Online Proceedings

Poster Session 2

Balcony, Easel 101

1:00 PM to 2:30 PM

Do pH Levels Impact the *Cis-Trans* Isomerization Preference in Proline Attached Dipeptides?

Stephanie Torres, Sophomore, Biochemistry, Bellevue Coll
Mentor: Sonya Remington-Doucette, Science Division, Bellevue College
Mentor: Grady Blacken, Chemistry, Bellevue College
Mentor: Lucas Monkkonen, Chemistry, Bellevue College

A protein's function is dependent on its structure, which is made up of amino acids. Proline, (an amino acid) is known to cause the kinks and turns in protein structures. However, little is known about the influence of pH on the isomeric preference of proline-attached dipeptides. For this experiment, the isomeric preference of methionine-proline was measured in 10% solutions for pH levels of 7 and 11, the pH of the human body falls between the range of 6 and 9. At pH 11, NMR-90 spectra showed that the *cis-* isometric form was preferred at a rate of 14% more than the *trans-* isometric form, measured by the alpha hydrogen. At neutral pH of 7 *trans-* isomers are preferred 36% more than the cis- form measured by the alpha hydrogen and 73% more measured by the delta hydrogen. In conclusion, this experiment supports the hypothesis that proline-attached dipeptides' isomerization is pH dependent and is more likely to be in *cis-* form when in high pH in comparison to a neutral pH. The purpose of this experiment is to determine if pH levels can change the structure of a protien, with further research exploring if the change of structure changes the function. This is important to determine if medications containing amino acids can have an optimal or range of pH.

Poster Session 4

Balcony, Easel 96

4:00 PM to 6:00 PM

Determination of Microplastic Pollution Through Home Dryer Ventilation Exits

Dylan Corbett, Junior, Diagnostic Ultrasound Technician, Bellevue Coll
Mentor: Richard Glover, Science, Lane Community College
Mentor: Lucas Monkkonen, Chemistry, Bellevue College

Plastics are a ubiquitous part of modern life, without them many issues in the food, medical, and textile industries would be near insurmountable. However, our failure to consider life cycles of materials containing plastics have led to a global environmental threat. As polymers break down through degradation, they can create microplastics (MP's) or fibers that can escape into the environment. Microplastics are generally less than 5mm. Recent studies have indicated that endangering levels of MP's have been found in the oceans. Little to no research has been conducted on the quantity of MP's found in freshwater bodies and land far from the influence of the ocean. Little is known about the amount of MP's released during a clothing dryer cycle. To address sources of MP's created from a clothing dryer, samples of lint were collected beneath the dryer vent exits. Aggregate characterization of the samples were performed using attenuated total reflectance infrared (ATR-IR) which allowed samples to be evaluated based on a measured wavelength of a reflected beam of light. Samples collected were representative of MP's that would shed from textiles during a drying cycle and be distributed into the air. To effectively characterize and count MP's in solution a fluorescent dye (Nile Red) was used to stain the samples before imaging with a Fluorescent Microscope. Most dryers have a mesh screen to catch lint which has been useful, but it doesn't capture all the microfibers during a drying cycle. Still, hundreds if not thousands of microfibers evade the lint filter and are likely being released from the vent. The potential consequences of not regulating the release of MP's correlate with the growth of the textile industries. An important first step to this problem involves similar research to better understand the origin and release of MP's into the environment.

Poster Session 4

MGH 241, Easel 123

4:00 PM to 6:00 PM

Susceptibility Testing to Determine Antibiotic Resistance in *Staphylococcus aureus*

Angshita Dutta, Sophomore, Pre-Sciences
Mentor: Maria Nelson
Mentor: Lucas Hoffman, Pediatrics and Microbiology

Cystic Fibrosis (CF) is a genetic disorder associated with chronic, polymicrobial lung infections. One of the most common treatments for these infections involves inhalation of the antibiotic Tobramycin, used to treat *Pseudomonas aerugi-*

nosa infections. Tobramycin's effect on other members of the CF respiratory microbial community is unclear. The Tobramycin inhaled powder (TIP) study assessed the effect of Tobramycin on the entire respiratory microbial community before, during and after one month of therapy and demonstrated that, on average, *Staphylococcus aureus* viable counts dropped during the first week of therapy before returning to pre-therapy levels. However, there was variability in the response in viable counts to antibiotics in different patients with some that did not change at all throughout the course of drug therapy and no individual clearing their S. aureus infection. The purpose of this study is to better understand why Tobramycin did not clear *S. aureus* in people with CF as well as determining why patients responded differently. We initially hypothesized that the infection was not cleared due to antibacterial resistance to Tobramycin. I answer this question using standard susceptibility tests on Tobramycin, Cefoxitin, Sulfamethoxazole and Levofloxacin. The use of four different antibiotics help determine if the bacteria are resistant to Tobramycin and if there is a viable alternative to Tobramycin. We anticipate that results will show a shift from susceptibility before therapy to resistance after week one due to the proportion of resistant bacteria increasing. CF lung infections can be a model for many other diseases as well and we hope that this study may provide more insight into how to treat these infections better.