

# Adult Stem Cells: The Driving Force for Tissue Replenishment and Repair



**Margaret Fuller**  
Professor, Developmental Biology and Genetics

## CURRENT RESEARCH


Defects in the pathways that normally replenish specialized cells in our bodies can lead to cancer

There are many cells in our bodies that only last a short time, for example red blood cells, skin, and the lining of the gut. Because these cells are so specialized, they cannot divide. However, they must constantly be replenished from less specialized precursor cells. This is done by a sophisticated mechanism in which adult stem cells proliferate then differentiate to replace cells that have died or are damaged. Dr. Margaret Fuller, Professor of Biology and Genetics at Stanford University School of Medicine, studies how specialized cells are produced from adult stem cells in the body. Her research is revealing fundamental cellular and molecular mechanisms that regulate how tissues are maintained and repaired. In addition, as many human cancers, including, breast, lung, prostate, and colon cancer arise in adult stem cell lineages, understanding the rules that strictly govern how the stem cells become activated to divide, how much their daughter cells proliferate, and how those daughter cells eventually stop dividing and differentiate into the correct specialized cells may be important for understanding and possibly treating cancer.

Dr. Fuller and her team are using powerful genetic and molecular tools available in the laboratory fruit fly *Drosophila* to discover how the differentiated male germ cells, the sperm, are produced throughout reproductive life, as a model system to study adult stem cell lineages in vivo. With an interest in the whole process, from how the stem cell niche works, to how proliferation is controlled, to how the gene expression program for terminal differentiation is turned on, Dr. Fuller and her laboratory group seek to understand the key regulatory points in...

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## AFFILIATION

 Stanford University

## EDUCATION

- A.B., in Physics, 1974, Brandeis University
- Ph.D., in Microbiology, 1980, Massachusetts Institute of Technology
- Postdoctoral Training, Developmental Genetics, 1983, Indiana University

## AWARDS

- Summa Cum Laude with Honors from Brandeis University, 1974
- Jane Coffin Childs Memorial Fund for Medical Research Postdoctoral Fellow, 1980-83
- Searle Scholar Award from the Chicago Community Trust, 1985-88
- Reed-Hodgson Professor of Human Biology, Stanford University 2004-present
- American Academy of Arts and Sciences, Member 2006-present
- and 2 more...

## RESEARCH AREAS

Life Science, Stem Cell, Regenerative Medicine, Oncology / Cancer

## FUNDING REQUEST

Your contributions will support the continued research of Dr. Margaret Fuller, at the Stanford University School of Medicine, as she studies how specialized cells are made from adult stem cells. Donations will fund the necessary \$400K/year required to support the graduate students, postdocs and technical personnel carrying out the research, animal care, specialized microscopy, and next generation sequencing to map gene regulatory mechanisms. Funding Dr. Fuller's research helps to support young scientists as they advance their training and strive to gain the results to publish and establish their careers. In choosing to donate, you can help reveal how specialized cells in our body are normally produced and how they can be replaced to repair injury.