

\*\*\*Academic staff who are not on this list will not be offering projects in Summer Semester 2020/2021

No	Supervisors		Project title	Project description	Discipline of research area	Note (optional)
	Main supervisor	Co-supervisor(s)				
1	Associate Professor Adeline Ting		Effect of metals on oil palm pathogen	This preliminary study will investigate the influence of common metals on the growth of the major pathogen of oil palm, Ganoderma. This study will be important to describe the impact of metal laden soils on growth and spread of the pathogen in oil palm plantations.	Biology (BIO), Biotechnology (BTH)	
2	Dr Adzzie Shazleen	Dr. Patrick Tan (SoS), Dr. Khoo Jing Jing (UM)	Development of DNA extraction method from fleas for the detection of zoonotic diseases	Fleas in the genus <i>Ctenocephalides</i> are agents of a variety of important zoonotic pathogens such as <i>Bartonella</i> and <i>Rickettsia</i> species. These vector-borne diseases are globally distributed and yet often overlooked. Previously, most of the study did the DNA extraction from the flea pools sample in order to detect the bacteria carried by them. This extraction approach did not allow for determining the prevalence of the zoonotic pathogens thus, there is very little information on the actual prevalence. The aim of this study is to develop and test an appropriate DNA extraction method from a single flea. In future, we can determine the actual prevalence of zoonotic pathogens.	Biology (BIO), Biotechnology (BTH), Medical Bioscience (MBS),	This project will lead to Honours project.
3	Dr Holly Barclay		Estimated carbon storage in urban trees in Bandar Sunway and Subang Jaya	This project aligns with a larger project exploring the distribution of trees in urban green spaces around Monash University Malaysia campus. The project will involve measuring and identifying (with support from local experts) a sample of the trees planted in parks and streets around Sunway and Subang Jaya, then calculating the amount of carbon which is currently stored by these trees. You will receive training in how to conduct vegetation surveys, how to estimate carbon storage in trees and you will generate useful data management recommendations about how to enhance carbon storage in trees planted around Sunway City.	Biology (BIO)	

4	Dr Irene Ling	Dr Lim Siew Huah (UM)	Synthesis of functional ionic liquids	The unfortunate negative side effects from the environmental unfriendly chemicals have impacted the globe. Efforts are underway to develop cleaner and efficient solvents including substituting solventless reaction medium in chemical processes (crucial in refineries and petrochemicals industries). This project is intended to introduce a series of functional ionic liquids through modification of commercial ones via simple and safe chemical process. The work involves organic synthesis and basic material characterization analyses.	Medicinal chemistry CHM, Food Science and Technology (FST), Biotechnology (BTH)	This project will lead to Honours project.
5	Dr Irene Ling	Dr Lim Siew Huah (UM)	Molecular sensors for anionic species	There is a growing interest in designing molecular sensors for anionic species driven by the substantial role of anions in biology and industrial processes and the need to develop new materials for sensing anionic environmental pollutants. The objective of this project is to synthesize a series of variable anion counterions with di-substituted N-heterocyclic cations and to examine the physical and chemical properties of these compounds after ion exchange. Further to this work, the compounds will be tested for sensing capability.	Medicinal chemistry CHM, Food Science and Technology (FST), Biotechnology (BTH)	This project will lead to Honours project.
6	Dr Ken Yeong Keng Yoon		Synthesis and investigation of novel small organic compounds in inhibiting cholinesterase enzymes.	Alzheimer's disease is a neurodegenerative disorder characterized by the progressive loss of memory and cognitive function. Anticholinergic compounds have the potential to be used to treat Alzheimer's disease (AD). The main aim of this exciting project is to synthesize and evaluate novel small organic compounds for their cholinesterase inhibitory potential. This project will provide the student an opportunity to potentially identify novel small molecule cholinesterase inhibitors via bioassays.	Medicinal Chemistry (CHM), Medical Biosciences (MBS)	
7	Dr Ken Yeong Keng Yoon		Chalcones as potential neuroprotective agents	Chalcone is the central core of many important biological compounds. It is the precursor to flavonoids biosynthesis in plants as well as the scaffold of many pharmacologically active compounds. In this project, students will have the opportunity to learn simple synthetic techniques as well as performing some relevant bioassays. This project will provide the student an opportunity to potentially identify novel chalcones as potential neuroprotective agents.	Medicinal Chemistry (CHM), Medical Biosciences (MBS)	
8	Dr Lee Yee Ying		Product formulation for palm-based lipstick	Lipstick is a decorative cosmetic that received tremendous attention in the cosmetic industry. In this project, product formulation study will be carried out for to investigate the incorporation of palm based oil in influencing the physiochemical properties of the lipstick. The lipstick will be tested in term of their melting point, colour intensity, and textural characteristics.	Food Science and Technology (FST)	

