(PDX1) is a transcription factor necessary for pancreatic development, including  $\beta$ -cell maturation, and duodenal differentiation and plays an important role in the pathophysiology of metabolic diseases. We have identified a long non-coding RNA (lncRNA) termed PDX1 antisense RNA 1 (PDX1-AS1) which is transcribed at the opposite direction to Pdx1. LncRNAs are a class of transcribed RNA molecules with a length of more than 200 nucleotides. LncRNAs can be transcribed as whole or partial natural antisense transcripts (NAT) to coding genes and may act as either gene inhibitors or activators through a range of diverse mechanisms. The functional significance of this long coding RNA, PDX1-AS1 is not known. So we have cloned PDX1-AS1 long non coding RNA in order to understand the functional significance in metabolism and its contribution if any to metabolic diseases.



## Colon inflammation suppresses spontaneous electrical activity: High resolution mapping study using an experimental colitis model

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**BACKGROUND:** Inflammatory bowel disease (IBD) such as ulcerative colitis (UC) play an important role in colonic motility disorders. The genesis of UC is multifactorial but it is well known that UC patients suffer from abnormal colonic motor function. This suggest that inflammation in the colon modulate neuromuscular circuitry to influence colonic motility. The gastrointestinal motor function is controlled by complex processes in the gut involving both neurogenic (via enteric nervous system) and myogenic (initiated by interstitial cells of Cajal) activity. Electrical activity is an integral part of gastrointestinal motility, characterized by bursts of action potentials (spikes) which precede motor function. To date, no studies have looked at the pattern of electrical activity that may be affected by inflammatory processes in the colon.

**METHODS:** Male Sprague Dawley rats (initial weight 205.42±17.76g, n=8) were selected and divided into a control and a test group. The control group received *ad libitum* food and water while the test group received 5% DSS in their drinking water during 7 days. Weight, stool consistency, and rectal bleeding were monitored daily to establish their disease activity index (=DAI). On day 7, the whole colon was removed after laparotomy (anesthesia: sodium pentobarbital 60mg/kg body wt) and its length measured. The proximal colon was then isolated, opened along the mesenteric border and placed in a 300 ml-organ bath superfused with 100ml/min Tyrode solution. Spike potentials were recorded from the serosal surface using an array of 11x11 Teflon-coated silver wires (1 mm inter-electrode distance) that was sequentially positioned in steps of 11 mm in the aboral direction. The electrical signals were recorded using customized software and analyzed for frequency and total area of spike propagation.

**RESULTS:** Rats treated with 5% DSS showed a significant increase in DAI compared to the controls on day 7(DSS 2.67±1.06, control 0.44±0.88, p<0.01). DSS group also showed a significant decrease in total colon length compared to controls (DSS 12.5±1.47 cm, control 16.0±1.08 cm, p<0.01). The colonic spontaneous spike potential frequency decreased significantly in the aboral part of the proximal colon in the DSS group compared to controls (DSS: 5.67±5.99, Control: 19.0±11.94 spikes/min p<0.001). Furthermore, the area activated by individual spikes decreased steadily in DDS compared to controls (Control: 76mm<sup>2</sup>, DSS:24mm<sup>2</sup>, p<0.001).

**CONCLUSION:** Inflammation of the colon markedly decreased frequency and large areas of spontaneous electrical activity in the proximal colon in DSS treated rats. This electrical inhibition may be one reason for the clinically observed abnormal colonic motor function seen in UC patients.

P29

**Molecular mechanisms underlying the effect of hyperglycemia on neurogenesis using human embryonic stem cells****Suraiya Ansari***Department of Biochemistry, College of Medicine and Health Sciences, UAEU*

The global prevalence of metabolic disorders such as diabetes and obesity has increased drastically during the past few decades. Pre-gestational and gestational diabetes has been associated with neurodevelopmental disorders in the offspring. However an understanding of the molecular mechanisms of this connection is not known yet, especially in human. In this study, we have employed well established protocols that mimic the cell proliferation and differentiation of human embryonic stem cells (hESCs) into neurons of human embryonic prefrontal region (PFC) of the cerebral cortex. PFC region of brain is known to be involved in cognition, language and memory and a defect in this region of brain is associated with various neurodevelopmental disorders including Autism Spectrum Disorders (ASD), Intellectual Disability (ID) and Attention Deficit Hyperactivity disorder (ADHD). One of the molecular mechanisms through which hyperglycemia exerts its effect on cellular metabolism is through O-GlcNac modification of proteins. Increased blood glucose levels cause increased levels of O-GlcNacylation inside the cells through hexosamine biosynthetic pathway (HBP). Increasing global levels of O-GlcNacylation by pharmacological intervention could be used as a tool to study the effect of protein O-GlcNacylation on embryonic neurogenesis. Therefore, in this study we used hESCs to differentiate into cortical neurons *in vitro* after increasing the levels of total O-GlcNac in ESCs. Our data illustrate that stage specific expression of pluripotency and neural differentiation markers and histones are affected adversely by increased O-GlcNac levels, thereby implying the ill-effects of maternal metabolic disorders on the developing embryo.

P30

**Understanding the effect/s of high levels of free fatty acids on human embryonic hepatogenesis: use of human embryonic stem cell (hESC) derived hepatocytes as model**

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The rates of obesity and metabolic syndrome are increasing rapidly in the Middle East, including the UAE. A high percentage of the obese population in the UAE is females, many of which are of childbearing age. Exposing the embryo to high levels of blood lipids, especially saturated fatty acids can activate signaling pathways which could impact the fate of stem cells and organ development, eventually affecting their response to postnatal development. Since the liver is the major metabolic organ, it is at an increased risk of being affected in the developing embryo of an obese mother. In order to understand the effects of high lipid exposure on the developing embryo, we treated human embryonic stem cells (hESCs) with high levels of a saturated fatty acid, palmitate, and employed their differentiation towards a hepatic fate. We then tried to identify expression of pluripotency markers as well as those of endodermal and hepatic fates by immunocytochemistry and quantitative PCR, comparing the expression in normal vs treated cells. The results we obtained showed that palmitate concentrations higher than 250 $\mu$ M were toxic to the undifferentiated hESCs and treating the hESCs with 250 $\mu$ M of palmitate showed no effect on the pluripotency marker OCT4.

P31

**Novel Quinazolines as antibacterial agents :A new hope**Shaikha S. Al-Neyadi<sup>1</sup>, Akela Ghazawi<sup>2</sup>, Tibor Pa<sup>1 2</sup>, and Ibrahim M. Abdou<sup>1\*</sup><sup>1</sup>Department of Chemistry, College of Science, UAE University Al-Ain, 15551 UAE<sup>2</sup>Department of Microbiology and Immunology, Faculty of Medicine and Health Sciences, UAEU

Quinazolines are highly bioactive heterocyclic compounds with wider range of antimicrobial activities. In the present work, quinazolines have been designed and synthesized using palladium catalyzed reactions. The position 2,4,3 and 6 of quinazoline ring have been selected for different substitution. The synthesized compounds were characterized using IR, NMR & elemental analysis and were screened for antibacterial activities against four pathogenic bacteria. A significant, high selectivity and sensitivity results were obtained. Compounds **18b** and **8** showed higher sensitivity toward *S. aureus* (Gram positive) with an MIC = < 0.25-0.5 µg/ml respectively. While, compounds **12a** and **12b** were found more effective and more sensitive in gram negative bacteria with an MIC < 0.25 µg/ml against *Escherichia coli* and high activities against *Pseudomonas aeruginosa* with an MIC value of 0.5 and 1.0 µg/ml respectively. The broadest antibacterial activities were observed with the quinazolines **29a-c** having a MIC value ranging between < 0.25-2 µg/ml. Study of structure-activity relationship showed that the most effective derivatives were those carrying pyrimidine moiety at position 6 of the quinazoline ring. While, Schiff bases linked to quinazoline moiety showed moderate to good activity. Also, this study showed that the switching the counter-ion used may influence the properties of the molecule and results in different biological activities and the encapsulation of the insoluble quinazolines with β-cyclodextrin increased its water solubility and bioavailability. The present study reveals that some quinazolines could be used as a template for the future development through modification or derivatization to design more potent therapeutic agents.

**KEYWORDS:** *Quinazoline, antibacterial, synthesis, β-cyclodextrin*

## **Type I Diabetes mellitus and Early Osteoporosis**

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Diabetes Mellitus adversely affects the skeleton and is associated with an increased risk of fragility fractures. The socioeconomic cost of osteoporosis and associated fractures is high and is expected to increase remarkably over the next decades due to increasing life expectancy. Type I diabetes is related to low bone mineral density (BMD) and such patients experience fragility fractures due to altered bone quality. Bone mineral density can be easily measured in diabetic patients with the help of dual-energy X-ray absorptiometry scan in clinical practice but bone quality is often overlooked and hence not much data is available on bone quality factors. The most important factor that affects bone quality is microstructure of bone.

In this ongoing study we are analyzing the microstructure of bone in a rat model of type I diabetes using various histological techniques.

We induced experimental diabetes mellitus in normal adult Wistar rats by injecting Streptozotocin 60mg/kg body weight intraperitoneally. Animals were injected with alizarin complexone 25mg/kg body weight S/C prior to inducing diabetes to label any pre-existing microdamage and microstructural features. After inducing diabetes we injected fluorochrome agents (calcein green 10 mg/kg body weight and xylenol orange 90mg/kg) at varying intervals. Bones were collected and prepared for histology to view bone microstructure. Decalcified and undecalcified bone specimens were cut using leica microtome 2265 and diamond saw respectively. The specimens were fixed, processed, sectioned and stained for microscopy using standard protocols (Mohsin et al., 2006). We analysed bone cells using various histological techniques such as 'TUNEL' to identify apoptotic osteocytes and 'Tartrate-Resistant Acid Phosphatase' (TRAP) to stain osteoclast number. We viewed them using bright light and fluorescence microscopy.

We were able to detect increase number of apoptotic osteocytes and osteoclasts and microcracks in diabetic bones as compared to control specimens.

This study once completed will give us better insight into pathogenesis of increased fracture risk which will help us in managing and preventing bone complications in diabetes.

Mohsin, S., O'Brien, F.J., Lee, T.C (2006). Osteons as barriers to crack growth in compact bone. *Journal of Anatomy*, 208:81-89.

P33

**Mitotic arrest and apoptosis in triple negative breast cancer cells induced by newly designed chromenes**

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Cancer is the second leading cause of death worldwide. Conventional therapies cause serious side effects and, at best, extend the patient's lifespan. Cancer control may therefore benefit from the potential that resides in alternative therapies. There is thus, an increasing demand to utilize alternative concepts or approaches to the prevention of cancer. The principal aim of this research is to screen and identify new synthetic compounds "chromenes", with high efficiency, for breast cancer therapy. In this study, we have synthesized newly designed chromenes and tested them for their potential anticancer activities against the triple negative breast cancer (TNBC) MDA-MB-231 cells. The compounds significantly inhibited, in time- and concentration-dependent manner, the viability of the the breast cancer cell lines and induced apoptotic cell death as well. Furthermore, cell cycle distribution analysis on chromenes-treated cells revealed that the cell underwent a mitotic arrest confirmed by an increased expression of the M phase specific marker, p(ser10) histone H3. Further investigations are underway to elucidate the molecular mechanism(s) through which chromenes exerts their anti-cancer effects. In conclusion, our current study provide preliminary evidences that chromenes could be a potential therapeutic compounds against the TNBC.

**KEYWORDS:** cancer, chromenes, anti-cancer agent, apoptosis, cell cycle.

**Bioactivity of arid region honey: An *in vitro* study**Serene Hilary<sup>1</sup>, Hosam Habib<sup>2</sup>, Usama Souka<sup>1</sup>, Wissam Ibrahim<sup>1</sup>, Carine Platat<sup>1</sup><sup>1</sup>*Nutrition and Health department, College of Food and Agriculture, UAEU, Al Ain, UAE*<sup>2</sup>*Alexandria University, 22 El-Guish Road, El-Shatby, Alexandria-21526, Egypt*

**BACKGROUND:** Antioxidant and anti-inflammatory property of honey have been largely recognized by various studies. Almost all of its potential benefits are associated with polyphenol content. Honey varieties from the arid region are reported to be rich in polyphenols, but data related to its bioactivity *in vitro* is greatly lacking. This study aimed at establishing the anti-oxidant and anti-inflammatory property of arid region honey. Four honey varieties from arid region (H1, H2, H3, and H4) and two popular non-arid region honey (H5 and H6) were tested *in vitro* in this study

**METHODS:** Erythrocyte membrane protection effect of honey varieties were measured by hemolysis assay after exposing erythrocytes to a peroxide generator. The subsequent lowering of MDA (malondialdehyde) content in erythrocytes was measured. Immunomodulatory effect of the honey varieties was tested in PC-3 cells and PBMC (peripheral blood mononuclear cells) by measuring the IL-6 (interleukin 6) and NO (nitric oxide) levels in culture. PC-3 cell viability was assessed after incubation with honey varieties for 24-hours.

**RESULTS:** Arid region honey exhibited superior erythrocyte membrane protection effect with H4 measuring at  $1.3 \pm 0.042 \text{mMTE/g}$  and H2 measuring  $1.122 \pm 0.018 \text{mMTE/g}$ . MDA levels were significantly reduced by honey samples, especially H4 ( $20.819 \pm 0.63 \text{nmol/mg protein}$ ). We observed a significant decrease in cell population in PC-3 after 24 hours in culture. A moderate increase in NO levels was observed in both cultures after 24 hours at the same time levels of IL-6 were remarkably reduced by honey varieties.

**CONCLUSION:** The result demonstrates the superior anti-oxidant effect of arid region honey due to its erythrocyte membrane protection effect and subsequent lowering of oxidative damage as evident from lower levels of lipid peroxidation product MDA. Arid region honey varieties were as good as non-arid region types are decreasing viability of PC-3 cells. The moderate increase in NO levels in both cultures were not significant enough to elicit pro-inflammatory response. However, IL-6 secretion was remarkably reduced by all honey varieties in a comparable level indicating the potential anti-inflammatory property of non-arid region honey.

