Eighteenth Lecture in the Series

# James P. Holland Memorial Lecture

**Monday, October 23, 2017**, at 4:00 p.m.

Myers Hall 130 (915 East Third Street)
Indiana University Bloomington campus

## Worms, germs, and buffalo: a coinfection story


## Vanessa Ezenwa, Ph.D.

Professor, Odum School of Ecology and Department of Infectious Diseases, College of Veterinary Medicine, University of Georgia



Concurrent infection by multiple parasites can shape the trajectory and outcome of infectious diseases. For example, coinfections with parasitic worms can affect the progression and severity of microbial infections, including many viral and bacterial infections. Although an increasing number of studies are investigating the consequences of worm-microbe coinfections in laboratory settings, we still know very little about the repercussions of coinfection in natural environments. This is despite the fact that a majority of hosts (including humans) are infected with multiple parasites simultaneously. To understand the impacts of worm coinfection in natural populations, my laboratory studies interactions between gastrointestinal worm infections and bovine tuberculosis in free-ranging African buffalo. Using a coupled experimental and longitudinal study design, our work is revealing that both active infection with worms, and the host's constitutive response to worm infection, have profound implications for the outcome of tuberculosis at the individual and population levels.



**Thanks to our generous Indiana University Holland lecture sponsors:**

Office of the Vice President for Diversity, Equity, and Multicultural Affairs
Office of the Vice Provost for Faculty and Academic Affairs
Office of the Vice Provost for Research
College of Arts and Sciences
Department of Biology
Medical Sciences Program


## *About Vanessa Ezenwa*

Courtesy photo

**Vanessa Ezenwa** is internationally recognized for her research on the consequences of parasite coinfection. Her insights have great implication on how we treat and manage infections. Members of the Ezenwa lab study the ecology of infectious diseases with a specific focus on linking processes across scales—from cell to biosphere. They investigate how behavioral, physiological, and ecological processes at the individual level shape interactions between hosts and their parasites, and the consequences for population and community-wide patterns of disease. Their work combines field studies with laboratory approaches and theory to address key questions about the ecology of infectious diseases in wild animal populations.

### Professional Experience

Professor, Odum School of Ecology & Dept. of Infectious Diseases, College of Veterinary Medicine, University of Georgia, 2017–present; Associate Professor, 2012-17; Assistant Professor, 2010-2012
Assistant Professor, Division of Biological Sciences, University of Montana, 2005-2010

### Education

U.S. Geological Survey, Postdoctoral Fellow, Geographic Analysis of Disease, 2003-05
Princeton University, Postdoctoral Fellow, Ecology & Evolutionary Biology, 2002-03
Princeton University, Ph.D., Ecology & Evolutionary Biology, 2002

### Honors

University of Georgia Creative Research Medal, 2016
Fulbright Scholar Award (France), 2014-15
Zoetis Award for Veterinary Research Excellence, 2014
National Science Foundation CAREER Award, 2008

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### Holland Lecturers

2000 Homer A. Neal
2001 S. Allen Counter
2002 Tyrone B. Hayes
2003 Scott V. Edwards
2004 Maydianne Andrade
2005 Ivette Perfecto
2006 Erich D. Jarvis
2007 Paul Turner
2008 Rick Kittles
2009 Harmit M. Singh
2010 Carlos Bustamante
2011 Adriana D. Briscoe
2012 Cassandra G. Extavour
2013 Paul Barber
2014 Joaquín M. Espinosa
2015 Graciela A. Unguez
2016 Eva Nogales

### Holland Teaching Award Recipients

Michael Tansey
Akwasi B. Assensoh
Robert B. Affe
Massimo Scalabrini
George Malacinski
Georgia K. Strange
Albert Ruesink
Bruce Solomon
Richard B. Miller
James H. Madison
James M. Walker
Christoph Irmscher
P. David Polly
Anne Pyburn
Eric Sandweiss
Constance Furey
Mark Messier
Amy Berndtson

