UNION UNIVERSITY

Fall Poster Session

November 17, 2020

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Fall Poster Session

TUESDAY, NOVEMBER 17, 2020

SUB Hallway | 11 a.m. –12:30 p.m.

Student Presenters

Art

Emily Chapman | "Beatrix Potter: The Golden Age Illustrator Who Changed Children's Literature"

Ruth Duncan | "The Mingei Philosophy and its Effect on Contemporary Ceramic Craft"

Anna Claire Winchester | "Methods in Which Art Therapy Can Engage Children with Autism Spectrum Disorder"

Biology

Cooper Bullough | "Investigating the Effects of *Pseudomonas fluorescens* on the Intestinal Barrier in Zebrafish"

Jordan Crawford | "Creating DNA Constructs to Make a Transgenic Zebrafish Line"

Cordelia Moss Hoverson | "Effects of Vitamin D on Deiodinase 3 Levels in Adult Zebrafish *(Danio rerio)*"

Samuel Ross | "*Meleagris gallopava* Assessment at the Milan Army Ammunition Plant"

Pharmacy

Sean Halsey and Luna L. Bennett | "*Clausena anisata* Leaf Induced Cell Death in Human Mesothelioma Lung Cancer MSTO Cell Lines via Inhibition MEK 1, 2, and 4, MTOR, and Cyclin B1"

Josiah Hays and Luna L. Bennett | "*Piper guineense* Leaf Induced Cell Death in Human Mesothelioma MSTO-211H Cell Lines via Inhibition of MEK and Cell Cycle"

ART

Beatrix Potter: The Golden Age Illustrator Who Changed Children's Literature

Presenter: Emily Chapman
Faculty Advisor: Haelim Allen

The Golden Age of children's illustration in Great Britain featured one of the most esteemed children's book authors and illustrators of all time, Beatrix Potter. Potter introduced the culture of children's book illustration, changing the perception of how children ought to be communicated with and entertained. Her folklore-inspired watercolors of woodland creatures, influenced by her fascination of botany and animal anatomy, inspired an increasing appreciation for nature. Her stories were often inspired by Potter's keen observation of the organic world, in which she incorporated her scientific understanding of plants and creatures. Gifted with the mindset of seeing the countryside through an imaginative lens, Potter wove her wildly popular tales of Peter Rabbit and other rambunctious farm animals, unfurling a world in which children might be allowed to let their curiosity roam and to express their feelings freely.

The Mingei Philosophy and its Effect on Contemporary Ceramic Craft

Presenter: Ruth Duncan
Faculty Advisor: Haelim Allen

The Mingei craft movement, created by philosopher Sōetsu Yanagi, sought to counter the ever-increasing mass production of cheap goods and to offer handmade, affordable goods to the average patron. The movement's resulting impact continues to inform the field of functional ceramics on a global level. Due to its influence, Mingei has become a foundational aesthetic and philosophical ideology of ceramics in both the East and West, bringing attention to the beauty, value, and sincerity of folk pottery. This research focuses on the core tenets of Mingei philosophy and their influence on contemporary, functional ceramics worldwide.

Methods in Which Art Therapy Can Engage Children with Autism Spectrum Disorder

Presenter: Anna Claire Winchester
Faculty Advisor: Haelim Allen

As children mature into adulthood, they are expected to become independent on social, emotional, and cognitive levels. However, those diagnosed with Autism Spectrum Disorder (ASD) tend to struggle with these expectations. Art therapy is an experiential approach that fosters verbal communication and other interpersonal relationship skills, while addressing other non-social symptoms of ASD as well. The art making process provides creative ways to engage the senses through such materials as crayons, markers, paints, wood, textiles, and clay. Through manipulating these materials, the client is able to find an alternative means of expression alongside learning coping strategies for their repetitive and obsessive driven behaviors. Therapy with the inclusion of art making is an excellent method to engage clients with ASD in order to create an overall better quality of life for them. ■

BIOLOGY

Investigating the Effects of *Pseudomonas fluorescens* on the Intestinal Barrier in Zebrafish

Presenter: Cooper Bullough
Faculty Advisor: Hannah Henson

Inflammatory bowel disease (IBD), which includes Crohn's disease and ulcerative colitis, causes chronic inflammation of the intestinal tract. Mechanisms behind the pathology of the disease are not fully understood, however, previous studies indicate that certain strains of bacteria residing in the intestines may contribute to the disease. Additionally, no cure exists and treatments simply manage symptoms. This research used zebrafish *(Danio rerio)*, as a model organism to investigate the effects of the bacteria *Pseudomonas fluorescens* on the intestinal barrier. Zebrafish larvae were grown for five days and then exposed to *P. fluorescens* for two days. The fish were then treated with a small fluorescent tracer, and were imaged using fluorescence microscopy to determine if the intestinal barrier had been disrupted by the bacteria. Complete results remain to be determined, but our preliminary data suggests that fish treated with bacteria show more fluorescence outside of the intestinal tract than control fish.

