VOICES OF DISCOVERY

he College of Arts and Sciences at Elon University is committed to engaging students and the community in the excitement and wonder of discovery. During the past two decades, scores of discoveries in molecular biology, atomic physics and computer technology have changed the face of science and brought dramatic changes to our world.

The Voices of Discovery speaker series brings to campus preeminent scientists and mathematicians who have left an indelible mark on the way we view the world. They share their remarkable experiences and perspectives with Elon students and the community. This series plays a fundamental role in the university's commitment to create a science-conscious community and to help students be informed citizens.

Voices of Discovery is just one element of Elon's program to provide outstanding science education. At the Dalton L. McMichael Sr. Science Center, students work in modern laboratories with cutting-edge research tools. They focus on discovery-based learning, undergraduate research and collaboration among the sciences, developing an appreciation for the scientific enterprise and how we acquire new knowledge.

VOICES OF DISCOVERY // 2012-13

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ELON UNIVERSITY 2012–13 VOICES OF DISCOVERY

ENHANCING THE WEALTH OF OUR OCEANS: NEW APPROACHES TO MARINE MANAGEMENT

WEDNESDAY, SEPTEMBER 12, 2012 MCCRARY THEATRE 7:30 P.M.

Robert T. Deacon, Ph.D.

Professor, Department of Economics and Bren School of Environmental Science & Management, University of California, Santa Barbara // University Fellow, Resources for the Future, Washington, D.C.

recent article in Science projected that due mainly to over-fishing, all groups of marine organisms now commercially fished would collapse by the year 2048. Pending catastrophes, both ecological and economic in nature, are not at all new in this realm. Neither are the steps normally recommended to stave off disaster: increasingly severe fishery closures, tighter restrictions on fishing effort and gear, and expansion of marine protected areas.

Prior experience with these remedies, which rely on regulating behavior in a top-down fashion, gives little reason to hope that the gloomy forecasts will be avoided. New approaches are being tried, however, and give reason for optimism that the twin goals of marine conservation and economically healthy fishing sectors can be achieved simultaneously. These new approaches are based on assigning secure rights to influence how the resource is used, but their success depends on the ability of those holding rights to exclude outsiders from exploiting the resource.

While accumulating experience with this management approach is encouraging, obstacles often must be overcome to render it feasible and to realize its full potential. Among these are the contentious problem of deciding who will be granted rights and the difficulties posed by dysfunctional host country governments. Dr. Deacon's research on fisheries in countries with diverse governance institutions indicates that these obstacles are not insurmountable. and provides guidance on adapting management to deal with them.

Dr. Deacon received his Ph.D. from the University of Washington and is now professor of economics and environmental science and management at the University of California, Santa Barbara. Dr. Deacon has authored numerous research articles on natural resource management and the interface between political systems and policy design. He also consults on these topics for international agencies and conservation organizations.

PERSONALIZED MEDICINE: THE RIGHT TREATMENT FOR THE RIGHT PATIENT

MONDAY, NOVEMBER 5, 2012 MCCRARY THEATRE 7:30 P.M.

Marie Davidian, Ph.D.

William Neal Reynolds Professor of Statistics, North Carolina State University // Director, Center for Quantitative Sciences in Biomedicine, North Carolina State University

he Human Genome Project was completed early in the 21st century and potential applications of the human genomic map are still being imagined. One rapidly emerging application is that of personalized medicine or "individualizing" treatment for a given patient based on his or her specific genetic makeup and other characteristics to determine the best therapies and outcomes. There is growing interest among the general population and health care providers for this new approach to diagnosis and treatment.

While the approach of personalized medicine is already present in clinical practice, such as in the treatment of hypertension or certain cancers, many scientists and health care providers believe that progress in moving from genomic science to effective clinical application has been slow and of mixed success. This has been explained by the complexity of steps involved in identifying genetic markers for disease and measuring clinical outcomes of treatment options applying rigorous and reliable statistical methods to the entire process.

Dr. Davidian, the William Neal Reynolds Professor of Statistics at North Carolina State University and current president-elect of the American Statistical Association, is very interested in the evolution of personalized medicine. She has analyzed clinical data and reports of personalized treatments and suggests that "despite stories in the media hailing the promise of personalized medicine, successes have been few. The goal of personalizing treatment requires making sense of vast, complex data and understanding the mechanisms of disease. Statistics and mathematics are essential tools to talking these problems and uncovering optimal strategies for individualizing treatment."

Dr. Davidian holds an adjunct professor position in biostatistics and bioinformatics at Duke University and collaborates with biostatisticians and clinicians at the Duke Clinical Research Institute.

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For more information about the departments of biology, physics/engineering, chemistry, mathematics and statistics, environmental studies and computing sciences, or the Voices of Discovery speaker series, call the Elon College, the College of Arts and Sciences at 336-278-6263.



HOW MUCH SHOULD YOU KNOW ABOUT YOUR INTESTINAL MICROBES?

MONDAY, MARCH 11, 2013 MCCRARY THEATRE 7:30 P.M.

Christian Jobin, Ph.D.

Associate Professor, Department of Medicine, Pharmacology, Immunology/Microbiology, University of North Carolina at Chapel Hill



undreds of species of nonpathogenic bacteria live in unimaginable numbers inside the human intestine, constituting the beneficial indigenous microflora of the bowel. So significant are

these bacterial populations in association with the gut that they have been referred to as an organ and their various roles in the maintenance of normal gut anatomy and physiology are still being unraveled. Most of us recognize the importance of these non-pathogenic residents of our intestines only when their presence has been disrupted, as it may be the case following a regimen of powerful antibiotics.

But how do body cells and tissues live peacefully with certain bacteria yet wage chronic immunologic war against pathogenic species? What mechanisms permit immunological tolerance of certain bacteria and what would be the result of a disruption of these mechanisms of co-existence? Evidence suggests that a major consequence of disruption in the relationship between non-pathogenic intestinal microflora and the host is the condition known as inflammatory bowel disease(s) and the associated development of colitis-associated colon cancer. Dr. Jobin's work seeks to better understand the mechanisms by which the body lives peacefully with bacteria in order to eventually design therapies to restore disrupted relationships that produce inflammation and possibly cancer.

Dr. Jobin earned his Ph.D. in immunology and microbiology from Laval University in Quebec, Canada. With more than 80 publications in prestigious journals such as Science and Journal of Immunology, he is considered a leader in the field of host immune responses and intestinal microflora, and has received numerous awards such as the Mucosal Immunology Society Award and the American Gastroenterological Association Fiterman Basic Research Award. His research is supported by grants from the National Institute of Health and the American Institute of Cancer Research.