Mueller talks weird science at RTP event

By Eddy Ball

NIEHS staff scientist Geoffrey Mueller, Ph.D., was one of ten local scientists featured April 16 in the Research Triangle Foundation 180 Degree series *(http://www.rtp.org/)* event Weird Science. The series of events is designed to celebrate the collaboration between the Research Triangle, N.C., universities, companies, and communities. Mueller, a structural biologist, discussed "The Structural Characterization of Allergens."

Mueller is part of the NIEHS Nuclear Magnetic Resonance Group headed by Robert London, Ph.D. He said his interest lies in decoding allergic reactions. "What is it about those few specific proteins that become allergens that makes them special?" (Photo courtesy of Steve McCaw)

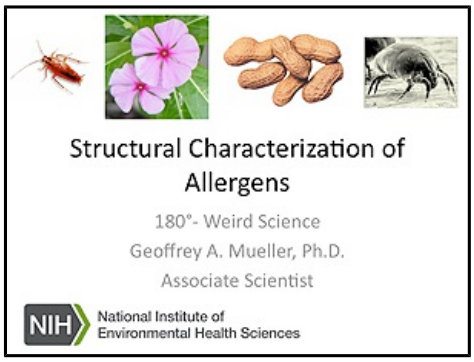
Linked Video

Watch Mueller's talk at the Research Triangle Foundation event (04:38)

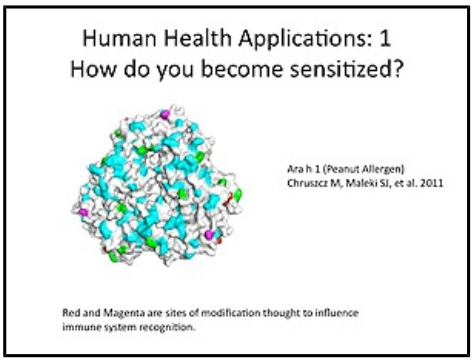
Emceed by entrepreneur and comic Will Hardison, the event was an entertaining combination of stand-up comedy and unusual science, delivered rapid-fire in audience-friendly five-minute segments. Topics ranged from the mind-boggling potential of the new Geomagic *(http://www.geomagic.com/en)* 3D printing technology, which makes off-the-grid design and manufacture of products, tools, and even weapons possible, to the utterly gross sample collection practices of Duke University biologist William Parker, Ph.D., *(http://sciences.surgery.duke.edu/research/institutes-and-labs/parker-lab)* who catches his own rats to study their intestinal parasites as part of his research into gut biology.

The fast-paced presentation by Mueller fell somewhere in the middle range on the scale of weirdness. His magnified images of a dust mite and the guts of eviscerated cockroaches could be described as gross, but Mueller was entirely serious when it came to his commitment to understanding inappropriate immune responses that threaten human health and sometimes even human life.

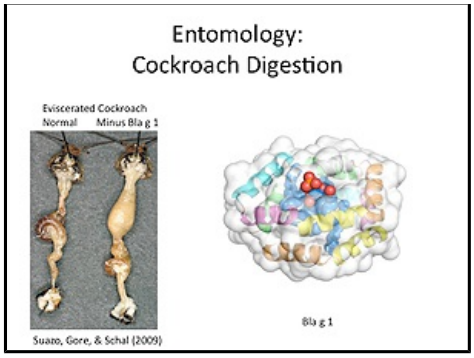
After all, Mueller told the audience, "I work at the National Institute of Environmental Health Sciences, and we like to think of what we do as very serious science." By determining crystallographic structures of proteins, Mueller and other structural biologists are gaining new insights into the mechanisms involved in allergic reactions, and discovering new potential targets for developing safer forms of immunotherapy to reverse the allergic process.



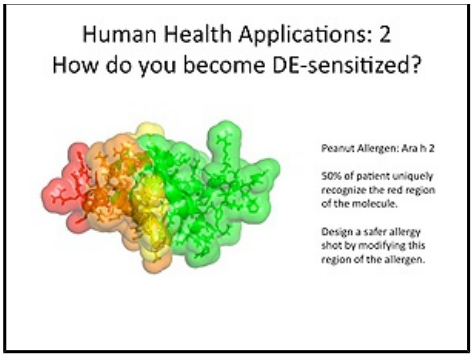
Mueller focused on the most common allergies to indoor and outdoor exposures and food among people in North America — cockroach dander, periwinkle pollen, peanuts, and dust mite dander. (Photo courtesy of Geoffrey Mueller)



Crystallographic imaging allows scientists to see what otherwise would remain hidden. Mueller's team mapped onto Ara h 1 peanut protein sites that are modified during the cooking process. (Photo courtesy of Geoffrey Mueller)



The German cockroach gene Bla g 1 appears to regulate fat formation, shown in blue. Unfortunately for people looking for a weight control miracle, Mueller said humans don't have a counterpart to that gene, although they are allergic to the protein that Bla g 1 encodes. (Photo courtesy of Geoffrey Mueller)



According to Mueller, this discovery marks the point where basic science findings have the potential for translation into strategies to improve human health. (Photo courtesy of Geoffrey Mueller)

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