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P35

**Saffron-based crocin prevents early lesion of liver cancer: In Vivo, in vitro and network analyses**

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Hepatocellular carcinoma (HCC) remains among the leading causes of cancer-related death worldwide. Natural compounds with robust antioxidative, hepatoprotective and anti-inflammatory properties are normally evaluated for their abilities to hinder tumors' growth. *Crocus sativus* is known for its medicinal benefits against a host of health disorders. One main biological component of saffron is crocin which was found to have antiproliferation and pro-apoptotic effects against different types of cancer. This study demonstrated the effects of crocin in chemically induced HCC animal model and promoted crocin as a potential anti-HCC drug. In this study, administration of crocin to DEN-induced HCC model caused a dramatic decrease in the number of GST-P positive foci that was consistent with a visible reduction in FAH formation that represents the initial morphological change in HCC development. Moreover, treatment with crocin decreased the activity of a key inflammatory regulatory mediator, NF- $\kappa$ B. Crocin exhibited anti proliferative and pro-apoptotic properties *in vitro*, where crocin caused G2 cell cycle arrest and thus blocked proliferation of HepG2 cells. The evident anticancer properties of the naturally occurring crocin make it not only a significant chemopreventive agent but a potent adjuvant therapy as well.



### Does aliskiren protect the kidney in ureteric obstruction?

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**PURPOSE:** Renin-angiotensin system blockade by angiotensin converting enzyme inhibitors or angiotensin receptor blockers has been shown to ameliorate the renal dysfunction following ureteric obstruction (UO), but the effect of blocking the first and rate-limiting step in this cascade by aliskiren, the first approved direct oral renin inhibitor, has not been investigated yet. Thus, the aim of this study was to investigate the effect of blocking renin-angiotensin system by direct renin inhibition using aliskiren on the renal dysfunction following reversible unilateral ureteral obstruction.

**METHODS:** Wistar rats underwent reversible left UO for 72 hours. Group-Alsk (n=12) received aliskiren (30 mg/kg/day) dissolved in water starting one day before creating ureteral obstruction and continued until the terminal experiment five days post reversal when renal functions were measured using clearance techniques. Group-Vx (n=12) underwent similar protocol but had water only. Gene expression analysis of some markers of kidney injury was measured using PCR technique.

**RESULTS:** In Group-Vx, renal blood flow (RBF) and glomerular filtration rate (GFR) in the left kidney were significantly lower than the right kidney ( $1.82 \pm 0.12$  vs.  $3.19 \pm 0.40$ ,  $P=0.001$  and  $0.81 \pm 0.08$  vs.  $1.44 \pm 0.09$ ,  $P=0.004$ , respectively). However, left fractional excretion of sodium ( $FE_{Na}$ ) was higher than the right  $FE_{Na}$  ( $0.80 \pm 0.15$  vs.  $0.55 \pm 0.04$ ,  $P=0.05$ ). Comparing the left obstructed kidney in Group-Alsk vs. Group-Vx, RBF and GFR were higher in Group-Alsk ( $2.44 \pm 0.30$  vs.  $1.82 \pm 0.12$ ,  $P=0.049$  and  $1.02 \pm 0.11$  vs.  $0.81 \pm 0.08$ ,  $P=0.07$ , respectively). The left renal  $FE_{Na}$  was lower in Group-Alsk but did not reach statistical significance ( $0.54 \pm 0.07$  vs.  $0.80 \pm 0.15$ ,  $P=0.07$ ). Aliskiren also decreased the gene expressions of neutrophil gelatinase-associated lipocalin (NGAL), kidney injury molecule-1 (KIM1) and the apoptotic protein p53.

**CONCLUSION:** Direct renin inhibition by aliskiren before, during and after release of unilateral ureteral obstruction appears to have a protective effect on the hemodynamic and tubular renal functional alterations as well as on the markers of renal injury. This indicates a potential benefit of this agent in the clinical set-up. Further, this data and the previous findings indicate that blocking renin-angiotensin system at any level has a protective effect in obstructive nephropathy.

P37

**The degree of bother and healthcare seeking behaviour in women with symptoms of genital organ prolapse from a developing Gulf country**

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**BACKGROUND:** Symptoms of genital organ prolapse (POP) can be distressing. Cultural factors lead to differences in healthcare-seeking behaviour among various nations. There is limited number of studies which addressed the healthcare-seeking behaviour in women with POP. The aim of this study was to determine the degree of bother, social impact and healthcare seeking behaviour of symptoms of POP in one of the Gulf countries and compare the results to published data from other areas.

**METHODS:** From January 2010- January 2011, data from all women attending the three family development centres in Al Ain (UAE) and reporting symptoms suggestive of POP were collected by well-trained interviewer-administered self-reported questionnaire.

**RESULTS:** Out of the 127 women who reported symptoms suggestive of POP (mean age: 38.2 years; range: 18-71), 111 (87.4%) had at least one activity (physical, social or prayers) or sexual relationship affected by the symptoms of POP. In 49 women (38%), the effect on at least one of these activities or relationships has been described as moderate and in 18 women (14%), the effect was severe.

69 women (54%) did not seek medical advice due to: embarrassment to see medical doctors (51%), the belief that POP is normal among women (51%), hope for spontaneous resolution (48%), embarrassment to see male doctors (33%) and unawareness of the existence of medical treatment (30%).

On univariate analysis, factors which significantly determined healthcare seeking behaviour were the need to insert the finger in the vagina to empty the bladder or bowel and the interference of symptoms with physical activities ( $P < 0.05$  for all). However, on multivariate analysis interference with physical activities was the only significant determinant ( $P = 0.04$ ).

**CONCLUSIONS:** Similar to other societies, symptoms of POP affect the quality of life in the majority of the affected women. Unlike some other societies, more than half did not seek medical advice mainly due to shyness and embarrassment and lack of proper knowledge about the condition. Interference of symptoms with physical activities was the main significant determinants of healthcare-seeking behaviour. Additional teaching campaigns designed according to cultural backgrounds in each society are required to address these sensitive issues.

P38

**Physiological performance, and the health impacts of rising temperatures in hot regions**

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Traditionally, much of the world's research into the impacts of climate change has focused on cooler non-tropical regions, and it is indeed in these higher northern latitudes that the largest temperature increases are being seen. Here, however, we explore the possibility that a small temperature increase in a region which is already too hot may actually have a more negative impact than a large temperature increase in a region which is still too cold. We start by constructing thermal performance curves for two tropical fish species; charting their breathing rates over a range of temperatures to identify the optimal temperature and to test whether they are already living above this optimum in their natural environments. Contrary to expectations, we found that performance continued to increase even in temperatures far above those to which they are accustomed. In both these species, it would appear that even in the Tropics they are still living far below their optimal temperatures, and any impact of rising temperatures on these physiological metrics of performance will actually be positive.

P39

### **Piezoelectric cardiac signal processing**

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Heart failure (HF) is becoming common due to the modern lifestyle and affects about 6 million Americans. HF patients need advanced disease management to improve the symptoms and to help the patients and family caregivers/nursing to transition from the hospital to home successfully. Telehealth care may help the patients and families to monitor and focus on changes in any symptoms. This might further reduce the patient's chances to visit of hospital visits by understanding the symptoms and promoting early detection of signs and symptoms of cardiac deterioration. Cardiac implantable electronic devices (CIEDs) can be used as one of the component of tele monitoring system. (CIEDs) include artificial pacemakers, cardiac resynchronization therapy (CRT) devices, and rhythm monitors. The CIED's are usually based on the piezo technology. Piezo technology is used widely within the domain of technology markets; such as the medical technologies, mechanical industry, and in the semiconductor technology industry. Because of piezoelectric material's high life time and reliability, it is suitable for biomedical project. In this research a piezoelectric based tele monitor is used to capture the signal from heart. The piezoelectric sensor is placed directly on the chest to obtain the most important parameters of the cardiac cycle. The signal processing, in the form of programming using MATLAB software, is conducted on the primary signal output of the sensor, parameters of the heart such as the heartbeat and blood pressure can be obtained.

The goal of this paper is to find an algorithm to process ECG signal, acquired from piezo electric device, using Matlab software. The QRS complex is the most important waveform within the electrocardiogram. The aim of our research is to import signals from the monitoring system to Smart Phone via wireless network for signal processing and to use in telehealth care. The portability and ease of use of this device is very much appreciable and will create great impact in the medical field. The signal processing unit with the device is an added advantage. Furthermore, we describe the basic methods for ECG signal processing.

P40

## **Prediction of Obesity and Abnormal Eating Behavior due to Body Image Perception in the United Arab Emirates**

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Our study focuses on the prediction of obesity and abnormal eating behavior due to body image perception in the United Arab Emirates (UAE). We investigate the relationship between body image dissatisfaction and risk factors for obesity via a mathematical modeling. We divide the whole population in the UAE into several subpopulation classes such as normal, overweight, overweight with body dissatisfaction, and obese classes according to a weight classification called body mass index (BMI), and abnormal eating behavior classes. We describe the transitions among the population classes via differential equations. Then, we predict the future prevalence of obesity of the UAE female national population through computer simulations of our model with UAE demographic data.

Also, for the current trend of body image perception in the UAE, we are recruiting UAE national females with age less than 45 years. Participants complete a socio data sheet, driving for thinness and use of social media tests, body shape questionnaire and Figure rate scale (FRS). From this, we expect an association between media messages, as well as peers and family pressures towards thinness and body image dissatisfaction, which may lead to abnormal eating behavior.

**P41**

**Physiology, performance, and the effects of rising tropical temperatures**

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To date, the great majority of studies into the effects of climatic warming have been done in cooler regions, and it is indeed in these higher northern latitudes that the largest temperature increases are being seen. Here, however, we examine the idea that smaller temperature changes in regions where it is already too hot might in fact have more negative effects than larger temperature changes in regions where it is still too cold. We begin by building thermal performance curves, identifying the optimal temperature by examining physiological performance over a range of temperatures and comparing these optimal temperatures with the temperatures commonly encountered in native tropical environments. Surprisingly, our results demonstrated that physiological performance could continue increasing even when temperatures were raised appreciably beyond those typically experienced. These particular findings suggest that tropical temperatures may in some cases still be well below the temperatures which are optimal, and the effects of further climatic warming on the physiological metrics studied here may in fact be positive.

### **Investigations on the seasonal and inter-annual variations of the atmospheric aerosol optical depth in the united arab emirates using modis satellite data**

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Air pollution has a significant impact on human health. Aerosols or particulate matter (PM) with aerodynamic diameter less than  $2.5 \mu\text{m}$  (PM<sub>2.5</sub>) is especially of major concern to human health because they can be inhaled easily into the lungs and cause serious respiratory health problems. It has been observed in the UAE that short-term exposures to common air contaminants such as fine particulate matter are linked with increased hospital admissions due to cardio-respiratory conditions, increased emergency room visits and work/school absenteeism, increased respiratory symptoms and decreased lung function. Long-term exposure is associated with increased deaths due to cardio-respiratory conditions, permanently damaged lung function, increased number of people with lung cancer, and increased premature births and low birth weight. The formation of such pollutants depends upon the sources of their precursors (natural or anthropogenic). The challenges of meeting air quality standards are impacted by identifying these sources and further the trans-borders transport of the pollutants.

Air quality monitoring has been always achieved with networks of ground monitoring stations and the use of models that evaluate emissions and predict changes in air quality. However, these ground monitors often miss pollution that is not within the sampling area of the measurement and are unable of capturing pollution for a large area. Satellite remote sensing is a viable method for monitoring air pollution over a large spatial extent on continuous basis. Advancement in satellite remote-sensing techniques has opened new corridors for the monitoring and mapping of air pollution over large regions. Currently, there are several satellites in orbit that have instruments suited for air quality measurements.

This research project uses the Moderate Resolution Imaging Spectroradiometer (MODIS) atmospheric aerosol optical depth (AOD) product, as an indicator of air pollution, for investigating its seasonal and inter-annual variability over the United Arab Emirates (UAE). The research helps to highlight the formation of air pollutants (particulate matter) natural or anthropogenic in the UAE, their seasonal and inter-annual variability and spatial distribution. In this regard, the AOD images over the UAE were analysed from 2006-2015 along with corresponding meteorological observations of air temperature, wind speed, air pressure for the same period. The preliminary findings indicate significant rise of AOD during the summer period due to increased wind speed and high temperatures. The spatial distribution of AOD over the UAE shows that AOD is not particularly higher in desert areas as previously thought, but along coastal regions due to increased humidity and water vapour content during the summer months. Furthermore, AOD in the UAE is primarily influenced by climatic conditions than industrial anthropogenic effects particularly from the hydrocarbon industries.

P43

### Survival Rates from In-Hospital Cardiac Arrest

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**BACKGROUND:** Cardiopulmonary resuscitation (CPR) has been used widely in hospital settings since its introduction over five decades ago. The epidemiology of in-hospital cardiac arrest (IHCA), the emergency response systems, survival rates, predictors and variables associated with survival after IHCA vary significantly among health care facilities worldwide. **Objectives:** To assess the survival rates from IHCA in a large governmental hospital in the emirate of Abu Dhabi, United Arab Emirates.

**DATA SOURCES:** The hospital Database of Life Support Training Center was searched to identify all inpatients that developed Cardiac Arrest (CA) and underwent Cardiopulmonary resuscitation (CPR) between 01 January, 2013 and 31 December, 2015. **Study method:** Retrospective study design to review IHCA- CPR attempts.

**MAIN OUTCOME MEASURES:** Survival rates after initial resuscitation, called return of spontaneous circulation (ROSC), and survival at discharge from hospital.

