Purdue Agricultural Research Programs

Presents the 2003 Agricultural Research Award To Dr. Arun K. Bhunia

Friday, April 18, Whistler Hall
2003
Agricultural Research Award Presentation & Seminar

In honor of Dr. Arun K. Bhunia

2:00 p.m. Friday, April 18, Whistler Hall, Room 116

Schedule

2:00  Welcome & Award Presentation
2:15  Seminar: “Exploiting Pathogenic Signatures of Listeria monocytogenes for the Development of Biosensor-Based Detection Tools”
3:10  Reception
Purdue University
Agricultural Research Award

Established in 1982, the Agricultural Research Award recognizes research excellence by a faculty member in the Purdue University School of Agriculture with less than 15 years experience beyond the Ph.D.

The award consists of a plaque, a $1,000 honorarium funded by earnings in the Charles Guthrie Patterson Memorial Endowment and Matthew Morgan Hamilton Funds, and $5,000 for the recipient’s research program.

Purdue Agricultural Research Programs bestows this award annually to recognize a scientist who has demonstrated a high level of excellence in the application of scientific principles to the solution of important research problems and who has, through his or her research, made significant contributions to agriculture, natural resources, and quality of life of Indiana citizens.
Arun K. Bhunia
Associate Professor of Food Science
2003 Agricultural Research Award Recipient

Arun K. Bhunia believes in balance—sometimes between things others see as opposites.

He balances art and science. Bhunia paints watercolors and brings the same passion for perfection and appreciation of technique to his science that he does to his art. A microbiologist, he collaborates closely with engineers like Rashid Bashir, Mike Ladisch, and Mark Morgan in efforts to develop increasingly sensitive and useable sensors to detect pathogens in food before it reaches consumers.

Most notably, Bhunia balances basic science and applied science as he focuses on that most pathogenic of pathogens, *Listeria monocytogenes*.

This bacterium is virtually everywhere in nature. It can be found in meat, poultry, seafood, and vegetables. While some individuals can consume food contaminated with *L. monocytogenes* and suffer no harmful consequences, others, like infants, those over 60, and those whose immune systems have been compromised, can suffer a host of problems ranging from diarrhea and headaches to meningitis and encephalitis. Some even die.

On the one hand, Bhunia seeks to characterize the “lifestyle” of what he calls the “elusive organism” in as much detail as possible. He wants to understand—precisely—how *L. monocytogenes* binds and penetrates the intestinal cell wall and thereupon kills the cell.

That could be characterized as the “basic end” of Bhunia’s scientific balancing act.

And the other hand, the “applied end”? One important example is his team’s development of a sensitive and rapid biosensor-based, two-step method of detecting *L. monocytogenes* in food. The method employs immunomagnetic beads to capture the bacterial cells and a cytotoxicity assay to detect them.
The method is “sensitive” in that it is capable of detecting *L. monocytogenes* in concentrations of less than 1 CFU/ml (colony-forming unit per milliliter) of food extract. This is important because, in a recent outbreak, a concentration of one colony-forming unit per gram of meat proved fatal to some individuals.

The method is “rapid” in that it detects *L. monocytogenes* in less than 24 hours. This is important because conventional methods take from two to as many as seven days. That’s too long and too late. By that time, the contaminated food has reached the consumer—and the damage has been done.

Bhunia and his colleagues are currently testing their method on naturally contaminated hot dogs and working to make the technology more useable by the food processing industry. They are also at earlier stages on other promising methods for detection of foodborne pathogens.

Bhunia earned his Ph.D. in food microbiology from the University of Wyoming in 1989, having chosen to come to that institution from his native India in part because of the promise of financial assistance and in part because of the influence of Bibek Ray, who became his major professor. While at Wyoming, he says he benefited greatly from the “wonderful discussions” he had with colleague Craig Johnson. Bhunia then spent five years at the University of Arkansas, where he worked with Michael Johnson, and three years as a member of the faculty at Alabama A&M University.

In 1998, Purdue’s Department of Food Science recruited him. This was a wise move by the department and a good move for Bhunia, who says there is “everything here” necessary for scientific development, including top-notch facilities, stimulating colleagues, and challenging students.

Bhunia is the author or co-author of 48 refereed articles and 15 monographs and book chapters, has delivered 15 invited lectures, and has supervised or is supervising 10 M.S. candidates, 10 Ph.D. candidates, and 3 post docs. He is also on the Editorial Board of the *Journal of Food Protection* and serves as an ad hoc reviewer for six other international journals and several grant programs.

For the balance and the breadth of his scientific accomplishments and for their enormous potential to benefit the quality of life for citizens in Indiana and, indeed, the world, Purdue Agricultural Research Programs is proud to bestow the 2003 Purdue Agricultural Research Award on Dr. Arun K. Bhunia.
Agricultural Research Award
Recipients

1982 Robert L. Thompson
   Department of Agricultural Economics

1983 John H. Cushman
   Department of Agronomy

1984 Wallace E. Tyner
   Department of Agricultural Economics

1985 Michael R. Ladisch
   Department of Agricultural Engineering

1988 Peter E. Dunn
   Department of Entomology

1989 Phillip C. Abbott
   Department of Agricultural Economics

1990 Martin R. Okos
   Department of Agricultural Engineering

1991 Nicholas C. Carpita
   Department of Botany and Plant Pathology

1992 Mark A. Diekman
   Department of Animal Sciences

1993 Jeffrey J. Volenec
   Department of Agronomy
1994  W. Randy Woodson  
Department of Horticulture
1995  Thomas W. Hertel  
Department of Agricultural Economics
1996  Allan P. Schinckel  
Department of Animal Sciences
1997  S. Suzanne Nielsen  
Department of Food Science
1998  Bernard A. Engel  
Department of Agricultural and Biological Engineering
1999  Sally A. Mackenzie  
Department of Agronomy
2000  Bruce Hamaker  
Department of Food Science
2001  Clint Chapple  
Department of Biochemistry
2002  K.G. Raghothama  
Department of Horticulture