Creating DNA Constructs to Make a Transgenic Zebrafish Line

Presenter: Jordan Crawford
Faculty Advisor: Hannah Henson

Clusterin is a glycoprotein that is used in many physiological pathways and is thought to contribute to many different diseases including cancers and Alzheimer's disease. Specifically, it is involved in cell death pathways and oxidative stress. Because of Clusterin's involvement in Alzheimer's disease, a better understanding of its role in this pathology is needed. This project used the zebrafish *(Danio rerio)* as a model system to determine Clusterin's role in physiological and disease pathways. Using the Tol2 transposon system, DNA constructs containing the *clusterin* promoter and the green fluorescent protein (GFP) were generated. These constructs will allow GFP to act as a fluorescent marker for *clusterin* expression. Injecting these constructs into zebrafish embryos will allow the fluorescence from the GFP to be tracked throughout zebrafish development, thereby allowing *clusterin* expression to be traced as well. The results of this experiment are pending.

BIOLOGY

Effects of Vitamin D on Deiodinase 3 Levels in Adult Zebrafish *(Danio rerio)*

Presenter: Cordelia Moss Hoverson
Faculty Advisor: Faith Zamamiri-Davis

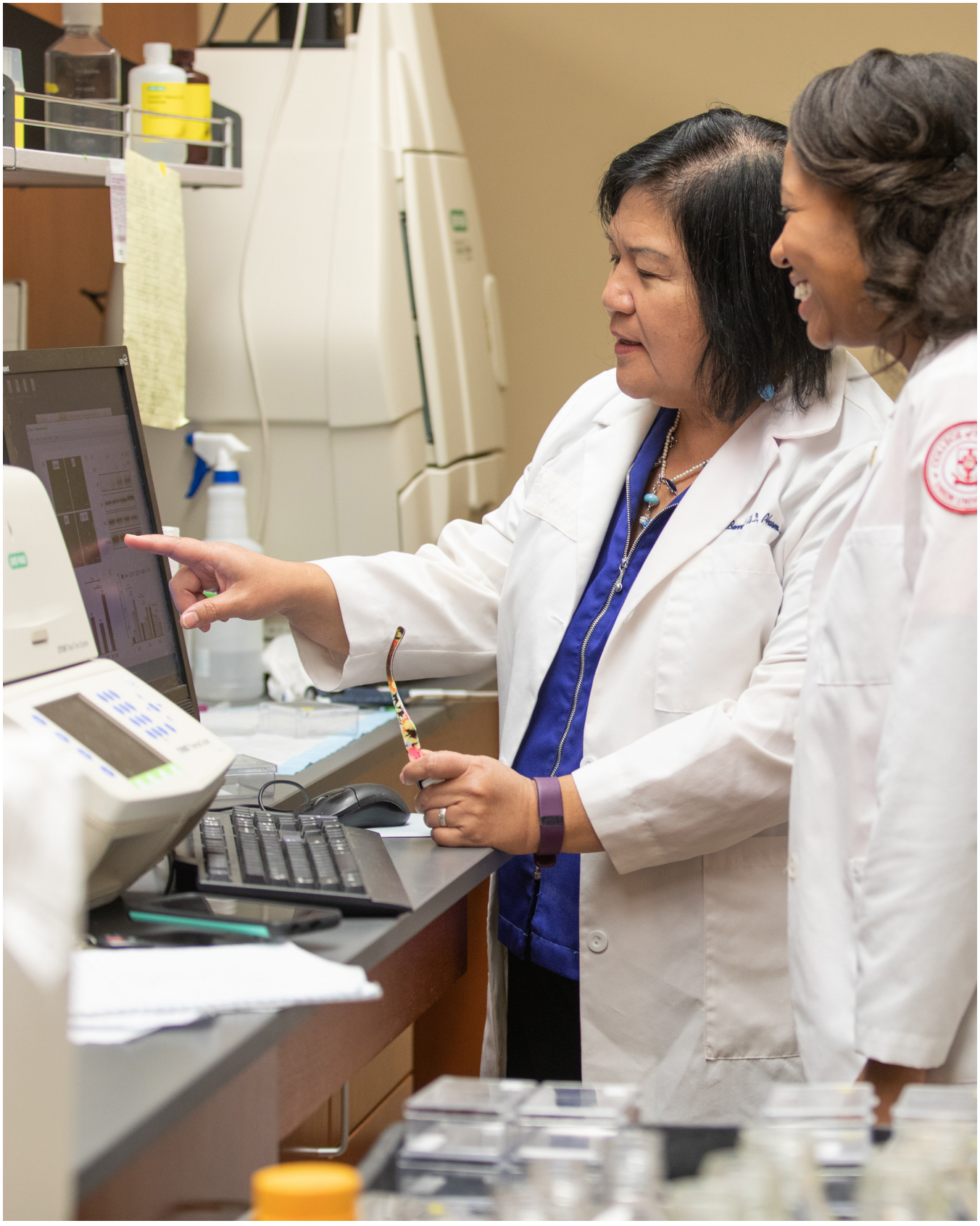
This experiment examined a potential link between vitamin D and type III iodothyronine deiodinase 3 (DIO3). Elevated DIO3 can be indicative of thyroid disease, as DIO3 catalyzes conversion of active thyroid prohormones and hormones into inactive forms. Zebrafish *(Danio rerio)* are a good model for thyroid disease studies due to similar gene patterning for the thyroid between zebrafish and mammals. Zebrafish were divided into control and experimental groups, and the experimental group was exposed to exogenous vitamin D at 5 µM for 1 week. RNA was extracted, and quantitative reverse transcription PCR (RT-qPCR) was used to measure DIO3 expression. Initial analysis of data shows no significant difference in DIO3 expression in treated zebrafish when normalized to 2 reference genes. Limitations of this study, including small sample size and unstable reference genes, suggest a need for further research using adult zebrafish to explore the relationship between vitamin D and DIO3.

