

Genes in Vertebral Development



Scott Holley

Associate Professor, Department of Molecular, Cellular and Developmental Biology

CURRENT RESEARCH

Understanding the genetic basis of birth defects and cancer

The human body has analogies to the economy. An individual gene is an individual person, which carries out a specific function in the larger organization of the cell much like a person functions in a business. These local, national, and global businesses then combine to create a larger economy. Economists spend a lot of effort modeling how individuals collectively produce the complex dynamics of the economy. Similarly in biology, individual genes combine functions to control cellular behavior. Cells then come together to create even more complex organizations from tissues like bone and muscle to organs like the heart and to the entire body. One difference is that biologists are able to perform controlled experiments to precisely establish cause and effect while such precision is difficult in economics. Dr. Scott Holley, Associate Professor of Molecular, Cellular and Developmental Biology at Yale University, studies how the embryo builds itself into a mature organism, or how genes control what cells do and how cells physically work together to create the musculoskeletal system. Through his discoveries, Dr. Holley reveals the mechanisms of human vertebral development and helps explain the genetic basis of both birth defects and cancer, providing insights that address some of our most pressing medical problems.

Scoliosis is one of the most common structural birth defects afflicting 1 in every 100 individuals. Since we do not yet fully understand the causes of potentially debilitating malformation of our backbone, it is hard to diagnose individuals with scoliosis that may eventually resolve itself and distinguish them from individuals with a mild form of scoliosis that is likely to worsen over time.

By...

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AFFILIATION



Yale University

EDUCATION

- Damon Runyon Cancer Research Foundation Postdoctoral Fellow in 2002, Max-Planck Institute for Developmental Biology, Tübingen, Germany
- Ph.D. in Molecular Genetics and Cell Biology 1997, University of Chicago
- B.S. in Biology 1991, Millsaps College

AWARDS

- Damon Runyon Cancer Research Foundation Postdoctoral Fellow
- Research Scholar, The American Cancer Society

RESEARCH AREAS

Life Science, Genomics / Congenital, Musculoskeletal, Regenerative Medicine

FUNDING REQUEST

Your contributions will support the continued research of Dr. Scott Holley and his lab at Yale University as they study the development of our backbone. The interdisciplinary research program requires \$1M/year, with donations helping to fund the salaries of scientists that perform the research, chemicals and reagents used in experiments, zebrafish care and maintenance, microscopy and other necessary equipment. Help define genes that cause scoliosis to facilitate early diagnosis!