UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Biology**

Species Identification And Whole Genome Sequencing Of Plant Growth Promoting Bacteria

Main presenter: **Malak Abdulla Yousif Mohammed Aldarmaki**

Supervisor: **Prof . Khalid M.A Amiri**

Co-presenters: **Aysha Maatouq Awad Alnuaimi Wadima Awad Saif Albalooshi Malak Abdulla Aldaramki**

Abstract: *Bacteria are found everywhere; they have both positive and negative roles in our life. There are plenty of unknown bacterial species are found in soil, which helps/supports plant growth. Species identification, characterization and whole genome sequencing of these plant growth promoting bacteria (PGPB) help us to improve understanding of the plant microbial interaction process . This study, we isolated three PGPB from plant rhizosphere (named as N14 , F2R5 and 838). Based on bacterial 16s rRNA marker gene (sanger sequencing method), we identified all the isolated bacteria belonging to Streptomyces genus. Based on the NCBI-Blast homology match, we identified the samples F2R5 and 838 as Streptomyces afghaniensis and sample N14 as Streptomyces graminearu. The whole genomes of the three samples were carried out using both Illumina , and Nanopore based sequencing technology. Whole genome analysis resulted fragmented genome assembly (genome size ~8 Mb) and ~7100 to 8200 gene models from the assembly. We didn't carry out any functional analysis of predicted genes at this point. In the future, we will be doing the functional gene annotation process. We believe the annotated genes could pave the path to identify/construct metabolic pathways and improve our understanding about the plant bacteria interaction process.*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Biology**

Understanding The Process Of Assigning Species To The (Iucn) Red List

Main presenter: **Dalal Belal Kamel Mohamed Aldhanhani**

Supervisor: **Dr. Sofyan Aalyan**

Co-presenters:

Abstract: *The International Union for Conservation of Nature (IUCN) Red List of endangered species was founded in 1964. (IUCN) Is the world's most comprehensive inventory of the global conservation status of biological species. The IUCN Red List is recognized as the most authoritative and official guide to the status of biological diversity. This is because it uses a set of precise criteria and methods to evaluate the extinction risk of thousands of species and subspecies. One of the most important goals of (IUCN) is to provide scientifically based information on the status of species and subspecies at a global level, to draw attention to the magnitude and importance of threatened biodiversity, influence national, international policy and decision-making. This research aims to understand the process of assigning species by the IUCN Red List. I will also be looking at the process of assigning status to some of the endangered animals or plants in UAE.*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Chemsitry**

Azo-8-Hydroxiquinolione (Azo-8Hq) Derivatives: Synthesis, Characterization, Metal Chelating Properties, And Spectroscopic Study, For The Treatment Of The Alzheimer'S Diseases.

Main presenter: **Dhabya Bakhit Al Balushi**

Supervisor: **Dr. Abdelouahid Samadi**

Co-presenters: **Aysha Mohammed Alshamsi Rawdhah Alzahmi**

Abstract: *Alzheimer's disease is an irreversible, progressive brain disorder that slowly destroys memory and thinking skills, and, eventually, the ability to carry out the simplest tasks. Excessive metal accumulation in the brain is the leading cause of the Alzheimer and other neurodegenerative disease. Several studies have shown a strong correlation between metal imbalances and several neurological diseases, including Alzheimer's and Parkinson's diseases. 8-Hydroxyquinoline (8-HQ) is a small molecule with potential effect as metal chelating that may restore metal balance and be useful for the treatment. In this project we synthesized new molecules containing 8-HQ and Azo group (-N=N-) such as (E)-5-(ethoxymethyl)-7-(phenyldiazenyl)quinolin-8-ol (4a) and (E)-5-(ethoxymethyl)-7-((2-nitrophenyl)diazenyl)quinolin-8-ol (4b) by coupling reaction of 5-(ethoxymethyl)quinolin-8-ol with diazotized aniline derivatives at 0^{o}C. The structure of 4a and 4b was fully characterized by spectroscopic techniques (1H, 13C, gCOSY, gHSQC, and gHMBC-NMR, and IR). The absorption spectra of compounds 4a and 4b were recorded in various solvents in the range between 200 to 800 nm to understand the effect of solvent polarity on absorption in the UV–vis region. The study of the chelating effects by metals such as Copper, Aluminum, Zinc, and Iron, was carried out using different technics such as NMR, UV-vis, and fluorescence spectroscopy.*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Physics**

Single-Step Synthesis And Growth Of Nanoflower-Like Structure Of Zno For High-Performance Supercapacitor

