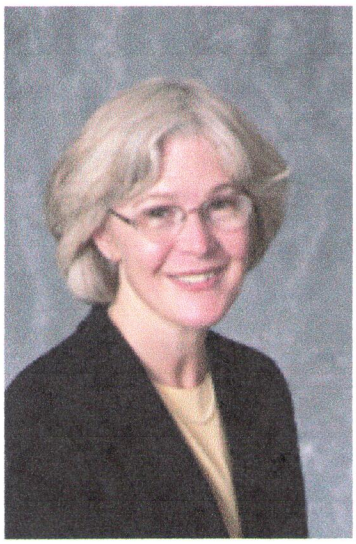
INDIANA UNIVERSITY DEPARTMENT OF BIOLOGY

THE SONNEBORN LECTURE 2003



SHARON LONG

Stanford University

"Genetic and Genomic Studies of *Rhizobium* Symbiosis"

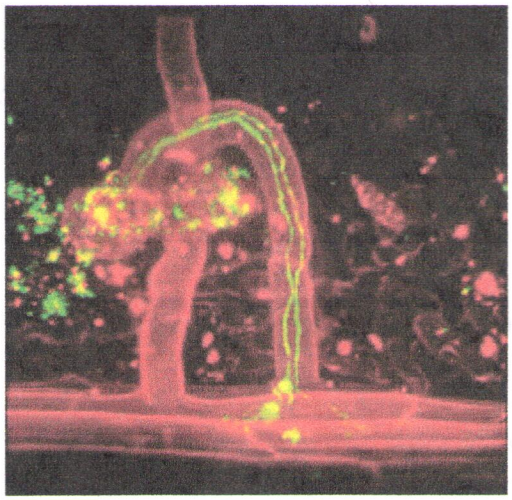
Tuesday, October 21
4:00pm, Myers 130

Sharon R. Long is Dean of the School of Humanities and Sciences and the William Steere Jr.-Pfizer Inc. Professor of Biological Sciences at Stanford University. Dr. Long received her B.S. from the California Institute of Technology, her Ph.D from Yale University, and conducted postdoctoral research at Harvard University.

Dr. Long has earned numerous awards and honors for both research and teaching. She has been a member of the National Academy of Sciences since 1993. She is the author or co-author of over 100 research and review articles

Dr. Long's research has focused on the symbiosis between Rhizobium bacteria and plants in the legume family. Her laboratory was one of the first to tease apart the complex chemical signaling process that occurs between these bacteria and legume roots. This work included the identification of molecules secreted by legume roots that induce "nodulation" genes in the bacterium. Dr. Long's group subsequently showed that the products of these nodulation genes function to synthesize "Nod factors", which induce dramatic oscillations in calcium levels in host root hairs (for a cool movie, check out http://cmgm.stanford.edu/biology/long/Ca_spike_movie_V_flatraw.mov), and major changes in root hair growth patterns and gene expression. These changes enable the bacteria to infect root hairs and induce formation of nodules. It is inside these nodules that the bacteria fix atmospheric nitrogen into ammonia, enabling legumes to grow in nitrogen poor soils, and enabling farmers to enrich their soils by cultivating legumes such as alfalfa and soybean.

Dr. Long's group has recently designed a combined Rhizobium-Medicago Affymetrix Chip for following the simultaneous changes in gene expression in both the host and symbiont during the formation of nitrogen-fixing nodules. Data generated using this DNA chip are being used to construct a dynamic model of gene regulation during the nodulation process.



Sinorhizobium meliloti invading an alfalfa root hair.

A reception in the Jordan Hall atrium will follow the lecture.