CHILDREN'S MEDICAL CENTER
RESEARCH INSTITUTE
AT UT SOUTHWESTERN

UT Southwestern
Medical Center

Stem Cells and Cancer

Postdoctoral positions are available in the laboratory of Sean Morrison, at Children's Research Institute, UT Southwestern Medical Center. Our laboratory studies the intrinsic and extrinsic mechanisms that regulate stem cell self-renewal and the role these mechanisms play in cancer:

- We study the intrinsic mechanisms within hematopoietic stem cells that regulate self-renewal, particularly in areas of cell biology that have been understudied in tissue stem cells. These areas include metabolic regulation (e.g. Nature 549:476) and the regulation of proteostasis (e.g. Nature 509:49). We develop new techniques that make it possible to study these aspects of cell biology in rare cell populations then use the techniques to discover new regulatory mechanisms. For example, we recently developed the ability to perform metabolomics in hematopoietic stem cells and are currently identifying new mechanisms of metabolic regulation in stem cells.
- We study the extrinsic mechanisms by which the niche regulates hematopoietic stem cell maintenance. We discovered that hematopoietic stem cells reside in perivascular niches (Cell 121:1109) and that their maintenance depends upon factors synthesized by endothelial cells and Leptin Receptor+ stromal cells (Nature 481:457; Nature 495:231). We developed the ability to perform deep imaging of these niches in cleared tissues (Nature 526:126) and are now identifying new mechanisms by which the niche regulates stem cell maintenance.
- We discovered that the LepR+ stromal cells include the skeletal stem cells that are the main source of osteoblasts and adipocytes in adult bone marrow (Cell Stem Cell 18:782). We also discovered a new bone forming growth factor, Osteolectin, and it's receptor α11 integrin, which maintain the adult skeleton by promoting the differentiation of LepR+ skeletal stem cells into bone (eLife 5:e18782; eLife 8:e42274). We are working now to better understand the biology of osteolectin, whether it could be used to treat bone diseases (such as osteoporosis), and what it tells us about the biology of skeletal regeneration.
- To identify mechanisms required for the self-replication of cancer cells but not the self-renewal of normal stem cells, we study melanoma metastasis. We developed a xenograft model (Nature 456:593) in which we have studied the metastatic properties of melanomas from 150 patients (Science Translational Medicine 4:159ra149). We discovered that distant metastasis is limited by oxidative stress (Nature 527:186), raising the possibility of pro-oxidant therapies that inhibit cancer progression. We are currently studying the mechanisms that protect melanoma cells from oxidative stress during metastasis, with the hope of taking new therapies into clinical trials.

Most students and postdoctoral fellows that have trained in the Morrison laboratory have gone on to tenure-track faculty positions. Other are scientists in biotechnology companies or private research institutes.

Candidates must hold a Ph.D. and/or M.D. degree and have a record of scientific productivity. Information on our postdoctoral training program and benefits can be found in our Postdoc Handbook or at UT Southwestern's Postdoctoral Scholars page. Interested individuals should send a CV to:

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UT Southwestern Medical Center is an Affirmative Action/Equal Opportunity Employer. Women, minorities, veterans and individuals with disabilities are encouraged to apply.