Online Proceedings

POSTER SESSION 3

MGH 241, Easel 165

2:30 PM to 4:00 PM

Comparison of Salivary Cortisol Concentrations between Agricultural and Urban Communities

Carly Erin Strecker, Senior, Biology (General)
Mentor: Elaine Faustman, Environmental & Occupational Health Sciences, Institute for Risk Analysis and Risk Communication

Exposure to environmental stress can impact health and affect well-being. Specific populations, such as low-income and minority women, may experience increased exposure to environmental stress and be at a higher risk of related health impacts. In order to better characterize susceptibility to stress and the related health effects, it is necessary to quantify the exposure. Exposure to stress triggers the release of the hormone cortisol, allowing it to be used as a biomarker. The objective of this study was to evaluate acute and chronic salivary cortisol levels within- and between-individuals and communities specifically characterizing the stress responses within a Hispanic agricultural community and a low-income non-Hispanic urban community. Saliva samples were taken from 27 Hispanic women living in an agricultural setting and 28 non-Hispanic women living in an urban environment. To measure short-term variability within- and between-individuals, four saliva samples were collected five times per day for two consecutive days. To measure long-term variability, a second set of samples was collected ten weeks later. Samples were collected by placing an oral swab in the mouth for one minute. Cortisol concentrations were quantified using a cortisol enzyme-linked immunosorbent assay (ELISA). We evaluated daily average salivary cortisol concentrations and diurnal indexes from samples taken consecutively and ten weeks apart to characterize acute and chronic within-individual variability. Similar evaluations were made within the agricultural and urban communities to better understand between-individual variability. On average, we found evidence of diurnal variation in both the agricultural and urban communities. Within individual variability was substantial in both communities as well, both on the short and long-term. These analyses support evidence that in order to evaluate differences in environmental stress exposure between as well as within individuals, robust biomonitoring methods are needed to fully characterize different levels of cortisol.

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The Effect of Archival Duration on the Quality and Quantity of Urine MicroRNAs

Alexander Alex (Alex) Artemenko, Senior, Biochemistry
Mentor: Elaine Faustman, Environmental & Occupational Health Sciences, Institute for Risk Analysis and Risk Communication
Mentor: Sara Pacheco, DEOHS
Mentor: Sungwoo Hong, Environmental & Occupational Health Sciences

MicroRNAs are a class of post-transcriptional regulators that silence messenger RNAs. MicroRNAs are interesting molecules to study because they are stable at room temperature and are long lived unlike messenger RNA. These characteristics make them useful molecular biomarkers to monitor disease and exposure status. For example, urine microRNAs have been used clinically as potential diagnostic markers of bladder cancer. However, their utility in non-clinical settings has yet to be elucidated. The goal of this study is to compare total RNA isolated from fresh and archived urine field samples to investigate their quality and quantity over time. RNA will be isolated from both whole urine and urine sediments and will be analyzed using multiple techniques. To date we have optimized the methodology required to isolate total RNA from the whole urine sample and the sediment. In a preliminary study, we isolated total RNA from samples under various conditions (fresh vs. field; whole urine vs. sediment) and compared them using the Nanodrop and Bioanalyzer. Our results demonstrate that RNA can be isolated from both fractions under both conditions. The molecular profiling of the RNA suggests that the urine samples contain only small RNAs because they lack ribosomal RNA peaks. Interestingly, the profiles look similar for all urine samples examined. In light of this, we performed an additional microarray experiment to characterize and identify the small RNAs present in the whole urine and sediment samples. These results are currently in progress. Using the information obtained from the preliminary microarray study, we will select the 3 most abundant microRNAs present in the urine for further analysis using RT PCR techniques to determine whether archival duration has an effect on their stability. The results of this experiment will provide valuable insight on the utility of archived

field samples for the future development of urine biomarkers.