



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
R1109

Project Title:  
Recruitment of Established Investigators

Award Mechanism:  
Recruitment of Established Investigators

Principal Investigator:  
Morrison, Sean

Entity:  
The University of Texas Southwestern Medical Center

### Lay Summary:

Dr. Sean J. Morrison, is the founding Director of the Children's Research Institute and the Mary McDermott Cook Chair in Pediatric Genetics at the University of Texas Southwestern Medical Center as well as an Investigator of the Howard Hughes Medical Institute.

The Morrison laboratory is investigating the mechanisms that regulate stem cell function in the nervous and hematopoietic systems and the ways in which these mechanisms are hijacked by cancer cells to enable neoplastic proliferation and metastasis. The Morrison laboratory is particularly interested in the mechanisms that regulate stem cell self-renewal, stem cell aging, and the role these mechanisms play in cancer. Parallel studies of these mechanisms in two tissues reveals the extent to which different types of stem cells and cancer cells depend upon similar mechanisms to regulate their function.

The Morrison laboratory has discovered a number of critical mechanisms that distinguish stem cell self-renewal from the proliferation of restricted progenitors. They have shown that stem cell self-renewal is regulated by networks of proto-oncogenes and tumor suppressors and that the balance between proto-oncogenic and tumor suppressor signals changes with age. This likely explains why the mutation spectrum changes with age in cancer patients, as different mechanisms become competent to hyper-activate self-renewal pathways in patients at different ages. The Morrison laboratory has further shown that in some cancers many tumor cells are capable of driving disease growth and progression while other cancers are driven by minority subpopulations of cancer cells that adopt "stem cell" characteristics. These insights into the cellular and molecular mechanisms of self-renewal have suggested new approaches for promoting normal tissue regeneration and cancer treatment.

Dr. Morrison completed a BSc in biology and chemistry at Dalhousie University (1991), then a Ph.D. in immunology at Stanford University (1996), and a postdoctoral fellowship in neurobiology at the California Institute of Technology (Caltech; 1999). From 1999 to 2011, Dr. Morrison was at the University of Michigan where he Directed their Center for Stem Cell Biology. Recently, Dr. Morrison moved to the University of Texas Southwestern Medical Center where he is the founding Director of the new Children's Research Institute. Dr. Morrison was a Searle Scholar (2000-2003), was named to Technology Review Magazine's list of 100 young innovators (2002), received the Presidential Early Career Award for Scientists and Engineers (2003), the International Society for Hematology and Stem Cell's McCulloch and Till Award (2007) the American Association of

Anatomists Harland Mossman Award (2008), and a MERIT Award from the National Institute on Aging (2009).