

Kady Palmer

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August 10, 2017

443-995-9176

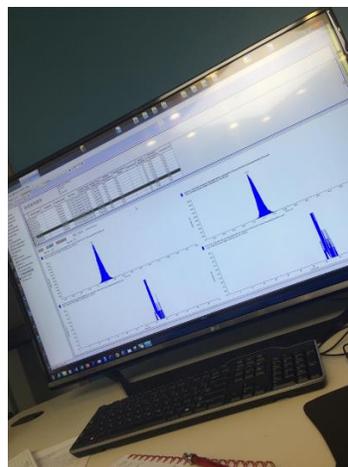
MANATEE BLOOD RESEARCH MAY INCREASE KNOWLEDGE OF CHEMICAL
CONTAMINANT EXPOSURE EFFECTS IN HUMANS

*Plasma samples may link perfluoroalkyl acid (PFAA) exposure to abnormal health
measurements.*

What chemicals are hiding in the everyday products we use? Are they safe? Perfluorinated chemicals are something most people have never heard of, yet come in contact with almost daily. These chemicals are used in non-stick cookware, stain and water resistant sprays, firefighting foam, even food packaging. Because of their ubiquitous presence, countless people may be unknowingly subject to possible negative health consequences through a variety of exposures. NSF REU intern Kady Palmer (affiliated with the National Institute of Standards and Technology, NIST), is analyzing a subset of these chemicals called perfluoroalkyl acids (PFAA) from a different perspective than basic human studies. She is looking at potential health effects in the West Indian manatee, a marine mammal that can be potentially exposed from mechanisms currently unknown.

Data analysis and statistical measurements determined location-based differences of PFAA concentrations in manatees throughout Florida and Puerto Rico. In addition, correlations were found between a number of blood chemistry variables, water temperature at the time of sampling, and PFAA measurements within blood plasma. With this information, a basis for further investigations is established in order to determine potential health effects of PFAAs in not only manatees, but in humans as well.

Previous studies have looked at organisms such as alligators and fish, yet none have looked at plant-eating aquatic mammals. Even though these organisms live under or near the water, and they are not using household products, they could be exposed by the infiltration and absorbance of PFAAs into their food. NIST research chemist Dr. John Bowden states, "the research Kady is performing tackles a fundamental gap in our current understanding of PFAA exposure in the environment, hopefully providing new insight into other mechanisms by which PFAAs can integrate into wildlife". While accumulation within fish species seems to be a potential indirect source of exposure for humans, West Indian manatees provide a complementary model for chemical contaminants in mammals due to their herbivorous dietary habits and low predatory stresses. From there, links to human exposure via other dietary habits, not just eating fish, can be further investigated.



Plasma samples obtained from 69 manatees were utilized to compare variables such as location and health to PFAA exposure measurements.

The project uses a chemical extraction method, to isolate perfluoroalkyl acid (PFAA) concentrations from a component of manatee blood, known as plasma. Plasma carries proteins throughout the bloodstream and PFAAs are known to stick to these proteins. Therefore, this method can effectively gauge the abundance of PFAAs within an individual.

If organisms like the manatee depict negative health consequences as a result of these chemicals, what could they be doing to the overall health of humans? By determining the presence of PFAAs in manatee plasma, a deeper understanding of the toxicity of these chemicals can be established, therefore increasing potential solutions in regards to the health of this threatened species, in addition to the health of humans exposed.

For more information, visit: <https://blogreu.wordpress.com>

References:

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This work was supported by the Fort Johnson REU Program, National Science Foundation Award No. DBI-1359079 to the Grice Marine Lab, College of Charleston.