9	Dr Lee Yee Ying		Characterisation of olein and stearin fractions of crude palm oil	Crude palm oil is rich in carotenoids and vitamin E which are good anti-oxidants. In this project, dry fractionation of crude palm oil will be carried out on crude palm oil to separate it into olein and stearin fraction, respectively. The olein and stearin fraction will then be analyzed for their carotene and vitamin E content.	Food Science and Technology (FST)	
10	Dr Lee Yee Ying	Dr Michelle Yap (SOS), Professor Chan Eng Seng (SOE)	Deep frying performance of neutralised bleached deodorised palm olein	Deep frying process is a commonly used method across the world in food preparation. A deep fried food is always perceived to taste better by the consumers as it provides food with desirable colour, flavour and crispy texture. Palm fraction – palm olein is widely being utilized as deep fat frying medium because of the high oxidative stability that it possesses. Majority of the palm olein used for frying are derived from the physical refining process which is known as refined bleached deodorized palm olein. The present study will investigate a deep frying performance of the a chemically refined palm olein known as neutralised bleached deodorized palm olein.	Food Science and Technology (FST)	
11	Associate Professor Lim Yau Yan		Antioxidant properties of Brazilian spinach	Brazilian spinach is a recently imported green leaf vegetable plant from Brazil. It has not been extensively studied and to date no scientific investigation on its bioactivities has been reported although this vegetable is widely eaten in Brazil. The project involves extraction of antioxidants using various solvents and testing of antioxidant content and properties of the extracts.	Food Science and Technology (FST); Medicinal Chemistry (CHM), Biotechnology (BTH)	This project can continue into the Honours year.
12	Associate Professor Lim Yau Yan		Processing of herbal plants	This project involves using different drying methods (such as oven-drying at different temperatures, microwave drying at different powers, air-drying at ambient temperatures etc) to process tropical herbal plants with the purpose of preserving or enhancing the plant's bioactivity. Other than antioxidant and/or antibacterial screening tests, HPLC analysis may be performed to understand the changes in the bioactivity parameters.. The plants of choice will be chosen from the Lamiaceae family plants.	Food Science and Technology (FST); Medicinal Chemistry (CHM), Biotechnology (BTH)	
13	Associate Professor Lim Yau Yan		Effects of lighting conditions on nutritional properties of herbal plants	Photobiological research has become an area of increasing interest since the introduction of light-emitting diodes which have the potential to cover intensity and specific wavelength requirements of different phases of plants growth and thus affecting the biomass and metabolic products of cultivated plants. In the past decade, most research work has been done on culinary and medicinal herbs under controlled monochromatic red or blue light condition and few studies on the different ratios of combined red and blue have been reported. The main aim of this project is to investigate effects of different proportions of red, blue, green and far-red light on the tropical herbal plants. Changes in antioxidant, chlorophyll, carbohydrate contents as well as bioactivity will be determined.	Food Science and Technology (FST); Medicinal Chemistry (CHM), Biotechnology (BTH)	

14	Dr Md Zobaer Hasan		A statistical approach to identify the key risk factors of child malnutrition in Selangor State	This study attempts to identify the key risk factors of child malnutrition in the Selangor State by using a statistical approach	Medical Bioscience (MBS)	
15	Dr Md Zobaer Hasan		Effect of population density on the spread of COVID-19 in Malaysia	This study will use the qualitative analysis to investigate whether there is an association between the two categorical variables, effected groups of Covid-19 and population density groups in Malaysia. It will also use the quantitative analysis to examine whether there is any significant difference in the mean effected number of Covid-19 cases across population density in Malaysia.	Medical Bioscience (MBS)	
16	Dr Md Zobaer Hasan		Influence of age and gender on the mortality rate of COVID-19 in Malaysia.	This study will use the qualitative analysis to investigate whether there is an association between the demographic variables (age and gender) and the mortality rate of COVID-19 in Malaysia.	Medical Bioscience (MBS)	
17	Dr Md Zobaer Hasan		Investigate the state factor on the spread of COVID-19 in Malaysia.	In this research, we will apply the quantitative technique to investigate the state factor on the spread of COVID-19 in Malaysia.	Medical Bioscience (MBS)	
18	Dr Md Zobaer Hasan		Study the impact of COVID-19 on child physical and mental health in Selangor state of Malaysia.	Since the COVID-19 pandemic across the world, many actions have been executed to control the disease. And, such actions may have serious impact on child physical as well as mental health in many countries such as countries in Southeast Asia. The project aims to carry out a critical analysis on the child physical and mental health in the Selangor state of Malaysia in response to the COVID-19 effects.	Medical Bioscience (MBS)	
19	Dr Md Zobaer Hasan		Relation between lockdown and COVID-19 infections in Malaysia.	Malaysia reported its first COVID-19 positive case on January 25, 2020. As of October 5, the Southeast Asian country has recorded a total of 12813 cases, with 137 deaths. This study will try to investigate the significant relation of lockdown with the COVID-19 infections in Malaysia.	Medical Bioscience (MBS)	