Main presenter: **Aiche El Massoumi**

Supervisor: **Dr. Ihab Obaidat**

Co-presenters: **Noof Salem Ruaa Motasim Ahmed Maram Rashad**

Abstract: *Over the past few decades, the application of various materials in energy storage system has led to excellent developments. Due to their interesting physical and chemical properties, metal oxide materials have been a focus of research for applications in energy storage devices. Used as a supercapacitor electrode material, metal oxides are known to have promising performance for fabricating various supercapacitor devices in a broad voltage window. In this work, we have synthesized Zinc Oxide (ZnO) semi-conducting material on Ni foam, using the hydrothermal synthesis technique. Morphology and structure of the synthesized ZnO sample have been investigated by scanning electron microscopy (SEM) and x-ray diffraction (XRD). The SEM study revealed nano flower-like structures. Such structure is very promising for supercapacitor applications. The XRD results also successfully reveal the corresponding hexagonal ZnO peaks as per the reported literature data. These results disclose that the as-fabricated ZnO electrode could be a favorable electrode material and it holds good potential for efficient supercapacitor and energy storage-related applications. We will be performing the electro-chemical characterization on our electrode material soon. We are hopeful that, the as-prepared nanoflower-like structure of ZnO based electrode will display excellent results as a battery-type material.*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Chemistry**

Analysis Of The Solid Contents Of Toothpastes Available In Uae Markets

Main presenter: **Marim Elkashlan**

Supervisor: **Dr. Thies Thiemann**

Co-presenters:

Abstract: *The aim of this study is to analyze the solid contents extracted from 34 toothpastes. 31 of them were purchased from UAE markets, while 3 of them were imported from outside the UAE. For the chemical analysis the following techniques were used: Fourier Transform Infrared spectroscopy (FT-IR); Dry Ashing; X-ray fluorescence (XRF); and Energy Dispersive X-ray spectroscopy (EDS). Physical properties were used to separate potential polymer particles from other contents by floating experiments, and particles were analyzed under a stereoscope using Image J software. The major components in the toothpastes were either silica (SiO2) or calcium carbonate (CaCO3). Reaction of solid content of the toothpastes with aq. 0.1 N HCl and back titration with 0.1 N aq. NaOH were used for the quantification of CaCO3. Most of the beads were coated with pigments, and that was observed in 21 toothpastes. These pigments were analyzed and identified. Out of the analyzed toothpastes, none of them contained microplastics except for one imported toothpaste that had polyethene. The solid beads in the toothpastes were composed of silica and/or microcrystalline cellulose. The results show that analyzed toothpastes in the UAE do not contribute to microplastic pollution in the environment, in comparison to other cleansing products available in the market.*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Chemistry**

Analysis Of Commercial Prebiotic Supplements And Their Effect On Microbial Growth

Main presenter: **Marim Elkashlan**

Supervisor: **Dr. Nayla Munawar**

Co-presenters: **Alanoud Salem Aldhaheri Khansa Ahsan**

Abstract: *Prebiotics (non-digestible dietary fibers) confer health benefits when selectively fermented by beneficial gut microorganisms of the host. The use of prebiotics is an emerging therapeutic to manipulate several diseases including psychiatric disorders. Therefore, dietitians and health practitioners highly recommend the use of fiber for health maintenance. This study aims to analyze the chemical composition of commercially available prebiotics and to determine their effect on the growth of probiotics (beneficial gut microbiota) to evaluate their effectiveness in health care. Thus, ten prebiotics samples were collected from different pharmaceutical companies for this study. The literature has reported that non-digestible, water-soluble and insoluble fibers have different impact on microbial growth, therefore, the water solubility of all samples was analyzed. Two samples out of 10 were found to be completely water soluble while the other eight had different percentage of water soluble and insoluble portions. The thin layer chromatography (TLC) analysis of all samples has revealed the presence of saccharides with variable degree of polymerization (DP). The investigation of the effect of all prebiotic's samples on the growth of four probiotic strains by measuring the microbial growth at OD600 and through Miles and Misra method is under progress. The descriptive results will be presented*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Physics**

Controlled Nanoleaf-Like Structure Of Sro As A High-Performance Electrode For Supercapacitors

Main presenter: **Haya Ayyash**

Supervisor: **Prof.Ihab Obaidat**

Co-presenters: **Raghad Khaled Farajallah Reem Fararah Shaimaa Al Obaidy**

Abstract: *The employment of diverse materials in energy storage systems has resulted in excellent improvements during the last few decades. Due to their particular physical and chemical properties, for many applications in energy storage devices, metal oxide materials have been a focus of research. Used as a supercapacitor electrode material, metal oxides are known to have promising performance for fabricating various supercapacitor devices in a broad voltage window. In this research work, we have synthesized Strontium Oxide (SrO) semi-conducting material on top of Ni foam, using the hydrothermal synthesis technique. The morphology and structural analysis of the synthesized SrO structure was completed by using scanning electron microscopy (SEM) and x-ray diffraction (XRD). The SEM results reveal nano leaf-like structures. The XRD results also successfully reveal the corresponding cubic peaks of SrO as per the reported literature data. We will be performing the electro-chemical characterization on our electrode material soon. Finally, these findings show that the as-fabricated SrO electrode could be a promising electrode material for efficient supercapacitors and their energy storage-related applications. We are optimistic that our SrO structure-based electrode, as developed, can be employed successfully as a battery-type material.*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Biology**

