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## **Chickens and Gators: Sentinel Species for Human and Environmental Health**

*What organism health and development can tell us about us*

The effect of anthropogenic contaminants on environmental and organismal health has become a major source of concern in recent years. Some pollutants have been found to alter hormonal function in the body and are classified as endocrine disrupting contaminants (EDCs). Due to the crucial role of hormones in the body's general regulation, any disruption to their normal function could potentially be hazardous to health. Researchers are able to study these health hazards through the study of sentinel organisms such as the chicken and the alligator.

Despite appearing to be very different from humans, these organisms are amniotes in the animal kingdom, a group that includes reptiles, birds, mammals, (and, therefore, humans). While some lay eggs and others bear live offspring, amniotes share similar reproductive characteristics.

Jimena Pérez-Viscasillas, an undergraduate at the University of Puerto Rico at Mayaguez and a summer intern at the College of Charleston, has been researching one of these shared characteristics, the chorioallantoic membrane, in chicken eggs. The chorioallantoic membrane, or CAM, is the membrane which lines the inside of the eggshell. It contains a lot of the same tissues found in the human placenta and shares some of its functions, such as waste removal and gas exchange. Recently, it was discovered that much like human placentas, it is capable of producing steroid hormones.

Under the mentorship of PhD student Theresa Cantu and Dr. Louis Guillette of the Medical University of South Carolina (MUSC), Pérez-Viscasillas is studying whether the CAM is also capable of producing a different class of hormones, prostaglandins, and whether their levels change throughout development. Prostaglandins are hormones which play a major role in the body's immune system, as well as in reproduction. In human beings, the placenta produces these hormones at varying concentrations during pregnancy. Understanding prostaglandin synthesis in the CAM of egg-laying amniotes

could later lead to observations on how they are altered by contaminants in the environment. It would allow for a better understanding of organism health in their environment, as well as a look into how contaminants affect immunity, reproduction, and development. "If we can actually show there are problems in these wildlife populations, it raises a flag for our own health," says Guillette. "It doesn't mean that everything we find in wildlife we're going to find in humans, but we have to look at that. If we're finding there are abnormalities in wildlife, we need to address those issues and how we are in fact dealing with the ecosystem and the world around us."

Pérez-Viscasillas is one of ten selected students participating in the National Science Foundation (NSF)'s Research Experience for Undergraduates (REU) through a partnership with the College of Charleston. To learn more about her research and the CofC REU program visit the blog: <http://www.blogreu.wordpress.com/> and CofC Web site: <http://reu.cofc.edu/>.



Left: Chorioallantoic membrane (CAM). Above: Pérez-Viscasillas (right) and her mentor, Theresa Cantu, holding alligator eggs.

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