

YALE UNIVERSITY
SCHOOL OF MEDICINE

Department of Neurology
The Cardiovascular Research Center, #770B
300 George Street
PO Box 208020 New Haven, CT 06520-8020



Jean-Leon Thomas
Associate Professor of Neurology

One postdoctoral position is available in our laboratory on the topic of the bioengineering of neural stem cells (NSCs) for anti-aging and brain repair strategies

Open position from now and for 2 years with a one year-renewable contract

Laboratory Research: Our laboratory is interested in the biology of neural stem cells during development and in the adult brain. Our studies focus on the mechanisms controlling neural stem cell quiescence versus activation and on the role of neurovascular interactions in neural stem cell behavior. We are using molecular genetic approaches in mice and zebrafish as well as molecular analysis of human brain biopsies.

In collaboration with A. Eichmann's group (Yale Cardiovascular Medicine), we have shown that neural and endothelial cells use common signaling molecules, including the Netrin receptor UNC5B, Robo4, and Neuropilin1/2 to regulating capillary and lymphatic patterning and guidance. We have also found that vascular endothelial growth factor-C (VEGF-C), the key inducer of lymphatic vessel development, and its high-affinity receptor VEGFR-3, are critically required for neurogenesis. VEGF-C directly acts on VEGFR3-expressing neural stem cells (NSCs) in mice and humans, opening potential approaches for repair of neurodegenerative diseases.

Publications: Han J, *Cell Rep.* 2015 Feb 24;10(7):1158-72; Ristori E, *Dev Cell.* 2015 Mar 9;32(5):546-60; Bouvrée K., *Circ Res.* 2012 Aug 3; 111(4): 437-45; Eichmann A. and Thomas J-L. *Cold Spring Harb Perspect Med* 2013 Jan 1; 3(1): a006551; Calvo CF, *Genes Dev.* 2011 Apr 15;25(8):831-44; Le Bras B, *Nat. Neuroscience* 2006; 9: 340-348; Lu X, *Nature* 2004; 432: 179-86. Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/public/1PgT7IEFIAJBtGMRDdWFmjWAO/?sort=date&direction=ascending>

Project. Engineering hNSCs with VEGF-C: Applications for stroke recovery

The overall goal of this proposal is to use the mouse adult brain as an 'in vivo laboratory' to investigate the effect of VEGF-C on hNSC behavior and stroke recovery. To test this, we will combine molecular biology, bioengineering and brain imaging techniques to create artificial hNSC niches, composed of hNSCs secreting VEGF-C in a flexible manner and embedded in hydrogel microbeads. We will test VEGF-C releasing hNSC niches for their neurogenic and neuroprotective potential in the brain and determine VEGF-C potential to improve NSC activity and brain tissue recovery following a stroke injury. Analysis techniques include immunohistology, MRI and behavior assays. *Partners at Yale:* Anjelica Gonzales (Bioengineering), Fahmeed Hyder (MRI), Karen Hirschi and Anne Eichmann (Neurovascular interactions). *Funding:* NIH-NIBIB

Profile required: PhD. with at least 2 good papers as a first author in the field of developmental biology, cell biology, neurogenesis or neural stem cells. Expertise in stem cell culture (primary, iPSC- or ES-derived NSCs), stereotactic neurosurgery, brain tissue clarification (iDisco, Clarity), immunohistology, 3D-confocal and 2photon-imaging, electroporation- or viral-mediated gene transfer in the brain. English: fluent; Letters of reference (2-3).

Please send your CV, cover letter and letters of reference to jean-leon.thomas@yale.edu

Object: post-doctoral application