Effect Of Carnosol On Insulin Receptor Studied By BRET Technology

Main presenter: **Anwaar Mohammed Alhadhrami**

Supervisor: **Dr. Mohammed Ayoub**

Co-presenters: **Maitha Ali Khamis Almeqbaali Latifa Noor Shambey**

Abstract: *The body breaks down the eaten food into glucose to use it as energy source. Diabetes is a disease that occurs when the body cannot use glucose in the correct way which lead to increase in the blood sugar level. Two common types of diabetes exist, type1 and type 2 diabetes. Carnosol which is a compound found in rosemary herb found to have anti diabetic effect. In this project we will test if carnosol activates the insulin receptor (IR) which will in turn activates Insulin Receptor Substrate 1 (IRS1). Bioluminescence resonance energy transfer (BRET) technology will be used, it increases the signal in the case of activation of the receptor. The (IR- Rluc) will be the donor and the (IRS1-YFP) will be the acceptor. We performed cells culturing, cells transfection, cells starvation, cells treatments and finally analyzing and calculating BRET measurements. We found out that carnosol increased the BRET signal when it was added alone to the cells, the signal was increased more with the addition of both carnosol and insulin. Moreover, carnosol and insulin has positive dose dependent effect. This describes that carnosol can bind to insulin receptor and activate it either in the active site of insulin or in another active site. We propose that this mechanism may have large interest and reach to high utility to diabetics.*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Mathematical Sciences**

Modeling The Spread Of The Covid-1 In The Neighborhoods Of Urban Cities

Main presenter: **Mohammad Greish**

Supervisor: **Dr. Abdessamad Tridane**

Co-presenters: **Yahya Yusuf Nahom Tesfasellassie Yaman Sabsabi**

Abstract: *When COVID hit the world, many cities had high fatalities despite their sustainable status, and people's lifestyles have shifted tremendously. As a result, the main questions are: is it possible to redesign cities to make them more health-sustainable, and how could sustainability as a concept be improved to provide the population with a healthier and safer lifestyle? Our main objective in this research is to create an agent-based model of city neighborhoods to investigate the best the factors that contribute the disease spread and find the optimal redesign strategy to plan a city in order to prevent a pandemic like COVID-19 from spreading. The three main factor that we consider are the density distribution in each the settlements, the age distribution, and the mobility distribution between the settlements. Our results show the impact of these factor on the disease prevalence, and it impact on different ages group of the populations. Using the genetic algorithm, we aim to find optimal distribution of these factors by settlement that help to contain the disease spread, which give the public health policy makers more reasonable way to stop the spread pandemic.*

UAEU كلية العلوم College of Science

جامعة الإمارات العربية المتحدة United Arab Emirates University

Department: **Chemistry**

Use Of Microbial Peroxidases For Water Remediation

Main presenter: **Maryam K. Poolad**

Supervisor: **Dr. Iltaf Shah**

Co-presenters: **Amna Mohamed Alaleeli Zeyadah Rashed Almesmari**

Abstract: *Emerging Pollutants (EPs) encompass a group of recently identified industrial and pharmaceutical anthropogenic contaminants that evade wastewater treatment and consequently persist in aquatic environments. The presence of EPs such as drugs, antibiotics, and steroids in waterbodies is associated with adverse ecotoxological impacts, which stresses the urgent need for developing advanced bioremediation methods targeting EPs in wastewater. Dye-decolorizing peroxidases (DyPs) are a class of oxidizing enzymes capable of degrading a wide range of pollutants into less toxic derivatives. This study evaluates the use of thermostable recombinant rDyPs in wastewater remediation by assessing their ability to degrade pollutants of concern. Particularly, the study employs an ultra-sensitive detection method using Liquid Chromatography-Tandem Mass Spectroscopy (LCMSMS) to detect the pollutants, in addition to spectrophotometric investigation of the DyPs activity under varying pH and temperature conditions. We were able to degrade pollutant dyes using the DyPs and simultaneously detect 4 of the EPs using a previously established LCMSMS method. Results of activity assays using ABTS substrate at different pH and temperature conditions offer important data on optimizing the activities of the enzymes. The findings support the use of recombinant DyPs as biocatalysts that can potentially be employed in wastewater bioremediation.*