BIOGRAPHICAL SKETCH

L.Z. Holland

A. Professional preparation:

Education:	Stanford University (BA in Biology 1962)
	Stanford University (MA in Biology 1964)
	University of California San Diego (PhD in Marine Biology 2001)
B: Appointments:	Scripps Inst Oceanography, UCSD, Research Biologist (1998-present)
	Scripps Inst Oceanography, UCSD, Specialist (1993-1998)
	Scripps Inst Oceanography, UCSD, Staff Research Associate (1987-1993)
	Scripps Clinic and Research Foundation, Research Assistant (1982-1986)
	Dept. of Biology, UCSD, Staff Research Associate (1974-1982)
	Dept. of Biology, UCSD, Laboratory Assistant (1970-1973)

CURRENT RESEARCH INTERESTS:

My long-term goal is to understand how vertebrates evolved from their invertebrate ancestors. To this end, we use the cephalochordate amphioxus (*Branchiostoma*) as a model for the common ancestor of amphioxus and vertebrates. To date, our studies of developmental genetics in amphioxus have given insights into evolution of vertebrate-specific structures such as neural crest and into evolution of the gastrula organizer among others.

My present research involves

1) Establishing breeding cultures of the Florida amphioxus (*Branchiostoma floridae*). This goal, which we have recently achieved, is to obtain spawning of amphioxus outside the normal summer breeding season and to establish transgenic lines.

2) The evolution and function of alternative splicing with particular reference to Pax genes.

3) The evolution of the genetic mechanisms mediating somite segmentation.

4) The evolution of head segmentation.

5) Comparative genomics of *Branchiostoma floridae* and the second genus of amphioxus, *Asymmetron lucayanum.*

SYNERGISTIC ACTIVITIES:

Broadening participation of women and under-represented minorities: Each year since 1992, when we received our first NSF grant to study amphioxus, I have involved 1-2 undergraduates, both REU students and volunteers, in research. These 21 students included 16 females, 4 from under-represented minorities and one physically handicapped. Most have gone on to careers in biology or medicine. One is an assistant professor in evo-devo; another a high school biology teacher, a third a postdoctoral fellow in biology, a fourth a fisheries biologist and a sixth is a research technician. In connection with the *Assymetron lucayanum* genome project, which I am doing together with NH Putnam, Rice Univ. and my former student J-K Yu, Academia Sinica, Taiwan, I will host one of NHP's graduate students at SIO. Since 1998, when I was appointed to the Research Faculty and, therefore, allowed to mentor graduate students and postdoctoral fellows, I have been the major professor of five graduate students, one of whom is an under-represented minority and received an NSF pre-doctoral fellowship, and mentored six postdoctoral fellows-- two women, one an underrepresented minority and one physically handicapped. All are currently in academe as faculty, researchers or postdoctoral fellows. In 2011, as active retirees at SIO retain their space, I officially retired to devote all my grant funds to the lab.

World-wide collaborations: Since beginning to study amphioxus in 1988, I have frequently collaborated with researchers from many countries. First, each summer since 1988, we have set up a laboratory at the University of South Florida and invited researchers the world over to do research on amphioxus and learn

techniques such as microinjection. In the last 6 years, researchers, their students and postdoctoral fellows have come from Barnard University and University of Colorado in the USA, from the Czech Republic, several universities in Japan, Taiwan, EMBL in Germany, the UK, Australia and Italy. In addition, J-K Yu from Taiwan came to SIO in May 2012 to collaborate on *Asymmetron*, and Z. Kozmik, a long-time collaborator from the Czech Republic will come in spring 2013. Since 2005, two of his students as well as a student from Guanzhou, China have worked in my laboratory for several months to learn in situ hybridization techniques. I am currently collaborating with NH Putnam and J-K Yu and their students on the *Asymmetron* genome project. In addition, the *Branchiostoma floridae* genome project, which I led (published in 2008) involved collaborations with over 70 researchers from 10 countries.

Public Service: Chair Society of Integrative and Comparative Biology, Division of Evolution and Development (2008-2010). Edited a special "Amphioxus Genomics" issue of *Briefings in Functional Genomics*" (2012). Associate editor for the Americas of the *International Journal of Developmental Biology*, editorial advisory board for *Nature Communications*; editorial boards of *Evodevo*, *Evolution and Development;* Panel member NSF Evolution and Development (2010); co-organizer of Symposium on "Insights of early chordate genomics: endocrinology and development in amphioxus, tunicates and lampreys" for the Society of Integrative and Comparative Biology 2010. Reviewer for numerous journals including *Nature*, *Genome Research*, *BMC Biology*, *Developmental Cell*, *Nucleic Acids Research* and others and for granting agencies in the USA and France.

Invited Presentations: Symposium in Honor of Dra. Meredith Gould Chambers, Autonomous University of Baja California, Ensenada Mx (2007); Karger Symposium, Neuroscience Meeting, San Diego, CA (2007); Symposium on Genomes and Evolution, Guangzhou, China (2008); Symposium on Evolution of Nervous Systems at Fondation Les Treilles, France (2008); Sea Urchin Meeting, Woods Hole, MA (2008); Department of Biology, University of California Santa Barbara (2008); 125th Anniversary of the Observatoire (Station Zoologique) in Villefranche/mer France (2010), Institut Pasteur, Paris France (2010), University of Lausanne, Switzerland (2010); Symposium of the Neuroscience Research Program of the Federal University of Rio de Janeiro, Brazil (2010); Neuroscience Department. University of Illinois, Chicago (2011), International Congress of Invertebrate Morphology, Boston, MA (2011); Asia Pacific Developmental Biology Congress (2012), Euro EvoDevo meeting, Lisbon, Portugal (2012).