**INCLUSION CRITERIA:** All inpatients that developed CA and underwent in-hospital CPR between the specified dates.

**RESULTS:** Rates of survival following IHCA over a three year period varied from one year to another at this governmental hospital as well as the total admissions (22,800 in 2013, 19,599 in 2014 and 16,201 patients in 2015). At this hospital out of 685 patients included from all ages, there were 454 (66.3%) male patients and 231 (33.7%) female patients, and mean average of age was  $57.3 \pm 23.3$  years, and highest total number of CA events occurred in the ICU (316; 46.1%) and ER (217; 31.7%) units. Asystole as an initial rhythm was the leading rhythm in CA with a total of 445 (69.8%) events out of 685 CA events. The survival rates to ROSC were 38.3% and 7.7% of the patients survived to discharge.

**CONCLUSION:** Previous research has shown variability in inter- and intra-country survival to ROSC and discharge; however, this study represents the first data available for the United Arab Emirates. Epidemiological factors, preexisting cardiac disease or non-cardiac diseases prior to CA, initial rhythm in CA (shockable vs non-shockable), witnessed vs non-witnessed may be important predictors of survival rates to ROSC and discharge; however, further research is required in the UAE to validate the predictors.

**KEY WORDS:** Cardiac Arrest, Cardiopulmonary Resuscitation, In-Hospital Cardiac Arrest, Survival Rates.



## Electrical based Latest Trends for the Detection and Identification of Biotech Materials

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The recent advances in the field of biomedical and health informatics are emerging with a great pace where information and communication technologies intersect with health, healthcare, life sciences and biomedicine. The aim of this paper is to provide review for the electrical detection and identification of viruses, cells, DNA and exosomes which are the emerging concern in the world, as every day scientists and doctors discovering new diseases and modifications inside living organisms.

DNA, which carries the traits of living creatures, is requisite to the maintenance of homeostasis of life. A wide range of biological process need the comprehension of the electronic properties of DNA, for instance, restoring of impaired bonds in cells, identification of genetic alterations, as well as protein-DNA interactions.

Viruses are diminutive organisms that may cause mild to severe illnesses in humans, animals and plants. This may include common flu or cold to fatal diseases. The virus particle attacks the cell and take over its machinery to carry out their own life processes of multiplication and growth. An infected cell will produce viral particles instead of its usual products.

Electrical detection of biological cells can be dense, quick, and label-free. Till date, most electrical detection techniques, whether based on integrated microfluidic channel or local cell culture, involve huge quantities of cells. Although, many biomedical applications, such as drug resistance testing and pathogen detection, require single-cell sensing to assess the intrinsic cell response without interference from the encompassing solution. This is vital for experimental modeling of cell-level electrical results.

In this review study we generalize the description of the latest trends in the field of biomedical is presented which mainly focuses on researches carried out within three to four years span along with decade old studies keeping in mind. Focusing on worlds alarming biomedical events we tried to cover highlighted and alarming concern topics in this review paper.

P45

**New trends in vitamin D analysis**

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**BACKGROUND:** Vitamin D plays an important role in human health and disease as it has been related to many conditions like rickets, obesity, osteoporosis, type 2 diabetes and many more. Sunlight is the main source for vitamin D synthesis in our bodies, fish oil and some mushrooms are also rich sources of vitamin D. The main metabolites of vitamin D are 25OHD<sub>3</sub> and 25OHD<sub>2</sub> having a half-life of few weeks in human blood. Usually, these metabolites are measured for vitamin D determination in humans. The optimum levels of vitamin D in healthy people is (50-70 ng/ml). The aim of this review is to discuss the analysis of 25OHD measurement and to discuss the strengths and limitations of various techniques.

**METHODS:** Many methods of analysis have been tested for measuring vitamin D metabolites in human plasmas or serums. Immunoassay (IA), High Performance Liquid Chromatography (HPLC) and Liquid chromatography tandem mass spectrometry (LC-MS/MS) are the most widely used techniques to measure vitamin D.

**RESULTS AND DISCUSSION:** Immunoassay cannot distinguish between 25OHD<sub>3</sub> and 25OHD<sub>2</sub> forms of vitamin D and their epimers and it measures the total 25OHD only. On the other hand, HPLC is less sensitive technique to measure the downstream metabolites of vitamin D, epimers and isobars. LC-MS/MS can sensitively detect all the metabolites of vitamin D along with its epimers and isobars.

**CONCLUSION:** In summary, LC-MS/MS technique is the most robust and sensitive technique which can be used for accurate determination of all vitamin D metabolites. LC-MS/MS method cannot only separate the co-eluting epimers and isobars but it can also avoid other instrumental interferences. Our recently developed vitamin D test can measure up-to 10 different forms of vitamin D in humans using LC-MS/MS.

P46

**Medical Residency Research Perceptions: A Cross-Sectional Study Within Abu Dhabi Health Services Company (SEHA) Residency Centers in United Arab Emirates (UAE)**

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**INTRODUCTION:** Most Abu Dhabi Emirates residency programs had the Accreditation Council for Graduate Medical Education–International ACGME-I, as part of resident’s competency and scholarly activities. Current residency programs face difficulties in merging research training due to lack of time and relevant research resource. This study aimed to identify the principle requirements of medical residency to establish a well-structured resident research program in UAE.

**METHODS:** A cross-sectional survey data collected from questionnaire dealt with four domains; perceptions, needs, research environment, and training. Validity of the questionnaire (Kaiser Meyer Olkin score of 0.78, significant at  $p < 0.001$ ) and reliability was 0.8.

**RESULTS:** Medical residents surveyed ( $n=166$ , out of 181 total) yielded a response rate of 92%. High percentage of residents believed that research enabled: 1) better disease management (93.4%); 2) application in practice (92.8%); 3) career advancement (92.2%), 4) enhance professional status (89.2%), 5) team up other centers (89.2%), and 6) help board certification (75.3%)

**CONCLUSION:** Residents perceptions were positive towards research, included career advancement, better disease management and improvements in quality of postgraduate training programs. Training needs varied between didactic lectures to hands-on-training preferentially for study design and statistics (data not shown). It is anticipated that these findings will enable the transformation of residency program to more innovation-based practice and meet accreditation requirements for the ACGME-I and, resident opportunities elsewhere.

**P47**

**Impact of the Use of Social Media on Students Learning and Co-curricular Engagement: Evidence from UAE University**

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This study investigates the impact of the use of social media on the students' academic learning and co-curricular engagement. Two hundred three randomly chosen UAEU students, both male and female, responded to a well-designed questionnaire survey. The data has been analyzed using Minitab software, version 17. Both descriptive and inferential statistics have been used to analyze the data. No statistically significant relationship between the use of social media and students' learning has been found. The relationship between the use of social media and students' co-curricular engagement is also found to be insignificant.

## Internal Medicine Residency Rotation Heuristic Scheduling Solution

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**INTRODUCTION:** Internal Medicine residency scheduling of rotations is still mainly done manually by residency administrators. This is a tedious and time consuming task to balance and integrate residents' curriculum scheduling without violating residency scheduling rules. The curriculum scheduling guidelines apply to residents in one year combined with residents in all the years, which makes this process more complex. Most of the time and after days of tedious manual scheduling, the resulting schedule still contains several rule violations.

**METHODS:** An online automated heuristic scheduling system was developed for the Internal Medicine residency four-year program to schedule the rotations of residents. The list of residents and required rotations for each year as well as the scheduling rules were entered into a relational database (MS SQL Server). The website was developed using the ASP web programming language and is the interface to the system. User access control was given to each user based on what they are allowed to view or modify. The heuristic scheduling algorithm was developed using a rule violation score in which the algorithm seeks to minimize thus producing a violation free schedule.

**RESULTS:** The system was used for the past two years and shows that the solution space is fairly large and it's not difficult for the heuristic algorithm to find the solution within one hour of execution. Figure 1 shows the start of the process for year 1 residents in 2017/2018 with the list of residents, the list of rotations and the list rules. Figure 2 shows the result of random scheduling of year 1 residents showing several rule violations. Figure 3 shows a partial result for the heuristic algorithm reducing the rule violations from 18 to 15 in a few seconds. Figure 4 shows the reduced violation schedule from 18 to 3 violations in 14.4 minutes. Figure 5 shows the violation free year 1 schedule by residency administrator switching two sets of rotations by clicking (manually).

**CONCLUSION:** This automated heuristic scheduling solution solves the problem of scheduling rule violations and produces an Internal Medicine residency rotation schedule that conforms to the residency scheduling rules. Additional rescheduling of rotations by the residency administrator is also possible in the system and may be necessary in some cases where the automated heuristic scheduler fails to find a solution.

P49

**The use of ZigBee wireless transmission to send biomedical signals extracted using piezoelectric sensor**

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Cardiovascular diseases are the leading cause for death worldwide and UAE is not an exception. In fact, cardiovascular diseases account for 41% of all mortalities in UAE. Treatment for cardiovascular disease in UAE currently account for 36% of the total healthcare expenditure. The shift from traditional medical treatment to the prediction, prevention and/or early detection and warning from diseases have the potential to lower healthcare expense in general and cardiovascular disease treatment expenses in particular. This paper is showcasing the development of an innovative healthcare solution that will allow patient to be monitored remotely. The goal of this paper is to investigate the feasibility of using miniaturized and wearable piezoelectric sensor sheet to collect representative physiological signals from a human subject's neck. The collected signals are transmitted wirelessly to a receiver node using ZigBee wireless transmission technology. The received signal was preprocessed to remove the effect of white noise and the nonlinear DC offset introduced by ZigBee wireless transmission. Then, using signal processing techniques a set of important vital parameters such as heart rate, systolic blood pressure and diastolic blood pressure were extracted from the received signals. The accuracy of the extracted vital signs was validated through the use of conventional meters. To the best of our knowledge, this is the first study that locates a piezoelectric sensor in the neck. This location has two advantages: good physiological signal to noise ratio (SNR) because carotid arteries are the major blood vessels that deliver blood to the brain, they are big and thus the pressure pulse waveform obtained from them will be very clear. Furthermore, a sensor placed in the neck is less prone to motion artifact. The proven feasibility of our concept can play a very important role in e-health systems and platforms in future because it can be used to extract vital health parameters in an affordable, flexible, scalable and effective way. Those extracted parameters are needed to assess the human subject health remotely, continuously and on real-time.

P50

### **Advanced Reduction Processes as a Tool for Degradation of Pharmaceutical Drugs in Waste Water, comparison study**

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Occurrence of pharmaceuticals in the effluents of wastewater treatment plants and ground water is considered as an emerging environmental problem owing to their potential toxicological risk on living organisms even at low concentrations. Low removal efficiency of pharmaceuticals by conventional wastewater treatment plants demands for a more efficient technology. Recently, research on advanced reduction processes (ARPs) has become a hot topic, because these technologies have shown their ability to degrade efficiently most organic pollutants. The focus of the proposed research will be given to the reducing agents namely sulfite, bisulfite, persulfate, and iron(II) sulfate to see the most effective reagent that can be used to get maximum degradation of the pharmaceutical compounds under the laboratory controlled conditions. Batch experiments have been carried out to explore the effect of initial pharmaceutical compound concentrations, initial pH values of the solution, and reducing reagent dosages on the degradation efficiency under UV irradiation at 254nm conditions. After optimizing the degradation conditions, the degradation reaction kinetics was reported. Moreover, the degradation intermediates were separated, characterized, and determined using high performance liquid chromatography and tandem mass spectrometry (HPLC-MS/MS). Degradation pathways of the studied pharmaceutical drugs were proposed.

P51

**Development of HDPE/TiO<sub>2</sub> nanobiocomposites with the incorporation of different coupling agents.**

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Polymeric nanobiocomposites have established themselves as a promising class of biomaterials. However, Incorporation of hydrophobic polymer with the hydrophilic nanofiller while fabricating nanocomposites is still an issue. Chemical modification of raw ingredients is performed using alkali, silane, acetylation, benzylation, acrylation, maleated coupling agents, isocyanates, permanganate and others. The nanoparticles of our interest is TiO<sub>2</sub>, which form clumps on to polymer matrix due to it high surface energy. The graft modification of TiO<sub>2</sub> nanoparticles is conducted in order to enhance the interfacial interaction between the polymer and nanoparticle which in turn improve its dispersibility on the matrix. Second method to achieve stronger interfacial adhesion and to nullify surface incompatibility is to add polar group to non-polar polymer itself. The current paper demonstrates different chemical and physical treatments of polymer and nanoparticles used in fabrication of HDPE/TiO<sub>2</sub> nanobiocomposite followed by their characterization.



## Piezoresistive pressure sensor for medical applications

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There is a worldwide increase in the number of patients suffering from cardiovascular diseases (CVD). Cases that go undetected in the early stage introduce a delay in medication causing the heart disease to advance to a level where it is difficult to cure. The need for systems that can detect CVD in its early stages (using heart signals), while having a high sensitivity, being portable, light and cost effective is greater than ever. There are several methods in use for heart monitoring, such as seismocardiography, electrocardiography, and photoplethysmography. Recently, the focus on the at-home monitoring of the heart is increasing for long term monitoring, which minimizes risks associated with the patients diagnosed with cardiovascular diseases. It leads to increasing research interest in portable systems having features such as signal transmission capability, unobtrusiveness, and low power consumption.

Persons diagnosed with CVD are at a higher risk to their lives as compared to the normal persons, requiring continuous monitoring of health status. Portability of such systems makes it highly useful for elderly patients as this minimizes visits to clinics or hospitals. A cost effective system will emphasize the use of heart monitoring systems in low and middle income countries. Proper diagnosis reduces the mortality caused due to CVD which ensues economic up-lift of the country. MEMS sensors convert applied pressure to electrical energy by capacitive and piezoresistive sensing mechanisms. Piezoresistive sensors have DC input, simple conditioning circuits and higher output compared to capacitive sensors.

The proposed device is a piezoresistive sensor that converts mechanical energy from heart beats into electrical energy. The device consists of piezoresistive layer with two upper interconnected fractals. The major advantages provided by this device is the ease of operation, comfort (can be worn under clothes without hindering routine activities) and enabling patients to monitor their cardiac cycle at home. In addition, these cardiac cycle parameters can be transmitted to the doctor for continuous supervision and intensive care of patients.

