



**Scott F. Gilbert** is the Howard A. Schneiderman Professor of Biology, *emeritus*, at Swarthmore College, where he has taught developmental genetics and embryology for 36 years. He is also a Finland Distinguished Professor, *emeritus*, at the University of Helsinki Department of Biotechnology. He received his B.A. in both biology and religion from Wesleyan University, and he received his PhD in biology and his MA in the history of science from The Johns Hopkins University. Scott has authored over 175 publications, focusing on the interactions between embryology, genetics, and evolution. His research involves how novel structures evolve through changes in development, and he has focused on how the turtle gets its shell. Scott currently has three books in print: *Developmental Biology*; *Ecological Developmental Biology* and *Fear, Wonder, and Science in the New Age of Reproductive Biotechnology*, a bioethics trade-book concerning fertilization, early human development, and infertility. Scott has been awarded the Alexander Kowalevsky Medal in 2004 for his work in evolutionary developmental biology. He has also the Medal of François I from the Collège de France, the Dwight J. Ingle Memorial Writing Award, honorary doctorates from the University of Helsinki (Finland) and the University of Tartu (Estonia), the Viktor Hamburger Prize for Excellence in Education from the Society for Developmental Biology. In 2016, he presented a developmental biology lecture to His Holiness, the Dalai Lama.

#### *Ecological Developmental Biology*

Ecological developmental biology ("eco-devo") is a truly integrative biology, detailing the interactions between developing organisms and their environmental contexts. Eco-devo is a new science, studying development in the "real world" of predators, pathogens, competitors, symbionts, toxic compounds, temperature changes, and nutritional differences. These environmental agents are often necessary for normal development, often implemented when signals from the environment elicit epigenetic changes in gene expression. Ecological developmental biology also provides a systems approach to the study of pathology, integrating the studies of diabetes, cancers, obesity, and the aging syndrome into the framework of an ecologically sensitive developmental biology. Ecological developmental looks at examples where the environment provides expected cues for normal development and where the organism develops improperly without such cues. The study of epigenetics--changes in gene expression that are not the result of changes in a gene's DNA sequence--has recently provided startling insights not only into mechanisms of development, but also into the mechanisms and processes of evolution. The notion that epialleles (changes in chromosome structure that alter gene expression) can be induced by environmental agents and transmitted across generations has altered our notions of evolution, as have new experiments documenting the genetic fixation of environmentally induced changes in development. The widespread use of symbiosis in development provides new targets for natural selection. Ecological developmental biology integrates these new ideas into an extended evolutionary synthesis that retains and enriches the notion of evolution by natural selection.