Meleagris gallopava Assessment at the Milan Army Ammunition Plant

Presenter: Samuel Ross
Faculty Advisor: Andy Madison

Wild turkeys *(Meleagris gallopava)* are an abundant game species throughout Tennessee. To prevent over-harvesting, population assessments are needed to determine the status of individual populations. This project provides an assessment of the wild turkey population on the Milan Army Ammunition Plant. Beginning in late winter/early spring of 2020 we collected turkey population data from all areas of the MAAP. Randomly selected road strip-transects were conducted throughout the study area beginning in the afternoon hours of late March/early April. Transitioning to late spring, gobbler point-counts were conducted beginning 30 minutes prior to sunrise, lasting for three hours. Statistical analyses of these data are pending, but we expect to observe more wild turkeys than we hear. Upon reviewing results, we will have an updated, concise account of the wild turkey population on the MAAP, thus allowing us to manage the study area appropriately for future wild turkey populations. ■

PHARMACY



PHARMACY

Clausena anisata Leaf Induced Cell Death in Human Mesothelioma Lung Cancer MSTO Cell Lines via Inhibition MEK 1, 2, and 4, MTOR, and Cyclin B1

Presenters: Sean Halsey and Lunawati L. Bennett

Clausena anisate is an evergreen tree native to the tropical regions of Africa, where its leaves are commonly used to treat various diseases, relieve sore throats, and detox the body. The *Clausena anisate* leaf (CAL) is also commonly used as an antiseptic which is applied to external wounds and sores. The purpose of this study was to determine the effects of CAL on mesothelioma lung cancer cells (MSTO). Mesothelioma is a type of lung cancer which is primarily caused by asbestos exposure. This type of cancer has been estimated to kill about 43,000 people each year worldwide. HEK 293 kidney cells were also tested in order to determine CAL's effect on normal cells. Western Blots were performed on untreated MSTO, MSTO treated with CAL, and HEK treated with CAL. The concentration of CAL was determined based on prior MTT results. The results demonstrate a significant up-regulation of Cytochrome C, P53, and PARP 89. The results also show a significant down-regulation of MDM2, P21, Cyclin B1, MTOR, Caspase 9, Histone, Beta Catenin, and MEK 1, 2, and 4. These results together suggest that CAL likely can be used as an effective treatment against mesothelioma lung cancer.

Piper guineense Leaf Induced Cell Death in Human Mesothelioma MSTO-211H Cell Lines via Inhibition of MEK and Cell Cycle

Presenters: Josiah Hays and Lunawati L. Bennett

Mesothelioma, a cancer affecting the lining of organs such as the lungs, is responsible for the deaths of 2,500 Americans and about 38,000 people worldwide yearly. It is caused by exposure to asbestos, a chemical used in fireproofing buildings, used mostly in developing countries. Several drugs that target mesothelioma have been tested, but few have been successful. *Piper guineense* leaf (PGL) is an extract from an African plant, which is used to flavor African cuisine and has been used as an antibacterial agent. The objective of this study was to investigate and to understand the effects of PGL in mesothelioma (MSTO) cell lines. Both MSTO and healthy kidney cells (HEK 293) were treated with PGL. After treatment with the PGL, cellular protein was collected and a Western Blot analysis was performed to detect genes involved in the cell signaling pathways. The results showed down-regulation of MEK, cyclins, Wnt, ROCK, and Src in MSTO when exposed to PGL. MEK proteins aid cancer growth by allowing the cancer cells to communicate with each other; therefore, down-regulation of MEK shows that the growth of cancer cells is inhibited. Overexpressed cyclins, such as cyclin B1 and cyclin D1, cause cancer cells to proliferate invasively and prevent the cells from undergoing apoptosis. Wnt plays a role in cancer development, while ROCK and Src cause cancer cells to metastasize. Further investigation is needed to determine other pathways involved in MSTO cell signaling with PGL treatment. ■

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The Fall Poster Session is sponsored by
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