P53

**Determination of diclofenac concentrations in human plasma using a sensitive gas chromatography mass spectrometry method**

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**BACKGROUND:** A gas chromatography mass spectrometry (GCMS) method for the determination of diclofenac in human plasma has been developed and validated.

**RESULTS:** This method utilizes hexane which is a relatively less toxic extraction solvent compared to heptane and benzene. In addition, phosphoric acid and acetone were added to the samples as deproteination agents, which increased the recovery of diclofenac. These revised processes allow clean extraction and near-quantitative recovery of analyte (approx. 89–95 %). Separation was achieved on a BP-1 column with helium as carrier gas. The molecular ion peaks of the indolinone derivatives of diclofenac ion ( $m/z$  277) and the internal standard, 4-hydroxydiclofenac ion ( $m/z$  439) were monitored by a mass-selective detector using selected ion monitoring (SIM) mode. The linear range for the newly developed and highly sensitive assay was between 0.25–50 ng/mL. The detection and lower quantifiable limits were 0.125 and 0.25 ng/mL, respectively. The inter-day and intra-day coefficients of variation for high, medium and low quality control concentrations were less than 9 %. The robustness and efficacy of this sensitive GCMS method was further demonstrated by using it for a pharmacokinetic study of an oral dosage form of diclofenac, 100 mg of modified-release capsules (Rhumalgan XL), in human plasma.

**CONCLUSIONS:** This method is rapid, sensitive, specific, reproducible and robust, and offers improved sensitivity over previous methods. This method has considerable potential to be used for detailed pharmacokinetics, pharmacodynamics and bioequivalence studies of diclofenac in humans.

### Smart Suit for Quick Skill Acquisition

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This project is an extension of our current research on neural synergy [1][2]. In short, we found that people move through their daily lives based on unique muscle patterns that are consistent with their body structures as well as how they perceive environmental inputs. Understanding body structure and modulating environmental input, therefore, may enhance and speed-up constructing these muscle patterns, which in nature may take a long time. This project aims at making use of such neural properties to introduce a smart EMG suit capable of reading muscles patterns (understanding body structure) from a certain person “e.g., subject A, professional football player” and to coach based on the obtained patterns another person “e.g., Subject B, footballer newbie” through smart vibrator suit that capable to assist the person to learn the desired pattern (modulating environmental input). This technology has wide range applications, such as skill acquisition for athletes, post-stroke patients rehabilitation, etc.

#### Reference

[1] <http://journal.frontiersin.org/article/10.3389/fncom.2013.00136/full>

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**P55**

**Metamaterial Split Ring Resonator Design for Bio-Sensing**

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and **Mousa Hussein**

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Metamaterial are artificially made electromagnetic materials consisting of periodically arranged metallic elements which are less than wavelength of incident wave in size. The materials can exhibit some electromagnetic properties which are not readily available in nature. Slotted Ring Resonator (SRR) is one type of such metamaterial. Theory of electromagnetic and microwave theory will be used to design a 2-port system capable of resonating at specific frequency, which will be implemented in bio-sensor application. High frequency simulation software is used to verify the accuracy and efficiency of the design, then a hardware will be fabricated in house, at the department of Electrical Engineering.

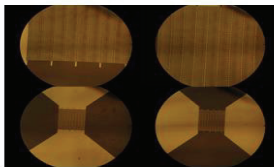
## TiO<sub>2</sub>- graphene gas sensor for the detection of CO<sub>2</sub>

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An innovative gas sensor detector topology of potential to detect several gasses simultaneously is proposed, designed and fabricated. The initial detector elaborate material is to detect CO<sub>2</sub> gas using a thin film TiO<sub>2</sub>- graphene as sensitive material. The source of operation is to measure a frequency shift corresponding to certain gas concentration. Therefore the design of this interdigital capacitive based detector has been carried out using the 2.5D sonnet software high frequency simulator. With the carbon dioxide propagation, the TiO<sub>2</sub>- graphene based detector both resonance frequency and amplitude will changed according to its concentration. This change is due to the fact that the TiO<sub>2</sub>- graphene relative dielectric constant between the metallizations fingers gaps while exposed to carbon dioxide will simply vary its characteristics. In addition to that, in presence of carbon dioxide the conductivity of the fingers changes results in the variation of amplitude. The device has been fabricated and simulated. The measurements are ongoing and will be conducted at room temperature. The choice of TiO<sub>2</sub>- graphene is its capabilities to detect combustion gases and toxic gases that could be found particularly in environmental application. Carbon dioxide capturing shows a major role in reducing the concentration of greenhouse gas emissions in the atmosphere and control the effects of global warming which has become an environmental issue of our time of life. In our system we will be developing a well-designed gas sensor using TiO<sub>2</sub>- graphene and the fabrication of the sensor. This article highlights how to detect CO<sub>2</sub> gas and reduce it from the atmosphere. Also presents simulation and experimental data to characterize the sensor. The interdigital capacitor is an element for producing a capacitor- like, high pass characteristic using microstrip lines as presented in figure 1. The TiO<sub>2</sub>- graphene film will be placed between the conductors (fingers) for accurate and fully absorption.

**KEYWORDS:** carbon dioxide, gas sensor, titanium dioxide, fabrication, TiO<sub>2</sub>-graphene, metal oxide, interdigital capacitance.



**Figure 1:** Fabrication of the Interdigital Capacitor (Butterfly patterns)

P57

### Breast Feeding Patterns among Women in Bahrain

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**OBJECTIVE:** To evaluate the status of breastfeeding among women in Bahrain and study some factors that contribute to encouraging this choice in our community.

**SUBJECT AND METHOD:** The study is a survey which was conducted during six months in 2015. Women in the postnatal wards in two major hospitals were approached. Questionnaires about the feeding pattern intended for the newborn and previous feeding pattern for the other siblings were filled by designated maternity nurses. Data was analyzed using Statistical Package SPSS Version -20.0. Odds ratio and Chi-Square were used to measure the association between variables.

**RESULTS:** The study recruited a total of 428 women, 47.0% of the women were exclusively breast feeding their newborn, and 43.5% combined both breast feeding and formula feeding. Almost 53.0% of the siblings were breast fed for 12-24 months, and 12.6% were breast fed for more than 24 months. Mothers older than 30 years old were 1.69 more likely than younger women to breast feed their children for a period longer than 12 months (P-value=0.005). The odds of women who had three or more children was 1.98 times more likely compared to women who had less than three children to breast feed longer than 12 months (P-value=0.001).

**CONCLUSION:** 47% of women in our study exclusively breast feed their children. The main factors contributing to their choice of exclusive breast feeding are the mother's age and having three and more children. Hence the need to support and educate the younger mothers.

P58

**To study immune dysregulation in children's with autism spectrum disorder (ASDs) among UAE nationals**

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Autism spectrum disorder (ASD) is a complex developmental disorder characterized by impaired speech, social interactions and repetitive aberrant behaviors. Attention deficit hyperactivity disorder (ADHD) is defined by National Institute of Mental Health as “difficulty staying focused and paying attention, difficulty controlling behavior, and hyperactivity (over-activity) symptoms”. Food allergy (FA) is an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food. Food allergens are parts of food or ingredients within food (usually proteins) that are recognized by immune cells.

The presence of FA has been widely speculated (approx. 12% to 13%) based on self-reported data) along with high frequency of GI symptoms in children with ASD and ADHD. Owing to tremendous changes in dietary patterns, habits and lifestyle among UAE population, it's imperative to investigate the role of food habits or FA in autistic and hyperactivity children. Till now no scientific research has been performed regarding the incidence of FA and ASDs/ ADHD among UAE nationals.

The objective of this study is to determine relationships between various foods allergens and levels of immune-regulatory & inflammatory cytokines in children's with ASDs and hyperactivity disorder. A sample of 100 patients with ASD will be recruited randomly across the allergic clinics in UAE. The type of allergen will be determined quantitatively using skin prick test. The immune responses (serum immunoglobulins) and levels of inflammatory cytokines (IL-2, IL-4, IL-5, IL-6, IL-10, IL-13, IFN- $\gamma$ , TGF- $\beta$ 1 and BDNF) will be determined in peripheral blood mononuclear cells (PBMC) using two-antibody sandwich ELISA. Quality of life (QOL) will be assessed by a Short form-36 scores, both before and after medical intervention.

The outcomes are expected to cast a new insight about the risk factors of autism, which would enable healthcare providers to identify and eliminate food allergens that may contribute to trigger the aggressive behavior improves cognition and behaviors, management plan, quality of life and standards of care among such patients in UAE.

P59

**Systematic review of effectiveness of exercise intervention in preventing falls among community dwelling elderly persons**

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Falls are a public health problem among the elderly population globally. Thus, it is important to evaluate interventions that might be effective in reducing falls among the elderly.

**OBJECTIVES:** This study aims to evaluate the effectiveness of exercise on falls and fall prevention in community dwelling elderly persons based on recent clinical trials and systematic reviews. This study also aims to present an exercise program that is most beneficial that can be recommended and implemented in home and community settings. This will provide justifications to policy makers to improve fall prevention programs.

**METHODS:** A systematic literature review of clinical trials was performed considering articles published from 2005 to 2015 and accessed through PubMed, peer reviewed medical journals and the Cochrane database. Lists of references from relevant articles were also followed. All papers were in the English language. Included in this study were high quality review articles and recent clinical trials that used exercise or physical activity as an intervention and balance or muscle strength as one of the outcome measures. The search for recent clinical trials retrieved 12 abstracts and only 4 articles met the criteria. The earliest study was published in 2008 and the most recent was published in 2014.

**RESULTS:** Findings suggest that exercise intervention either delivered in individual or group format can significantly reduce the fall rate and risk of falling in the elderly.

Keywords: fall, prevention, exercise, physical activity, elderly



P60

### **Combining GIS application and climatic factors for mosquito control in Eastern Province, Saudi Arabia**

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The influence of mosquitoes on human health and well-being is greater than any other insects throughout the world. Diseases transmitted by mosquito vectors are among the major contributors to human morbidity and mortality in each parts of the world. Climatic factors (temperature, relative humidity and rainfall) affect the distribution and abundance of mosquito. Mapping larvae breeding habitat using GIS technology makes the mosquito control activities easier, effective and efficient than the traditional methods of mosquito control. This study aims to map mosquito larvae breeding sites using GIS application and determine the effect of climatic factors (temperature, relative humidity and rainfall) on mosquito distribution and abundance in Eastern Province, Saudi Arabia. The data pertaining to larval and adult mosquito abundance/distribution and climatic factors were collected for the study period of 2014. Bivariate and multivariate analyses were performed to determine the relationship between mosquito abundance and climatic factors (temperature, relative humidity and rainfall). The employment of GIS with GPS facilitates the identification and mapping of larvae breeding sites in the study area. The result showed strong negative correlation between mosquito abundance and temperature while strong positive correlation with relative humidity and moderate positive correlation with rainfall. Low mosquito abundance was observed at high temperatures whereas high and moderate mosquito abundance was observed at high humidity and during rainy months, respectively.

P61

**Antimicrobial Activities of Middle Eastern Thyme against *Cronobacter sakazakii*****Zaynab Murdy Zatar**-and Mutamed Ayyash*Department of Food Science, College of Food and Agriculture, UAE University, Al-Ain, UAE.*

The present study was carried out to determine the antimicrobial activity of thyme. There are many studies have shown that the thyme has antimicrobial effect on many types of bacteria and pathogenic. But the new thing here in this study was using water to obtain thyme extracted, water extraction, (by adding boiling water on the thyme's leaves), where previous studies used the essential oil of thyme (Eos). Then measure its antimicrobial on bacteria called *Cronobacter sakazakii* by measuring the surface plate methods. First, thyme was prepared in a traditional way, to see the effect of thyme in general. The experience done on two types of thyme (fresh green from the UAE (ThUAE), and thyme crusty from Jordan (ThJ)), which used three different concentrations of each type of thyme (50g, 25g,

12.5g, of ThUAE and 16g, 8g, 4g, of ThJ) all per 200 ml of distilled boiling water. Also, effect of boiling time on antimicrobial of thyme was tested (applied on 0, 5, 10 minutes boiling). In addition to testing the effect of different initial number of bacteria. We get good results at the end of the study, where the antimicrobial effective of water extraction of both thyme on *Cronobacter sakazakii* was very clear, but the effect was most evident in the (ThJ) in the highest concentration (16g / 200ml and in a shorter boiling time (0 min.)). *Cronobacter sakazakii* were chosen because it found more in infant formula, and also thyme is a material nature has no side effect and at same time can be left with milk and use as flavored addition to the product.

P62

## **Dynamics of Tumour-Immune System With Immuno-Chemotherapy and Optimal Control**

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In this presentation, we present a mathematical model with optimal control variables to describe the dynamics of tumour-immune interactions in presence of immuno-chemotherapy treatments. The role of interleukin-2 (IL-2) in stimulation of the effector cells is considered. Discrete time-delays are considered to justify the time required to stimulate the effector cells and time-needed for the effector cells to develop a suitable response to the tumour cells. The optimal control variables are incorporated to identify the best treatment strategy with minimum side-effects by blocking the production of new tumour cells and keeping the level of normal cells above the average of its carrying capacity. Pontryagin's maximum principle is applied to characterize the optimal controls. An algorithm is suggested to approximate the solution of the optimal control problem by solving the state system forward and adjoint system backward in time. The numerical simulations show that the combination of immuno-chemotherapy protocol reduces the tumour load in few months of therapy.

**KEYWORDS:** DDEs; Hamiltonian; Immuno-chemotherapy; Optimal control; Time-delay; Stability; Tumour cells

P63

**Association of demographic and environmental factors and Toll-Like Receptors (TLR)-2, -4 and -9 with Asthma among Emirati Patients**

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There is limited research publication on asthma in the United Arab Emirates. The prevalence of physician-diagnosed asthma was 13%, especially among schoolchildren. Asthma is a very common and widely spread chronic disease in the UAE, gender or age differences are not observed in reported asthma symptoms in young adults.