### Holland Fellows

1998-99 Liana Bulmer
2000-01 Antiño Allen
2001-02 Jan Lee Santos
2002-03 Christopher Boston
2003-04 Leleña Avíla
2004-05 Adrian Land
2005-06 Kyle Wayne
2006-07 Adrienne Jones
2007-08 Samuel Miller
2008-09 Lesley Weaver
2009-10 Sheya Martin
2010-11 Nikki Rendon
2011-12 Delawrence Sykes
2012-13 David Thoms
2013-14 Aisha Burton and Amilcar Perez
2014-15 Lekeah Durden
2015-16 Jay Goldberg
2016-17 Anne MacKenzie

## About James Holland and the Lecture Series

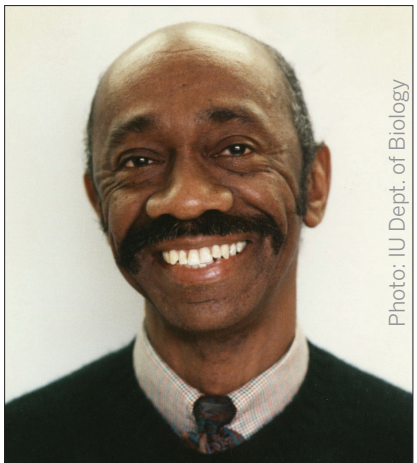
Photo: IU Dept. of Biology
Professor James P. Holland, 1934–1998

The James P. Holland Memorial Lecture Series was initiated in the fall of 2000, and is now organized by the Herman C. Hudson and the James P. Holland Scholars Program and the Department of Biology. The lectures honor the memory of one of the most beloved faculty members on the Bloomington campus. Professor Holland had a passion for teaching that earned him virtually every teaching award offered on campus, including the President's Award for Distinguished Teaching. This lecture series honors his legacy and is designed to bring awareness of and support to diversity in the life sciences.

Professor Holland worked tirelessly to address the needs of minority students. He created biology's summer enrichment program, which brings Indiana minority high school students to campus to attend science lectures and participate in hands-on laboratories. The program is designed to spark their interest in science and provide a taste of college life. Holland and the late Herman C. Hudson joined forces to found IU's Minority Achievers Program (MAP) and the Mathematics and Science Scholarship Program (MASS). In 2003 the programs were named after Hudson and Holland to honor the efforts of these two men.

James Holland came to Indiana University to study zoology, earning a master's degree in 1958 and a doctorate three years later. Holland was on the Howard University faculty until 1967, when he returned to IU as an associate professor in the Department of Biology, advancing to full professor in 1974. His research involved reproductive endocrinology, and he examined the mechanism by which thyroid hormones influence female reproductive physiology.

From recruiting and mentoring students to serving as associate dean and interim dean of the graduate school, Professor Holland's commitment to the university was exceptional. He was a recipient of IU's Distinguished Service Award, the Herman B Wells Lifetime Achievement Award, and the Distinguished Alumni Service Award. Jim Holland taught over 11,000 undergraduates during his IU career, and his talent for teaching earned him a FACET award, given to exceptional teachers who inspire both students and colleagues. He was the first to receive the Chancellor's Medallion for his "transcendent efforts on behalf of the university."

It was his wife, Constance, who created the **James Philip Holland Teaching Award for Exemplary Teaching and Service to Students**. Mrs. Holland—a highly respected, award-winning secondary school teacher—established the award to recognize others who shared the Hollands' passion for teaching. Israel Herrera-Cárdenas, senior lecturer in the Department of Spanish and Portuguese, is this year's recipient.

## About the Holland Fellowship

Biology established the James P. Holland Graduate Fellowship in Biology to honor Professor Holland, who died of cancer at the age of 63. He was a member of our faculty for 31 years, loved science, and—as indicated above—was a truly dedicated teacher and mentor.

The Holland Fellowship supports the training of a first-year Ph.D. graduate student from groups underrepresented in the life sciences. It provides stipend, tuition, and health insurance during the first year of graduate training for the Ph.D. degree. The total support package amounts to a minimum of $64,209 per year. For more information about the fellowship, visit https://biology.indiana.edu/about/alumni-giving/holland-fellowship.html.