UAH
Mathematical Sciences

Dr. Karen A. Ames Lecture Series on Applied Mathematics

Dr. Mary Ann Horn

National Science Foundation
And Vanderbilt University

Challenges Arising in the Study of the Development and Spread of Antibiotic Resistant Bacteria

DATE: **October 31, 2014**

TIME: **3:00 p.m.**

LOCATION: **SC Room 218**

Drug resistance has been an emerging problem since the discovery of penicillin. Resistance is now seen not only in clinical settings, but also increasingly in the community. Bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA) impacts healthy adults as well as patients in settings such as hospitals and nursing homes. MRSA is an example of a Gram-positive bacteria. More recently, antibiotic resistance in Gram-negative bacteria such as *Escherichia coli* and *Salmonella aureus* is an increasing problem. A primary difference between Gram-positive and Gram-negative bacteria is the composition of the cell walls, which results in the two types of bacteria having different mechanisms to acquire resistance. This talk will give an overview of some of our recent work on modeling of the development and spread of antibiotic resistance, ranging from common hospital acquired infections to those that have arisen in the community. (Joint work with Erika D'Agata, Shigui Ruan, Joanna Wares, and Glenn Webb.)

Dr. Mary Ann Horn currently has served for ten years as a Program Officer in the Division of Mathematical Sciences within the Directorate of Mathematical and Physical Sciences at that National Science Foundation (NSF). She moved to NSF after receiving tenure at Vanderbilt University and still holds a position as an Adjoint (Non-Resident) Professor of Mathematics at Vanderbilt. She has handled programs in Mathematical Biology and Applied Mathematics, as well as worked across disciplines, in particular, through collaborations with programs in the Directorate of Biological Sciences, the Directorate of Engineering, and the Directorate of Social, Behavioral, and Economic Sciences, as well as with other agencies such as the National Institutes of Health. Her research interests include nonlinear dynamical systems, infectious disease, cellular signaling, and control theory, all areas in which she has authored papers.

Dr. Horn serves on the Board of the Society for Industrial and Applied Mathematics and is a Director for the Society for Mathematical Biology. She has received a number of awards and recognitions, including the National Science Foundation Award for Program Management Excellence and the Alexander von Humboldt Fellowship. She has also held visiting positions at the Université de Metz, the Technische Universität Darmstadt, the École Normale Supérieure de Cachan, and the Royal Institute of Technology in Stockholm.

Refreshments will be served at 2:30 p.m. in SC 201 suite landing