The main aim of this research is to study the genetic variations in natural immunity and its association with asthma in the citizens of the United Arab Emirates. Information on asthma history, home and work conditions in addition to the physical examination will be obtained for each patient. The study also includes obtaining clinical and carrying out blood tests to evaluate the asthma condition and the possible association of genetic factors. The patients will be investigated at Al Ain Hospital. The results of this study will hopefully clarify the risk factors associated with asthma as seen in UAE and provide the first information on the genetic factors of natural immunity that is related to asthma in UAE.

P64

## Sequences at the 5' End of the MMTV Genome Affect Regulation of Gene Expression

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Nuclear export, dimerization, and packaging of genomic RNA are critical steps in retroviral life cycle. Consistent with this assumption, RNA packaging signals ( $\psi$ ) of some retroviruses have been shown to play an important role in nuclear export of gRNA. For example, in human immunodeficiency virus (HIV), a second putative Rev responsive element (RRE) has been proposed at the 5' end of the viral genome that overlaps with  $\psi$  and mutations within this region have been shown to affect both gRNA transport and packaging. In the mouse mammary tumor virus (MMTV), the 3' Rem responsive element (RmRE) is present in all known MMTV mRNAs; however, it does not control RNA export. Thus, it has been hypothesized that a second RmRE could be present at the 5' end of the viral genome, overlapping the  $\psi$ , and may play a role in both gRNA nuclear export and packaging by providing a means to distinguish between the unspliced from the spliced mRNAs. The 3' RmRE, on the other hand, could facilitate translation of all other mRNAs, including the unspliced RNA.

To address this hypothesis mutations were introduced between the major splice donor (mSD) and Gag ATG since this region should exclusively be present only in the unspliced RNAs. These mutant genomic clones were tested in transient and stable transfections to determine their effect on nuclear export of full length mRNA and Gag proteins. Our preliminary data suggest defects in RNA transport and/or stability, resulting in loss of Gag expression in some of the mutants. If confirmed, these data should reveal that like HIV-1, MMTV contains an RNA structural element at the 5' end (additional RmRE) which helps regulate gene expression by facilitating the nuclear export and/or stability of unspliced RNA.

P65

**Pancreatic Islet Localization of the Novel Endoplasmic Reticulum Protein,  
TTMP**

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**Introduction:** We previously cloned a novel growth-related gene in pancreatic cancer. The gene product is a heavily glycosylated 217 amino acid type II transmembrane protein localized to the endoplasmic reticulum. We have named it TPA-induced transmembrane Protein (TTMP). TTMP is expressed in several human tissues and expression is decreased in cancer. TTMP has no functional domains that suggest similarity with any other known protein. Forced transient expression of TTMP slows growth of pancreatic and HeLa cancer cells, while siRNA knockdown of TTMP expression increases cancer cell growth. Growth inhibitory effects of TTMP are associated with G1-phase cell cycle arrest, hypophosphorylation of the Rb protein and increased expression of interferon (IFN)-responsive genes, including transducer and activator of transcription 1 (STAT1).

**Methods:** Polyclonal antibodies to both the C- and N-terminal ends of human and rat TTMP were raised in rabbits and purified by affinity chromatography. Antibodies were used to investigate the cellular localization of TTMP in normal rat and human pancreas by immunohistochemistry and immunofluorescence.

**Results:** We expected to see localization of TTMP in the exocrine pancreas, particularly in the ductal cells. Surprisingly, in rat pancreas TTMP was exclusively localized in the periphery of the islets of Langerhans. Double staining showed no colocalization with either glucagon or insulin. However, preliminary studies have revealed co-staining of TTMP and somatostatin in the same cells in the periphery of the islets. Islet localization of TTMP was confirmed in normal human pancreas, but no staining was seen in islet tumors.

**Conclusions:** The unique endoplasmic reticulum transmembrane protein, TTMP is localized in the pancreatic islets in rat and human pancreas. This localization suggests that the protein may play a metabolic role and may be important in diabetes or other metabolic diseases.

## Mapping non-infectious diseases in a UAE desert city

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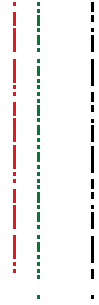
### Abstract

**Keywords:** Al Ain city, non-infectious diseases, planning, map, health

This research study makes use of the geospatial data mapping facilities of a geographic information system (GIS) for highlighting the spatial extent of diseases and their exact geographic locations. GIS use in the field of medicine is spreading quickly as an aid tool for community health practitioners. The objectives of this study are to utilize a GIS system for mapping the spatial and geographic distribution of the non-infectious diseases among the residents of different neighborhoods in Al Ain city and their relationships with the surrounding land use, land cover and life style. For this task survey questionnaires were distributed among the different residential areas of Al Ain city to identify the distribution of non-infectious diseases and their geographic locations. Based on the survey results a GIS was utilized to develop geospatial maps identifying the residential neighbourhoods of the frequency of occurrence of non-infectious diseases. Similar maps were developed for land use, land cover and recreational facilities. Correlations between the spatial distribution of non-infectious diseases occurrence and the surrounding environments, land use, land cover and health clubs were developed. Maps analysis shows that the highest ratio is for the diabetes, and the lowest for the heart diseases in the different neighborhoods in Al Ain.







***SURE ABSTRACTS***

**SP1**

**Numerical solvers for Bio-informatics problems using Neuro-Heuristic methodologies**

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In this project, Biomathematics problems based on the modelling of electrical activity of human heart is taken for the investigation. A reliable numerical solver method based on neural network is used to obtain an approximate solution of a model of heart based on nonlinear oscillatory Vander Pol (VDP) equation. Electrocardiogram test (EKG) from one of the hospitals in UAE will be collected to detect and record the heart's electrical activity. Comparison with EKG for healthy people and people have heart problems. In addition, comparison with other numerical results in the literature will be studied.

## SP2

### Amino-acid based sensor for fluorometric quantification of zinc ions in waste water

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An imine (SAL-HIS) derived from histidine and salicylaldehyde was synthesized and used as a sensor to detect zinc ions in aqueous samples. UV and fluorescence spectroscopies were used to find the selectivity of SAL-HIS towards common metal ions. It was found that SAL-HIS was selective towards  $Zn^{2+}$  and  $Al^{3+}$  ions. Therefore, the complex formation of SAL-HIS with  $Zn^{2+}$  and  $Al^{3+}$  ions were thoroughly studied with respect to stoichiometry, formation constant ( $K_f$ ), thermodynamics and limits of detection (LOD) and quantitation (LOQ). The stoichiometry was determined using the Job's plot and the Benesi-Hilderbrand equation and both complexes were 1:1 ratio. The formation constants ( $K_f$ ) for SAL-HIS- $Zn^{2+}$  and SAL-HIS- $Al^{3+}$  were obtained by titrating SAL-HIS against  $Al^{3+}$  and  $Zn^{2+}$  were found to be  $10.6 \times 10^3 M^{-1}$  and  $25.2 \times 10^3 M^{-1}$  respectively. The thermodynamic parameters of the binding process were also determined by calculating  $K_f$  at different temperatures. The Van't Hoff equation was used to calculate  $\Delta H$ ,  $\Delta G$  and  $\Delta S$ .  $\Delta H$  of SAL-HIS- $Al^{3+}$  is  $-51.5$  kJ/mol (exothermic) and  $\Delta H$  of SAL-HIS- $Zn^{2+}$  is  $+109$  kJ/mol (endothermic). Gibbs free energy determination ( $\Delta G$ ) showed that the reaction with  $Al^{3+}$  was non-spontaneous ( $+24.2$  kJ/mol) and spontaneous with  $Zn^{2+}$  ( $-21.7$  kJ/mol). The possibility of using SAL-HIS for detection and quantification of both  $Zn^{2+}$  and  $Al^{3+}$  ions in water was also explored. The conditions used  $70 \mu M$  of SAL-HIS in  $0.7\%$  DMSO-water in  $700 \mu M$  Tris buffer (pH 7.7). The LOD and LOQ for  $Zn^{2+}$  and  $Al^{3+}$  were as follows:  $LOD_{Zn^{2+}} = 16$  ppb,  $LOD_{Al^{3+}} = 10$  ppb,  $LOQ_{Zn^{2+}} = 42-2100$  ppb,  $LOQ_{Al^{3+}} = 30-336$  ppb. The interference of common cations and anions were also studied.

**SP3**

**APRMS: Automated Program E-Review Management System**

**Athra Al Khatri**

*College of Information Technology, UAEU*

Program review has been recognized to be a common practice conducted in most renowned Universities worldwide. This exercise usually ensures that programs are up to date, meet high quality standards, continuously respond to changes, and enforces continuous improvements. It is a cycle that involves different stakeholders ranging from program chairs, deans, program review committee members, and internal/external examiners. Managing such multi-process requires an automated system that streamlines these activities and provides efficient management and coordination among different actors. However, very few developments have been done to support through a system main activities and processes of programs review through its lifecycle. In this project, we will design and develop the APRMS: an Automated Program Review Management System to support and manage the program review development in UAE University through a set of electronic features and tools. APRMS will handle different activities including for instance: granting access rights to the designed person(s), engendering reminders whenever needed, following up on duties achievements, providing guidelines, enforcing administrative rules, closing the evaluation loop, and generating dedicated reports/recommendations for better decision making. We provide in addition, to a Web-based automation of the review and evaluation process, a systematic approach to ensure standards and review guidelines and practices.

SP4

### **Pinitol Mitigates Oxidative Stress and Inflammation Isoproterenol-Induced Myocardial Injury in Rats**

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**OBJECTIVES:** Myocardial infarction (MI) is becoming a leading cause of morbidity and mortality worldwide. Thus, preventive and/or therapeutic interventions for ischemic heart disease i.e. MI are needed. The present study aimed to investigate the cardioprotective potential and possible mechanism of pinitol (PNT), a molecule of natural origin. PTN present in many plants has garnered attention recently due to its potent antioxidant and anti-inflammatory activities.

**DESIGN & METHODS:** This study used a clinically relevant animal model of isoproterenol (ISO)-induced myocardial infarction in rats. ISO is a nonselective  $\beta$ -adrenergic agonist produces MI like human MI involving sub-endocardial ischemia, hemodynamic dysfunction and contractile impairment. Rats were pretreated for 7 days with PTN (10 mg/kg/day, i.p.) before inducing myocardial injury by subcutaneous injection of isoproterenol (85 mg/kg body weight) for two consecutive days at an interval of 24 hours.

**RESULTS:** Rats given ISO showed impaired hemodynamics, elevated enzyme levels of cardiac injury markers (creatine kinase-MB isoenzyme and lactate dehydrogenase), increased lipid peroxidation (malondialdehyde) and rise in the level of pro-inflammatory cytokines (interleukin- $1\beta$  and tumor necrosis factor- $\alpha$ ), and oxidative stress (decreased glutathione), when compared with normal control. Pretreatment with PTN significantly improved hemodynamics, inhibited lipid peroxidation and attenuated rise in inflammatory markers and prevented glutathione depletion. The preliminary data suggest cardioprotective effect of the PTN and could be attributed to its anti-lipid peroxidative, antioxidant and anti-inflammatory properties.

**CONCLUSIONS:** Result suggested that PTN possess protective potential in animal model of ischemic heart disease.

**ACKNOWLEDGEMENT:** The work has been supported by the sure grant form UAE University.

SP5

### **The impact of VAT on the UAE international trade**

**Ibrahim Mhanna\***, **Younes Benhammouda\***, Sahaab -Ul-Salaam, Abderrahmane Amirat,  
*Youssef Boulaksil*

The United Arab Emirates recently decided to introduce Value-added Tax (VAT) in 2018. It is expected that soon a GCC-wide agreement will be made to align the VAT introduction in all GCC countries. It is an important decision in ensuring a stable economy, which is less reliant on oil countries. VAT has become a very popular way of taxing consumption by many governments in the world. While VAT policies may slightly differ between different countries, their common structure is that difference between the seller's purchase price and the resale price is taxed. The objective is that ultimately only the end consumer is taxed.

Despite the fact that VAT has been widely adopted by many countries, it is remarkable that little is known about the impact of VAT on country's international trade and logistics. The objective of this project is to study the impact, which is not only academically interesting, but also currently an actual topic in the UAE. We collected relevant, country-specific macro-economic data from different sources that allowed us to assess the impact of VAT adoption on the international trade and logistics.

SP6

## **Knowledge, Practices and Attitudes toward Cervical Cancer Screening among Female Adults in AlAin, United Arab Emirates**

**Mouza Al Shebli**, Lamia Al Senaidi, Iffat Elbarazi, Yusra ElObeid, Fatma Al Maskari  
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**BACKGROUND:** Cervical cancer is highly preventable cancer if its screening program is followed as recommended. Cervical cancer screening is listed under Wiqaya program and is highly recommended for all eligible female nationals and are is of charge. Furthermore, all school girls above the age of 12 years in Abu Dhabi Emirate were encouraged to receive vaccines against Human Papilloma Virus through a national vaccination program that was launched in 2013. Spreading knowledge and awareness toward cervical cancers screening and vaccination will definitely help to improve the practices of the community toward the cancer screening.

**AIM:** To assess the knowledge, attitudes and practices of Al Ain women population regarding cervical cancer screening programs and to identify the barriers.

**METHOD:** A cross sectional study was conducted in various primary care centers in AlAin city using an interviewer administered validated questionnaire. A random sample 336 females were recruited. The study protocol was approved by Al-Ain Medical District Human Research committee and written informed consent was obtained from all study participants.

**RESULTS:** The study showed that the Knowledge, attitude and practices toward cervical cancer screening was considerably poor despite a good knowledge about cervical cancer in general. This inadequate knowledge can be important barriers to improve screening uptake among females population in this country.

**CONCLUSION AND RECOMMENDATIONS:** There is strong evidence from this current study for an urgent need for awareness campaigns in the community about the importance of and availability of cervical cancer screening program. Policy makers need to invest in community awareness and education campaigns that target all different community members of all ages, education and backgrounds to improve their knowledge about the importance and availability of cervical cancer screening in the country.

