Indiana University Department of Biology

Spring 2013 Sonneborn Lecture

Photo courtesy of Princeton University, Office of Communications

Eric F. Wieschaus

Investigator, Howard Hughes Medical Institute

Squibb Professor of Molecular Biology

Princeton University

Nobel Prize Recipient, 1995

"Cellular Mechanics and Cell Shape Change during *Drosophila* Gastrulation"

April 16, 2013
4:00 p.m.
Myers Hall 130

After the lecture there will be a reception outside of Myers Hall 130.

Hoosier native Eric Wieschaus is known for his groundbreaking work with the fruit fly, *Drosophila melanogaster*. Wieschaus received the Nobel Prize in Physiology or Medicine with Christiane Nüsslein-Volhard and Edward B. Lewis for their discoveries concerning the genetic control of early embryonic development. These developmental biologists were able to identify and classify a small number of genes that are of key importance in determining the body plan and the formation of body segments.

Wieschaus and Nüsslein-Volhard established that genes controlling development could be systematically identified, that the number of genes involved was limited, and that they could be classified into specific functional groups. This encouraged a number of other scientists to look for developmental genes in other species, and in a relatively short time it was possible to show that similar or identical genes also existed in higher organisms and in man.

Three years after their research was published, in 1980 in the journal *Nature*, researchers Matthew Scott and Amy Weiner, working in the Indiana University Bloomington laboratory of Distinguished Professor of Biology Thomas Kaufman, identified the homeobox in fruit flies, a DNA-binding gene sequence that encodes proteins, which tell cells what kinds of structures to make in various segments of a developing embryo. Shortly after that discovery homeobox genes were quickly found in the genomes of mice and humans.

"Eric and his colleague Janni Nüsslein-Volhard bravely embarked on a screen for mutations in *Drosophila* that affected embryonic patterning," Kaufman said. "It is fair to say that the ground breaking results of their screen were paradigm shifting in the way we think about the genetic regulation of developmental processes. Moreover, the impressive number of novel and previously unknown genes they identified created an entire new wave of investigation and seeded the careers of numerous young investigators. They did the seminal work that changed a field and they were richly deserving of this recognition."

Wieschaus graduaded magna cum laude from the University of Notre Dame in 1969. He earned his Ph.D. from Yale University in 1974, and was awarded the John Spangler Nicholas Prize for outstanding doctoral work in experimental zoology. Wieschaus did postdoctoral training with Rolf Nothöger at the University of Zurich. He joined the Princeton faculty in 1981 and was appointed Squibb Professor of Molecular Biology in 1993.

Wieschaus is a member of the National Academy of Sciences, a fellow of the American Academy of Arts and Sciences, a member of the American Philosophical Society, an associate member of the European Molecular Biology Organization, and a foreign member of the Max Planck Society. He is the recipient of the Genetics Society of America Medal, the Mendal Medal from the Genetics Society (UK), and was inducted into the National Institute of Child Health and Human Development's Hall of Honor.

History of the Sonneborn Lectures

To honor his contributions to science and his outstanding career, Tracy Sonneborn's friends and colleagues initiated the Sonneborn Lectureship. This is the 31st lecture in the series.

Aside from a few years at Johns Hopkins University, where he received the Ph.D. degree, Tracy Sonneborn spent his entire career at Indiana University. His devotion to the study of Paramecium established him as the world leader in biology and genetics of Protozoa; indeed it is no exaggeration to say that he founded the modern era of study in these areas. One of his major contributions was in demonstrating that preexisting structures in cells can repeatedly determine the patterns of new structures through many generations. Although recognized as an important exception to Mendelian inheritance and a critical element in prion diseases, the mechanism of structural inheritance in biology is not yet understood. "Whatever the final outcome of studies of these phenomena, he must take his place among the most brilliant and devoted experimentalists in the history of biology and a true giant, like no other, in the field of protozoan research," John Preer, http://newton.nap.edu/ html/biomems/tsonneborn.html. With precision, thoroughness, and infectious enthusiasm, Tracy Sonneborn also contributed unstintingly to teaching at Indiana University. In spite of the many attempts to entice him away, he remained loyal to IU, finding here the environment he thought was best.

Courtesy of the IU Archives

Tracy L. Sonneborn, 1905 – 1981

Note: For more information on Dr. Sonneborn, read John Preer's essay and his 2006 commentary in *Genetics* 172:1373–1377.

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Previous Sonneborn Lectures

1981 Charles Yanofsky
1982 Donald D. Brown
1983 Philip Leder
1984 Gerald R. Fink
1985 David S. Hogness
1986 Mark Ptashne
1987 David Botstein
1988 Franklin Stahl
1989 Ira Herskowitz
1990 Thomas R. Cech
1991 Elizabeth H. Blackburn
1992 Melvin I. Simon
1993 Christiane Nüsslein–Volhard
1994 Christine Guthrie
1995 Gerald M. Rubin
1996 Lucy Shapiro
1997 Randy W. Schekman
1998 James Forney, Eric Meyer, Meng-Chao Yao, and John Preer
1999 John Kilmartin
2000 Elliot Meyerowitz
2001 David Prescott
2002 Philip Hanawalt
2003 Sharon Long
2005 Cynthia Kenyon
2006 J. Richard McIntosh
2007 David Baulcombe
2009 Terry L. Orr–Weaver
2010 Tian Xu
2011 C. David Allis
2011 Joseph G. Gall