20	Dr Michelle Yap Khai Khun	Dr Lee Yee Ying, Dr Max Lai	Effects of lipid peroxidation on neurodegenerative diseases: from the perspective of food matrices and biomedical sciences	Deep fat frying is one of the food preparation technique which changes the flavor and oil stability by oxidation, hydrolysis and polymerization. During deep frying, the triacylglycerol can be thermally oxidized into lipid peroxides which pose the potential health impacts. In this study, we would like to investigate the deep-fried oil in the progression of neurodegenerative disease in an in vitro model. The toxicity of lipid peroxides is evaluated by cell viability assay. Subsequently, the oxidative stress will be measured for the levels of reactive oxygen species. Advanced glycation end products (AGEs) are determined to examine the progression of neurodegeneration.	Food Science and Technology (FST), Medical Bioscience (MBS)	Can be expanded to Honours project
21	Dr Michelle Yap Khai Khun		Unveiling the toxin arsenals of Ringhals cobra venom for determination of cytotoxic proteins	The whole venom profiling of Ringhals cobra venom has revealed the presence of high abundance of three-finger toxins without dermonecrotic effects. This finding is in sharp contrast to those closely related spitting cobra species. This study aims to determine the presence of cytotoxic proteins, which may produce myotoxic effects more than demonecrosis.	Medical Bioscience (MBS)	Can be expanded to Honours project
22	Dr Michelle Yap Khai Khun		Neutralising potency of antibodies against epitope sites of cytotoxin.	Cytotoxin is a major toxin component of cobra venoms and it is responsible for dermonecrosis in affected patients. The current immunotherapy is ineffective against dermonecrosis due to low immunogenicity of the toxin. Our preliminary findings revealed the epitope sequences of cytotoxin are presumably located at its functional site. In this study, we would like to examine if a broad neutralising monoclonal antibody, a courtesy of AP Andres (DTU) is capable to neutralise the epitope sequences of the toxin instead of the whole cytotoxin.	Medical Bioscience (MBS)	
23	Dr Patrick Tan Hock Siew		Development of a novel DNA amplification method to detect antimicrobial resistance gene.	Antimicrobial resistance (AMR) in pathogenic bacteria is a global problem. It is expected to cause 10 million deaths annually by 2050 without proper intervention. Many bacteria acquired resistance against our last-line antibiotics due to the spread of AMR genes among bacteria.  The aim of this project is to explore a new method to detect AMR genes in bacteria. The student will employ various molecular biology and microbiology techniques in this project.	Biology (BIO), Biotechnology (BTH), Medical Bioscience (MBS),	

24	Dr Patrick Tan Hock Siew		A high-throughput functional metagenomics approach to profile antimicrobial resistance genes from environmental samples.	<p>Antibiotics saved millions of lives since their discovery more than 50 years ago. These drugs are commonly prescribed to combat bacterial infection. However, in the recent decade, there has been a rapid rise in antimicrobial-resistant bacteria. Horizontal gene transfer of the resistance gene between bacteria is one of the most common methods for bacteria to acquire resistance. Hence, it is crucial to understand the prevalence of these resistance genes from the environment.</p> <p>The aim of this study is to survey the presence of antimicrobial resistance genes in the environment. This project will utilise functional metagenomics approach, a powerful high-throughput to identify resistance genes from environmental samples. Students will employ various molecular biology, microbiology and bioinformatics techniques in this project.</p>	Biology (BIO), Biotechnology (BTH), Medical Bioscience (MBS),	
25	Dr Patrick Tan Hock Siew	Dr Foo Su Chern	Identification of bioplastic synthesis genes from a cyanobacteria.	<p>Polyhydroxyalkanoates are natural polyesters biosynthesized by a variety of bacteria under unbalanced growth conditions. Bacterially produced biodegradable PHAs with versatile properties can be achieved using different PHA synthases (PhaCs). However, sequence-based identification of these genes are often difficult.</p> <p>The aim of this study is to identify PhaCs in cyanobacteria via a functional metagenomics. This method is a sequence-independent approach that can screen for functional PhaCs in genome of a cyanobacteria. Students will employ various molecular biology, microbiology and bioinformatics techniques in this project.</p>	Biology (BIO), Biotechnology (BTH)	
26	Associate Professor Qasim Ayub		Whole genome sequencing and assembly of bacterial genomes using Oxford Nanopore technology.	<p>Oxford Nanopore sequencing technology generates long reads that make <i>de novo</i> assembly of genomes without the need for a reference genome. We aim to use this, with or without Illumina short-reads, to generate high quality reference genomes for interesting bacterial isolates. The project aims to develop students skills in genomic data generation and bioinformatic analysis.</p>	Biotechnology (BTH), Medical Bioscience (MBS)	Can lead to an Honours project
27	Associate Professor Qasim Ayub		Developing techniques for isolating high molecular weight genomic DNA for Oxford Nanopore or PacBio sequencing/.	<p>Oxford Nanopore and PacBio techniques are massively parallel, high throughput sequencing methods that generate long reads that make <i>de novo</i> assembly of genomes easy. However, in order to obtain good quality data the input DNA needs to be non-fragmented (&gt;70 kb) and of very high quality. This project aims to develop techniques for extraction of such DNA from a variety of fungal samples and, if time permits, to use it to generate high quality reference genome.</p>	Biotechnology (BTH)	Can lead to an Honours project