SP7

**Knowledge, Attitude and Practices toward Colorectal Cancer Screening in AlAin, United Arab Emirates**

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*Institute of Public Health, College of Medicine and Health Sciences, United Arab Emirates University*

**BACKGROUND:** Colorectal cancer is the second leading cause of cancer deaths in the United Arab Emirates. Colorectal cancer screening is effective in lowering the incidence and mortality rates of this disease. Lately a colorectal screening program was launched by Abu Dhabi Health Authority (HAAD) in August 2014 targeting all males and females aged 40-75. It consists of colonoscopy every 10 years and fecal immunochemical test every two years. It is expected that this screening program is facing some challenges such as low participation rate and poor adherence.

**AIM:** To assess the knowledge, attitudes and practices of Al Ain adult population regarding colorectal cancer screening programs and to identify barriers to screening.

**METHOD:** A cross sectional study was conducted in various primary care centers in AlAin city using an interviewer administered validated questionnaire. A random sample of 500 adults (336 female and 160 males) was recruited. The study protocol was approved by Al-Ain Medical District Human Research committee and written informed consent was obtained from all study participants.

**RESULTS:** The study showed that the Knowledge, attitude and practices toward colorectal screening was very poor despite a good knowledge about colon cancer in general. Barriers that were identified were mostly due to lack of knowledge about the availability of screening programs.

**CONCLUSION AND RECOMMENDATIONS:** These findings should guide the development of interventions to encourage screening uptake and reduce colon cancer related deaths among the population. Policy makers need to invest in community awareness and education campaigns that target all community members of all ages, education and backgrounds to improve their knowledge about the importance and availability of colorectal screening in the country.



SP8

## Oil Spills in the Gulf Region

Prof. Fathi M. Allan

**Mohammad Abumosameh**, Mohammad Al Koz, Annas Farah, Faleh Aladimat

Oil spill means the release of a petroleum hydrocarbon liquid into the ocean or coasts due to human activities or accidents, and it is form of pollution. There are many physical and chemical processes happening to the oil spill, collectively known as weathering processes . In this study a 2-D equation was used to describe the oil slick movement on water surface. It considers horizontal dispersion, advection, diffusion and evaporation. Also a program called GNOME has been used to predict the trajectory of the spills. We use Mathematica program to solved and studied equations in this study.

SP9

**Creation, Uses and Analysis of high resolution Digital Elevation Model (DEM)  
for selected areas in AL Ain**

**AbdulAziz Alshehhi**

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Contour lines at 10m contour interval were digitized from existing 1/50,000 paper topographic maps to create a Digital Elevation Model (DEM). Sample elevation points were collected using a regular grid (Fishnet) created in ArcGIS 10. The size of the Fishnet cell was 250m x 250m at the scale, producing a total of 1600 points covering a study area of 10 x 10 km size near Al Ain airport. After a series of geo-processes in ArcGIS 10, a dataset of derived data was created including contour lines, grid of regularly spaced spot heights, a Triangulated Irregular Network (TIN), other raster surfaces produced various interpolation methods such as Kriging, IDW or Spline algorithms. The 3D Analyst Extension was used to combine the various surface layers in a 3D scene hence producing different 3D views of the terrain. The output of the SURE2016 demonstrated the power of GIS to study Earth surface in three dimensions simulation, allowing for further investigation and more realistic insights in to our spatial data for further analysis.

Finally, the main project outcomes were: the creation of a TIN and DEM for a selected area near Al Ain city besides a cohort of very well trained students on how to use RS and GIS techniques for Terrain Analysis, 3D earth surface rendering and earth surface processes analysis and management.

SP10

**Stratigraphic study of the surface Middle to Upper Eocene Dammam Formation (48-34mya) as a groundwater aquifer and for oil exploration**

Miyra Aljabri, Ali Almntaser, **Falah Sheikh** and Said Khouya, Osman Abdelghany  
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The Dammam Formation was originally described from the Dammam Dome in Saudi Arabia. It is exposed in various localities throughout the UAE. In this study, more than 20 samples of rocks and fossils from the Dammam Formation were collected and examined to obtain lithological and palaeontological data. Smaller forams (*Hantkenina* sp. and *Cribrohantkenina* sp.) and larger forams (*Asterocyclina ?pentagonalis*) were recovered from the Dammam Formation, Al-Ain and El Faiyah areas. Lithostratigraphic and biostratigraphic correlations are proposed based on this data. Another outcome of this study is the recognition that the Dammam Formation functions as a significant groundwater aquifer, due to its superior secondary porosity. It may also provide a reservoir for oil accumulation.

## SP11

**The cognitive representation of Arabic proper names: A masked priming investigation**

Amira Bakhit, Hessa Al Mazrouei, Ruwayyeh Al Mazrooei, Ryaan Zeyoudi & Sami Boudelaa  
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Proper nouns refer to an individual person (e.g., *John, Marta, Brent*), place (e.g., *London, Dubai, York*), or organization (e.g., *Oxfam*) and are standardly thought to be either unique and meaningless labels, or conceptually specific concrete labels from a subordinate level of a conceptual hierarchy. A common noun, on the other hand, is one that refers to a general concept or entity (e.g., *table, war, maid*). In this study, we ask how proper nouns are represented by and processed in the brain. More specifically, we focus on Modern Standard Arabic, and set out to determine if a proper noun like *بليغ* [baliig] meaning *eloquent* in the full name *بليغ النجار* [baliig Anajjaar] is decomposed into the root {blg} and the word-pattern {faEiil}, or whether it is stored whole like Indo-European proper nouns. To address these questions we used masked priming combined with a lexical decision task to explore facilitation between a proper noun prime and common noun targets co-varying in morphological and semantic relations. According to the *Obligatory Morphological Decomposition* account (Boudelaa, 2013, Boudelaa & Marslen-Wilson, 2015), Arabic proper nouns have identifiable roots and word patterns and should behave just like common nouns and generate priming among words sharing a root regardless of semantic transparency. The results corroborate this prediction and show statistically significant facilitation not only among primes and target pairs sharing a root and a transparent semantic relationship (e.g., *بلاغ-بليغ النجار* [baliig Anajjaar]-[balaagah] *eloquent-eloquence*), but also and more importantly among prime-target pairs sharing a root and an opaque semantic relationship *بلوغ-بليغ النجار* [baliig Anajjaar]-[balaagah] *eloquent-puberty*). Matched semantic and phonological controls showed no evidence of facilitation. The implications of this study are twofold. First they constrain current models of morphological processing and conceptual knowledge representation. Second, they suggest that Arabic proper nouns are not processed or represented any differently than common nouns leading to the further neuropsychological prediction that patients with anterior temporal lobe damage, where proper nouns are thought to be represented, should not evidence any more deficit on proper noun processing than on common noun processing.

SP12

## **Innovative Reading Strategies Integration in Teaching UAEU Students**

**Ghadah Al Murshidi** and Ahmed Al Zaabi

*Curriculum & Method. of Instruct. College of Education, UAEU*

The purpose of this study was to investigate the perceptions of UAE University students about the use of technology and the videotaped story workshop method in conducting their research in English courses and improving their reading in innovative way. This is an example of curriculum and instructional method that integrates the four skills (Speaking, listening, reading and writing) to conduct research. It enables the teacher to engage students of different majors. The method provides means of effective classroom management while actually raising the demand on the students to conduct their research. Students are engaged and enjoy this form of learning. The research method of the study is qualitative which is interviewing 30 students. Content analysis is used to interpret the data. Interview results show students' perceptions. This paper concludes with recommendations to facilitate the use of technology in facilitating reading and research in the field of teaching English language.

**SP13**

**Some divisibility properties of binomial coefficients and q-binomial coefficients**

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A central problem in number theory is to find prime factorization and divisibility properties of positive integers and sequences of positive integers such as the sequence of binomial coefficients. Despite the importance of binomial coefficients and their wide range of applications in many branches of mathematics, only few is known about divisibility properties and prime factors. The classical approaches which have been used to study the properties of binomial coefficients include number theory combinatorics along with algebraic manipulations. In this project we shed light on the divisibility properties of binomial coefficients by means of the theory of q-series.

SP14

**Development of a low cost cement free geopolymer concrete using locally sourced industrial byproducts and dune sand**

**Moustafa Mansour**

*Civil & Environmental Engineering, COE, UAEU*

Concrete is the most used material, which required large quantities of Portland Cement. Ordinary Portland Cement production is the second only to the automobile as the major generator of carbon di oxide, which polluted the atmosphere. In addition to that large amount energy was also consumed for the cement production. Therefore, there is a strong need for a more energy-efficient and green-binder system for concrete. Geopolymer concrete (GPC) derives its strength from an inorganic binder. It is an innovative construction material which shall be produced by the chemical action of inorganic materials. This is resulted from a geosynthetic reaction of aluminosilicate minerals in the presence of strong alkalis. An overview of an experimental program appraising the suitability of GPC for use in gulf region is reported, followed by a brief account on key factors affecting the performance of GPC. The geopolymerization of aluminosilicate minerals from industrial wastes, such as fly ash and ground granulated blast furnace slag (GGBS), Fly ash is rich in silica and alumina reacted with alkaline solution produced aluminosilicate gel that acted as the binding material for the concrete

**SP15**

**Technical and environmental assessment of Air conditioner remanufacturing**

**Aiman Ziout**

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This research investigate the technical and environmental consequences of remanufacturing of existing Window-type Air Conditioner (AC), the research identifies the minimum technical changes required on remanufactured AC due to the migration from current refrigerant R22 to new refrigeration R410A. The research also assesses the environmental impacts of AC remanufacturing process. Throughout the research, life cycle assessment is conducted, in addition to that a detailed plan for the whole remanufacturing processes, needed resources and resulting environmental impacts are identified. The technical assessment is conducted using EES software through implementing refrigeration cycle equations in addition to individual components' equations. Moreover, the environmental impacts assessment is conducted using GaBi software. Throughout the evaluation of the environmental effects that result from the refurbishing process, many variables were considered, and that would include; remanufacturing processes such as: disassembling, cleaning, testing, shipping of units, and resources consumption. Appropriate approximations were selected to fit with the available database of the program. The results showed that the minimum change needed to migrate from R22 to R410A is changing the compressor while changing the other components are not necessary. Yet, the migration would cause considerable reduction in cooling capacity. Also, the system requires higher R410A mass compared to R22 mass to have sufficient working pressure.



SP16

**Spontaneous' Amendments of Public Housing Units in Al Ain, UAE A Study of Architectural Morphology, Construction Methods and Environmental Conditions.**

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*College of Engineering, UAEU*

Most of the public housing models in the UAE have been either 'rigidly' designed without considering future amendments and extensions or allowed for just limited and pre-planned unified extensions. In response, residents have embarked on 'informal' self-initiated changes and/or extensions to their houses. The research main objective is to investigate the architectural morphology (shape, spatial relationship, volumetric size), construction methods and materials, and environmental conditions of these 'spontaneous' amendments with the aim to derive lessons out of these investigations that help bridge the gap between the users' actual needs on the one hand and the 'official' or 'formal' pre-designed models for expansions as developed by local authorities on the other hand.

The research project adopted qualitative 'case study' method, which permitted deep explorations of the residents' actions through field studies in public houses at least twenty years old located in selected public housing neighbourhoods in Al Ain city to ensure being representatives of residents' amendments over a long span of time. Al Ain was selected as it has witnessed intensive development of public housing projects in the recent decades and because it is accessible by the project investigators. Afterwards, the research project examined the pre-designed limited models for extensions as proposed by the local housing authorities in Al Ain. The research tools included field observations to record residents' actions using photographs and hand sketches besides 2D and 3D CAD drawings. The analytical method was used in identifying expansion patters deduced from the field surveys.

SP17

## Android and iOS Smartphones Forensic Analysis

**Meera AlKwaiti**

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Smartphones are ubiquitous mobile devices. They are powerful pieces of technology wrapped into small packages, capable of tracking the communications, locations, and contacts of their users. Therefore, they have the potential to contain valuable forensic information that could hold in legal prosecutions

According to a study, the average smartphone's users spends over an hour using their phone for something other than calling or texting. The applications being used have the potential to give the forensic analysts a deeper, more personal look into the lives of the suspects in question, beyond what has been previously available to them when cell phones were simply a way to call your contacts on the go.

With the increase popularity of smartphones, the importance of researching and perfecting methods of forensic analysis of smartphones is becoming more and more prominent. As these devices become more popular, criminals have more access and opportunity to use them for fraudulent activities. Smartphones could be used for many criminal activities, such as terrorist activities, financial crime, committing email fraud, pornography, illegal substance related communications, harassment via texting, software theft, etc. Since smartphones can facilitates such usage, the data stored on them could be a valuable asset to a forensic analyst conducting an investigation

Although smartphones have a lot of personal data, it is hard to access. Because of the wide variety of devices currently available, all with different hardware and software, there is a lack of standardized methods to retrieve this data. Companies use vastly different media to store the data, differed directory structures, runtime environment, kernel and libraries, different file system structures, and different operating systems. Even devices made by the same manufacturer could have different size or type of data storage. This makes smartphones more complex to forensic examiner.

With all the differences in smartphones, researchers are working hard to make smartphone forensics easier. As Android and iOS's popularities are growing, people are getting more interested in them, allowing room to develop new ways to gather forensic data on the multitude of such smartphones.

The main objective of this paper is to investigate how to forensically analyze smartphones, focusing on the most popular smartphone platforms (Android and iOS), and to propose a standardized method to conduct smartphone forensics and retrieve forensic information about a person usable in the courtrooms.

SP18

## **Incorporating Lightweight Concrete in Bridges for Potential Economic and Sustainability Benefits**

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The Municipality of Al Ain City, UAE, has reserved Dh10 million to restore four ill maintained bridges and revealed plans to build two new bridges. Along this line, the National Cooperative Highway Research Program (NCHRP) and the American Association of State Highway and Transportation Officials (AASHTO) are promoting the use of lightweight concrete (LWC) in bridge concrete girders and decks for potential economic and sustainability advantages resulting from self-weight reduction. However, for bridges with LWC decks supported by steel girders or LWC box girder (multi-cell box) bridges, it is anticipated that live load induced vibrations will be higher than those of normal weight concrete (NWC) counterparts because the modulus of elasticity of LWC can be substantially lower than NWC. Accordingly, this research proposes a finite element analysis-based study aiming at comparing vibration behavior of LWC and NWC bridge superstructures. Suggested improvement in vibration resistance of bridge LWC superstructures after adding 5 cm-thick bonded concrete overlay was evaluated for verification. Extensive modal analyses were performed to obtain and compare various model frequencies and mode shapes of the LWC and NWC bridge superstructures. Based on the analytical findings, recommendations regarding using LWC in bridges above were provided.

**SP19**

**Abu Dhabi Environment Vision 2030: Are Abu Dhabi Organisations up to it?**

**Ahmed Abdel-Maksoud, Ahmad Jamal Elkassem, Bader Juma Saeed Alkaabi, Yousif Faisal Yousif Ahmed**

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Abu Dhabi (AD) Economic Vision 2030 aims at ensuring environmental sustainability in AD. This particular issue has received attention of AD Government and the AD Executive Council has requested the Environment Agency – Abu Dhabi (EA-AD) to develop AD environment Vision 2030 policy agenda as an integral part of AD Government’s policy agenda framework .In order to achieve the Environment Vision 2030, EA-AD identified specific imperatives which need be delivered by specific sectors. It also stressed on other important imperatives such as the need for better data and statistics.

However, lack of data is recognised by EA-AD as a critical hindering factor in achieving its 2030 Environment Vision. EA-AD stressed on the need to rectify this data collection gap through stakeholders’ cooperation. The objective of this study is to address the extent of environmental related data made available by AD organization. In this study, we investigate the extent of environmental performance disclosure by the AD surveyed organisations.

We performed content analysis on annual reports of 94 manufacturing firms operating in UAE (for 2015 financial year). In general, our findings indicate a poor score of environmental performance disclosure of the surveyed companies across UAE. Though, the average total environmental disclosure score for companies operating in Abu Dhabi was the highest amongst all other emirates. Interestingly, the average total environmental disclosure score for non-listed companies was higher than that of listed companies in the sample. Our findings are contrary to expectations in that listed companies could be more keen on environmental performance disclosure, hence our findings merit future investigations. Findings of this study are expected to contribute to our understanding of the state of the art of environmental performance disclosure in UAE firms, in particular in Abu Dhabi.

**Keywords:** Abu Dhabi Economic Vision 2030, environmental disclosure, manufacturing firms, Ministry of Climate Change and Environment, UAE.

SP20

**Returns and volatility spillovers between oil price and sectoral stock prices in  
UAE: A hedging effectiveness**

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AlMaghaireh**

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In this paper, we attempt to extend the literature on the oil-stock nexus by examining time-varying correlation and dynamic volatility spillover between crude oil prices and sectoral stock returns in the UAE stock markets. The direction of spillovers are now possible to generate given a new set of spillover index measures, recently proposed by Diebold and Yilmaz (2012, 2016). These measures could be used to compute shocks to volatility (or returns) that spill across to sectoral stock returns in the UAE stock markets from the oil market. Therefore, it is now possible to assess the contribution of the oil market in the information transmission mechanism that characterizes a system of variables composed of oil and sectoral stock returns in the UAE markets; and this is the objective of the this paper.

Our results show that the influence is not uniform across the equity sectors. The oil return shocks significantly impact the Industries, Utilities and Financials sectors, while its effect is insignificant on the Services sectors. These results represent a unique information transmission mechanism that is useful for risk management and portfolio diversification.

SP21

**Changes in Human Research Capital at UAEU: A Bibliometric Examination of Faculty Turnover in 2015**

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The current study explores the use of bibliometric indicators of research performance in an anonymized sample of research faculty at UAEU. UAEU data from 2015 is compared against 2016 UAEU faculty profiles from the university website to assist in the identification of all new faculty (joined since Fall 2015) and recently departed faculty (left since June 2015). The current study utilizes research performance data for these samples from the publically available information in the SCOPUS database. The study then compares the research performance of incoming and outgoing faculty to assess the relative influence of faculty changes on the human research capital at UAEU. Findings indicate the 2015 changes have resulted in a loss of human research capital. With incoming faculty on average displaying lower research metrics than outgoing faculty. Such information is valuable in understanding relative changes to research capacity within the university and assisting in identifying patterns that may inform UAEU faculty management and research policy.

SP22

### **Electronic and Optical Properties of Aluminum nitride nano-clusters**

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Aluminum-Nitride (AlN) is a piezoelectric material that has the ability to maintain piezoelectricity up to 1200o C, AlN is also a promising material for use in surface acoustic wave (SAW) devices, sensor, thin film resonators, metal-oxide semiconductor (MOS) applications and microelectronic devices. In the past decade, various techniques were employed to produce Aluminum Nitride thin films and nanostructures such as, pulsed laser deposition (PLD).

In this work, we have undertaken a systematic and an accurate theoretical study of the electronic and optical properties of AlN nanoclusters. All the fundamental properties were studied as a function of temperature and pressure. Since any structural change influences on the electronic and optical properties, a correlation between the two effects is analyzed. The properties of AlN nanoclusters can be engineered to desirable values by altering the size of these clusters, therefore a study of the effect of the size of AlN nanoclusters will be investigated.

**SP23**

**Traffic Analysis of Biometric Data over a WLAN and Local Power Line  
Communication Network**

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Biometric data is being used daily by capturing people's fingerprints, Iris scans and other biometric features. The transmission of captured biometric data in most cases is done over a wired local area network (LAN) connections such as Ethernet. Investigation of how secure this transmission over a LAN has been investigated before. However, very few studies have been conducted on the security and quality of transmitting biometric data over a wireless LAN (WLAN) or local power line communication network (LPLCN). This is important as many implementation of biometric systems can be more conveniently deployed using such technologies when a wired LAN solution is not possible. In this work, we will conduct two sets of investigations. One is to analyze biometric traffic and security vulnerabilities when transmitting biometric data over a WLAN based network and the second is by studying the same for a LPLCN. These investigations will shed the light on possible attacks and their consequences when using such networks for transmitting biometric data.



SP24

## Experimental investigation of heat pipes and fins performance for engine cooling

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Heating pipes are considered one of the best method to move thermal energy from one point to another, it is mostly used for cooling and it work on a combination of conduction and convective heat transfer. It was first introduced in the early 60's for space applications as heat conduction in vacuum is very low thus it was important to find a new effective and fast way to transfer heat from inside to outside.

The basic idea of heating pipe is based on an evaporation and condensation process, at the heat source the cold fluid inside the pipe evaporate and then go to a heat sink where it condenses and then goes back to the heat source, due to the different material properties it is important to use the appropriate fluid for our application. It is also important to choose a fluid that will not react with the walls, for example: Acetone, Methanol and water for copper pipes.

This experiment simulates the heat coming off the combustion engine and it will consists of electric cooker containing varying degrees of heat flux that have to heat cylindrical part made of copper and insulated from outside to make the heat flow in one dimension only. After that there is specimen that have two parts: bottom plate and the fined part. On top of the bottom plate there will be fin or fin with groves to work as heat pipes. Temperatures of the material in the heat transfer direction shall be measured by two rows of thermocouples in the bottom plate part, so that heat flux may be measured. Temperatures in many locations of the specimen are measured by thermocouples. The fins sections are designed to fulfill the cooling requirement by a typical engine with standard shape of fins. The heat pipes are designed from fins with built-in groove to be filled in by liquid. The liquids are selected to suit the operating temperatures. Filling ratio of heat pipes is one independent parameter.

SP25

**Compressive Sensing for In-Door Source Localizations**

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Source localization is an important aspect for target tracking and locationaware services, and has many applications in the field of seismology, acoustics, radar, sonar, and oceanography. Indoor localization has recently received attentions in the areas of signal processing and sensor networks. Accurate indoor localization has the potential to transform the way people navigate indoors in a similar way that global positioning systems (GPS) transformed the way people navigate outdoors. Over the last decades, several human-centric approaches to indoor localization have been proposed by both academia and industry, but we have yet to see large scale deployments. Different methods are used for indoor localizations based on one of the following approaches: time of arrival (TOA), angle of arrival (AOA) and received signal strength indicator (RSSI). The RSSI is based on the power transmitted by the device to be localized. The map-based systems are characterized by the discretization of the environment with a grid. Each cell represents a possible position occupied by the device to be localized. The map-based RSSI constructs a database associating measured RSSI measurements to locations. The resulting location estimate is acquired from the record which closely matches the query RSSI. Compressive sensing (CS) is an emerging theory for representing and reconstructing sparse signals. When a signal has a sparse representation, the signal may be reconstructed from a small number of measurements from linear projections onto some basis. In this sense, the CS framework is used to find the location vector of the wireless sensor. Experiments were conducted in a room to show that the CS approach for source localization can achieve good location estimates using the map-based RSSI of WiFi base stations.

**KEYWORDS:** In-door source localizations, map-based RSSI, compressive sensing.

SP26

## All Optical Data Processing With Solitons in Wave-Guides

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Optical pulses have proven to be advantageous over electronic means when it comes to data transfer. One of these advantages includes a much higher speed of data transfer. This report aims at exploiting these advantages in data processing as well to create an all data processing device. The behavior of a soliton in the presence of a potential well studied in this report is described by the Gross-Pitaevskii (GP) equation:

$$i \frac{\partial}{\partial t} \Psi(x, t) = \left[ -\frac{1}{2} \frac{\partial^2}{\partial x^2} + V(x) + g |\Psi(x, t)|^2 \right] \Psi(x, t), \quad (1)$$

where  $V(x)$  is a potential well, the factor  $g$  denotes the mean-field interaction strength and is taken as  $g=1$  in the numerical calculations.

This equation describes the behavior of the soliton at all the devices in this report which includes a switch, diode, and logic gates.

**SP27**

**A Numerical Algorithm for Solving Third-Order Nonlinear Boundary Value Problems with Engineering Application**

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We develop a numerical algorithm for solving third order boundary value problems. This numerical algorithm is based on the spectral method with Legendre functions as basis. A well-known engineering problem related to fluid flow over a preamble shrinking infinite cylinder is solved numerically throughout this study.

SP28

### **Bilirbin Adsorption by Chitosan Coated Activated Carbon**

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The target of this process was to prepare activated carbon (AC) from powdered date pits and observe how its adsorption of bilirubin toxin changed when it is coated with chitosan gel as opposed to when it is not. Adsorption is very important when it comes to removing toxins from liver failure patients' blood stream. It has been recognized in preceding literature that AC has a relatively high capacity to adsorb albumin-bound toxins, which is why it is being utilized for this purpose. An increase in the adsorption of bilirubin requires an increase in the surface area of the AC. In order to attain this increase, pyrolysis process was implemented. Moreover, the AC capacity of absorbance was increased by coating it with chitosan gel, which contains several groups on its chains that act as interaction sites. Results indicated that the presence of AC lead to a dramatic cut in bilirubin and when the concentration of AC was increased, the rate of adsorption increased and a higher capacity of adsorption was obtained. The outcome also illustrated that chitosan coated AC has an adsorption percentage of about 70% higher when left to react for a longer interval of time.

SP29

### Conflict management in Arab mother-daughter pairs

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Intergenerational conflict refers to disagreements that commonly occur between parents and children. It is an important but under-researched topic in Arab families. In this study, we quantitatively examined the nature and extent of intergenerational conflict between 171 mother-daughter pairs in the United Arab Emirates. In particular, we identified the issues that parents and children fight about and explored how each of these issues is resolved. We built on recent research by creating an Arabic version of the *Arab Family Conflict Inventory* (Rasmi & Daly, 2016) and administering it to a community sample. Participants were recruited through snowball sampling starting with UAE University students. We also developed and administered a measure of conflict management. This measure was based on a previous measure of conflict management (Daly, Lee, Soutar, & Rasmi, 2010), but also included *deceit* - a conflict management strategy that was identified by Rasmi, Daly, and Chuang (2014). Participants completed an online survey that was offered in both English and Arabic. All measures were back-translated (Brislin, 1970). We found that mothers and daughters generally reported similar levels of intergenerational conflict. However, daughters reported more conflict around personal choice and dating/marriage issues than their mothers did. We found significant differences between conflict management strategies. Daughters were more likely to avoid, oblige, and integrate with their mothers, whereas mothers preferred to dominate, compromise, and integrate. These patterns of conflict management can be explained through Arab family norms and socially desirable responding.

SP30

## **Optimization of Nano-filler Contents in Woven Laminated Nano-composites for Best Performance**

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Multi-walled carbon nanotubes have been widely used as nanofillers for polymer reinforcement due to their excellent mechanical properties. This project is a continuation and buildup on the work completed in the summer of 2015. The study, in general, is concerned with the synthesis of Multi-Walled Carbon Nanotube (MWCNT) reinforced Kevlar composites by varying the weight % of MWCNT, using the wet lay-up technique. These produced nanocomposites samples are then examined for their various physical, chemical, thermal, and mechanical properties through several tests such as tensile test, three point bending test, and thermal conductivity test. The variation in their characteristics is explained based on the differences in their carbon nanofillers concentrations. In SURE 2015, laminated kevlar composite samples of seven various MWCNT concentrations (0%,0.2%,0.3%,0.4%,0.5%,0.6%,0.8%) were synthesized and tested. It has been concluded that 0.5 wt.% could be the optimum concentration. In this research, four more kevlar composite laminates were prepared with concentrations close to 0.5 wt.% (i.e., 0.45%, 0.5%, 0.55%) to confirm the previous conclusion. A composite with 0.9 wt.% MWCNT was also prepared to check whether a composite with higher nanofillers concentration can be prepared. In addition, two samples of Kevlar fibers/epoxy composites reinforced with Aluminum Oxide and Silicon Carbide nano-fillers were prepared to conduct a comparative study. This report also discusses MWCNT reinforced Kevlar/epoxy composite in general, highlighting its excellent properties obtained from the various experiments that were conducted, thereby making it a material of keen interest in the aircraft industry, pressure vessels as well as other industries. Further work is also currently in progress to evaluate the applicability of this composite to a broader range of applications.