28	Professor Sadequr Rahman	Dr Joash Tan	Characterisation of pathogenic bacterial samples from Segamat hospital and comparison with community samples	We have characterised various bacterial strains found in fecal samples in the healthy community in Segamat. We have also collected over 200 pathogenic samples from Segamat General hospital. This project will compare selected samples of the same species from these two sources by various microbiological and molecular means, including sequencing.	Biology (BIO), Biotechnology (BTH), Medical Bioscience (MBS),	
29	Professor Sadequr Rahman	Associate Professor Qasim Ayub	Molecular phylogeny of fungi from fruit.	This project involves generating and analysing Intervening sequences from fungi found in fruit to generate a molecular description of their relatedness using bioinformatic tools.	Biology (BIO), Biotechnology (BTH)	
30	Associate Professor Siow Lee Fong		Comparison of pre-treatment and drying techniques on the nutritional and antioxidant properties of fruits and vegetables	Convection oven drying is commonly used in food dehydration. Food dehydrator is increasingly popular due to the faster drying rate and drying temperature. The current study aims to compare these two drying techniques and determine the nutritional and antioxidant properties of selected fruits or vegetables.	Food Science and Technology (FST)	
31	Associate Professor Siow Lee Fong		Comparison of pre-treatment and frozen storage on the nutritional and antioxidant properties of fruits and vegetables	Freezing storage is a preservation technique that can prolong the shelf life of fresh produce. In this study, effect of pretreatments followed by frozen storage on the nutritional and antioxidant properties of selected fruits and vegetables will be determined.	Food Science and Technology (FST)	
32	Professor Sunil K. Lal		Molecular studies on COVID-19 disease	The current pandemic has caused widespread destruction of life and economies worldwide. The causative microorganism is the SARS-CoV-2 virus about which very little is known. Scientists around the world are trying to quickly understand the molecular aspects of reasons on what makes this virus so dangerous and how it causes severe disease in humans. Innate immune response of the infected human is the primary mechanism that dictates whether a patient will stay alive or die due to COVID-19 pulmonary distress or related syndromes. Our lab has initiated a fast paced research project on molecular studies on the biochemical pathways that are modulated by SARS-CoV-2 viral genes to understand hidden secrets about this virus. Interested students must possess a strong desire and liking for molecular and biochemical lab techniques and a great interest in Virology.	Biology (BIO), Biotechnology (BTH), Medical Bioscience (MBS)	Possibility for continuation into Honours project

33	Dr Tan Ji Wei		Effects of Malaysia stingless bee honey on mediators' release by mast cell in allergy	<p>Over the decades, allergic diseases have affected up to 30% of the world population and are currently a major global health problem. Their pathogenesis is constantly linked to the role of mast cells. Although several treatment modalities have been undertaken to tackle the development of allergy, these treatments have limited clinical success and some even lead to serious side effects. Honey is a thick, golden liquid produced by bees that has been used widely for its therapeutic effects. It has been proven to possess various pharmacological properties such as anti-inflammatory and anti-ageing activities. However, the effects of honey in allergy have yet to be elucidated. Thus, this project was designed to study whether a Malaysia stingless bee honey has an effect against selected key mediators' release in mast cell degranulation. The current research project is sufficient to allow 2 students to tag along.</p>	Biology (BIO), Biotechnology (BTH), Medical Bioscience (MBS)	
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