SP31

**Development of Polymeric Composite Material based on Bauxite Residue****Maissa Adi, Fatima Al Ghaferi, Sara Alyahyaee, Maryam Aljabri, Basim Abu-Jdayil\****Chemical & Petroleum Engineering Department, United Arab Emirates University, Al Ain, UAE.*

There are several advantages, either environmental or economical, of using waste-based composites over ordinary composites. The availability of wastes at very low cost levels makes the production of these composites economically feasible. This study aims to provide a preliminary evaluation on the possibility of using the bauxite residue (BR) as a filler in thermoset matrices of an insulating/construction material to reduce the heat loss in buildings. BR is a primary waste in alumina refineries, where a big one will start its production in UAE by the end of 2017 with a capacity of 2,000,000 tpa of smelter grade alumina. Unsaturated polyester blended with the filler with a given polymer/filler ratio was transformed into solid upon thermo-set process. The composites were prepared using different BR concentrations (0 - 60 vol.%). The solid samples produced have been then subjected to different physical and mechanical tests to come up with a product formulation having optimum properties. The composites were characterized by testing the thermal conductivity, water retention, density, thermal stability, compressive strength, tensile strength and microstructure (SEM). The results revealed that the BR proved to be a good filler that can be used with unsaturated polyester to produce stable composite. The low value of thermal conductivity ( $0.08 \text{ W/m.K}$  at 10% BR –  $0.149 \text{ W/m.K}$  at 60% BR) and very low water retention (< 1.65%) of BR-polyester composite showed promise for constructive applications as a thermal insulator. In addition, the prepared composites showed clear increase in thermal stability when compared with neat polymer. On the hand, the BR-polyester composites demonstrated superior mechanical tensile strengths and compressive strength if compared with the currently used insulating materials and comparable to some construction materials.

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SP32

**Fabrication and characterization of size-selected Cu nanoclusters using a magnetron sputtering source**

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Nanoparticles are microscopic entities with a very wide variety of applications in various fields. The small size of nanoparticles make the surface/volume ratio larger, and so the nanoparticles will be more reactive with the environment. Moreover, variation in the size of Nano-clusters leads to changes in their properties. Copper is one of the elements attracted the attention of researchers due to its use in many applications.

In this work, different sizes of copper nano-clusters were prepared by using an ultra-high vacuum magnetron sputtering system and gas condensation. Varying the conditions of the preparation method such as the aggregation length (L) and the Argon (Ar) gas flow rate allows controlling the size of the produced copper nanoclusters.

SP33

**In-Door Source Localizations for Assistive Healthcare**

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The indoor localization is very important for healthcare applications by providing effective means in tracking the position, motion, and reactions of a patient, the elderly or any person with special needs for medical observation or accident prevention. In assistive health applications, the individual wear a small device emitting a radio frequency signal. The emitter propagates a signal that could be received and captured by several pre-mounted wireless sensors located in known positions. The location of the emitter is determined from processing the sensor information. In this paper indoor localization of wireless sensors network is addressed based on the received signal strength indicator (RSSI) method. The map-based RSSI method is used for localizations because it provides better accuracy. The map-based systems are characterized by the discretization of the environment with a grid. Each cell represents a possible position occupied by the device to be localized. Compressive sensing (CS) is an emerging theory for representing and reconstructing sparse signals by using far fewer measurements than the number of Nyquist samples. When a signal has a sparse representation, the signal may be reconstructed from a small number of measurements from linear projections onto some basis. In this sense, the CS framework is used to find the position vector. The dictionary matrix of the source localization problem is constructed using the measured RSSI from a WiFi base-station. The performance of different CS algorithms is investigated for source localization under different conditions.

**KEYWORDS:** In-door source localizations, map-based RSSI, compressive sensing.

SP34

## Performance Evaluation of Vegetative Biofiltration Based Aquaculture Wastewater Treatment System

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Nowadays, aquaculture is growing rapidly on a global scale. According to the FAO, aquaculture provides 47% of the global human fish consumption. Not surprisingly, the UAE has its substantial share of aqua farming industry. Aqua farms, however, can be associated with fresh water or marine water, can be closed or open and can be inland or on the coastline. The main focus of AWW treatment is to remove solid materials, ammonia and nitrite, maintenance of pH and balance in pathogenic bacterial growth, and addition of oxygen to water.

The production of aqua farms is directly related to the quality of water in the farms. This means that regular monitoring of aquacultures' water is the key to fish crop in aqua farms. If this waste is left untreated in the aquaculture water, it becomes detrimental to the fish living there and affecting the production negatively. However, the composition of AWW depends on a number of aspects in the aquaculture, such as the fish type and age, the kind of food supplied, the frequency of feeds, and the quality of aquaculture water.

The vegetative biofiltration system is an effective way of treating stormwater and domestic greywater. In case of AWW treatment, aquaculture water is made to flow through the vegetation in the bioretention system where water infiltrates into the soil getting filtered on its way. This water is collected in a subsurface reservoir or allowed to recharge the groundwater reservoir. The advantage of this vegetation accompanied system is that it is able to adequately take care of the organic matter through plant uptake. In the UAE, Chowdhury (2015) observed that the biofiltration system removes considerable turbidity, 87% of TDS, reduced up to 73% of salinity, sodium, potassium, calcium, 79-95% of nitrate ( $\text{NO}_3^- / \text{NO}_3\text{-N}$ ), 99-100% of ammonia nitrogen ( $\text{NH}_4\text{-N}$ ), 95-98% of COD, and 90% of the microbial count from domestic greywater.

The hypothesis of the study is "vegetative biofiltration system improves the quality of aquaculture wastewater for their recycling and reuse". The aim of this study is to recycle and reuse of aquaculture wastewater using a vegetative biofiltration system in order to reduce the consumption of water in the growing aquaculture industry in the UAE. Specific objectives of this research are to estimate changes in the AWW quality through a vegetative biofiltration system in the field, and to monitor the changes in biofiltration hydraulic conductivity due to AWW irrigation. The study was conducted from June to July 2016, as part of the UAEU SURE summer grant. There is no doubt that the soil in the biofiltration system is clogged and the outermost layer of the soil needs to be scrapped after a period of time. Also, there was a change in the quality of wastewater after it goes through the biofiltration system in terms of the pH, TDS, conductivity, and salinity. Moreover, it was observed that the plants located on the downstream side grew faster, which is because the downstream side is extensively exposed to AWW due to the inclination in the ground.

SP35

**New innovative hair test to determine glucocorticoid levels in racing camels' health and disease**

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**BACKGROUND:** This study was designed in collaboration with Camel Research Centre, Department of Presidential Affairs (DOPA) Al Ain, UAE, to investigate the effect of racing on the hair concentrations of glucocorticoids and stimulants in healthy racing camels in UAE.

Some research has been done to study the role of glucocorticoids in doping but camel saliva, blood or urine samples are usually used as matrix for determination of endogenous and synthetic glucocorticoids to evaluate corticosteroids levels in camels for injuries, disease and doping control. The aim of this project was to develop and validate a new hair test for analysis of corticosteroids and stimulants in camel hair and use the new test to analyse hair samples from a variety of camel breeds in sports and racing applications. These findings could be of importance when evaluating racing camels with suspected doping or related injuries and disease control after hard exercise.

**METHODS:** Camel hair samples were collected from 30 dromedary camels along with 3 racing camels in Al Ain, UAE and then they were being pulverized, decontaminated, sonicated and extracted prior to analyses. A liquid chromatographic mass spectrometric method was employed to determine different levels of glucocorticoids in camel hair samples.

**RESULTS:** The four drugs of interest mainly cortisol, dexamethasone, flumethasone and methylprednisolone along with an internal standard were quantified in camel hair samples. All the four glucocorticoids were found in camel hair samples.

**CONCLUSIONS:** It is the first time that we are reporting this innovative hair test for corticosteroids analysis in camel hair. The new test has been validated according to FDA guidelines in camel hair. This new hair test will be useful in the doping analysis, toxicological studies as well as in pharmaceutical analysis and other clinical applications in camel health and disease.

The new research has been submitted to Forensic Science International Journal for Publication.

**ACKNOWLEDGEMENT:** The authors really appreciate the grant awarded to them for, SURE summer project-2016.

SP36

### **Determinants of IPO Pricing and Long-Term Performance in the MENA Region**

**Chiraz Labidi**, Sayeed Ashharuddin, Amgad Khattab, Ibrahim S. Mhanna and Khaled A. J. Taha

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Despite a significant slowdown resulting from the 2008 financial crisis, IPO activity in the MENA region seems to be on the right track to recovery. Therefore, it is important to understand the factors that affect IPO stock pricing in this part of the world. This could have strong implications for setting up the timing and pricing of the offerings, as well as the aftermarket trading strategies. Using a hand-collected sample of IPOs from the MENA region over a period of more than 15 years, the purpose of this paper is to identify the factors that affect the underpricing and long-term underperformance documented in IPOs undertaken in the MENA region. More specifically, we aim at exploring the impact of investors' optimism and divergence of opinions on IPOs' underpricing and long-term underperformance. The research also offers informative conclusions relevant to one of the areas of policy focus of the Abu Dhabi Economic Vision 2030 aiming at "more efficient and less speculative financial markets".

SP37

### **Consumers Use of Social Media and Online Food Ordering Services in United Arab Emirates**

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Consumers in today's world are increasingly rely on the internet to obtain information about foods and compare between various purchasing alternatives, in order to maximize their knowledge before taking such important decision of food purchase. The objective of this research is to study United Arab Emirates consumers' behavior and attitudes toward using the World Wide Web (WWW) for ordering food online as well as their perception of the impact social media (e.g. Facebook, Twitter, Instagram, and WhatsApp) on increasing their knowledge about their food purchasing options. The methodology and analysis tools used in this research included conducting both questionnaire to carry out face to face survey as well as online survey; data tabulation in a step to conduct descriptive statistics; results frequency analysis; and correlation between the study's dependent and explanatory variables (e.g. between obtaining information on special diet or organic food on one side and the consumers' socio-economic characteristics on the other side). Results of this study showed that about 50% of the respondent are frequently using Talbat® website to order food online and they are highly satisfied about such website design and the information about food content and food quality provided in the website. Other Websites such as 24H®; Foodonclick®; YallaEat® were used by consumers less frequently compared to Talbat®. The survey's results analysis showed the presence of a correlation between amount of spending on food online and the number consumers/respondents on one hand and the numbers of consumers who are seeking information about food quality and safety, those who would like to obtain information about special diet, and those who are often inquiring about food's content and if buying organic food is an available option on the other hand. This study concludes that using online food ordering and the impact of using social media to gather valuable information about food safety and food quality is increasing in UAE and so the subject requires further research to help decision makers to support such information dissemination to larger number of consumers in United Arab Emirates.

**KEY WORDS:** Online Food Services, Food Quality and Safety, Social Media

SP38

### Tourist Maps' Symbology in the United Arab Emirates (UAE)

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United Arab Emirates (UAE) has become a popular tourist destination with millions of people visiting different parts of UAE each year. There are many ways to identify these tourists' attraction points whether by using tourism maps, tourism guidebook, tourism brochures, and more on internet portals and web sites "icons". In this research project, the researchers display and describe a series of cartographic symbols design for UAE's tourist maps that are produced by different organizations among the seven emirates. The methodology that was used on the research tested the usage of visual (graphic) variables among the UAE's tourist maps such as: size, shape, and color. The results of the test showed that there is lack of uniformity (lots of differences) in graphic variables of tourism symbols used on tourist maps around the UAE different seven emirates. Therefore, these differences may confuse the map users in searching symbols, understanding symbols, and interpreting symbols. A survey questionnaire distributed to visiting tourists and they have expressed the confusion in map symbols among the different emirates. In conclusion, this paper addressed the need for a standard for map symbology in the UAE.

**Keywords:** graphic variables, symbols, tourist map, UAE, visual search

**SP39**

**Some divisibility properties of binomial coefficients and q-binomial coefficients.**

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**Abstract**

A central problem in number theory is to find prime factorization and divisibility properties of positive integers and sequences of positive integers such as the sequence of binomial coefficients. Despite the importance of binomial coefficients and their wide range of applications in many branches of mathematics, only few is known about divisibility properties and prime factors. The classical approaches which have been used to study the properties of binomial coefficients include number theory combinatorics along with algebraic manipulations. In this project we shed light on the divisibility properties of binomial coefficients by means of the theory of q-series.



SP 40

### **Low cost gas sensor fabrication for petroleum industry applications**

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#### **Abstract**

In this project, two types of hydrogen sulfide (H<sub>2</sub>S) gas sensors were fabricated based on copper-oxide (CuO) and Palladium (Pd) nanoparticles embedded in organic polymer. The CuO and Pd nanoparticles are prepared using colloid microwave-thermal method and reduction method, respectively. Polymer solutions of poly-vinyl-alcohol (PVA) and glycerol ionic liquid (IL) were prepared and doped with the CuO and Pd NPs, and then a solution casting method was used to fabricate the sensing membrane. These sensing membrane are flexible and having semiconducting properties. The fabricated membranes (PVA+IL+CuO and PVA+IL+Pd) have been tested against H<sub>2</sub>S gas at different temperatures and H<sub>2</sub>S gas concentrations. The sensing elements are sandwiched between two electrical electrodes and exposed to H<sub>2</sub>S gas. A constant voltage is applied across the electrodes, and the electrical current response signal was measured. Both sensors (PVA+IL+CuO) and (PVA+IL+Pd) have detected the H<sub>2</sub>S gas at low concentrations (25 PPM) and 80°C working temperature. These inorganic-organic hybrid gas sensors are cost-effective and low power consumption. The results conclude that the sensitivity of CuO based sensor is better than Pd based sensor for H<sub>2</sub>S gas.

