

SCOTT E. WILLIAMS, PH.D.

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CURRENT POSITION

University of North Carolina

Assistant Professor
Department of Pathology, Lineberger Cancer Center

Chapel Hill, NC

EDUCATION

Columbia University

Ph.D., M.Phil., M.A., Neurobiology & Behavior
Thesis: Axon guidance at the optic chiasm
Advisor: Carol A. Mason

New York, NY
2005

Brown University

A.B., Biology

Providence, RI
1996

RESEARCH EXPERIENCE

The Rockefeller University

Postdoctoral Fellow, Advisor: Elaine Fuchs

Role of asymmetric cell divisions in mammalian skin development

- Demonstrated for the first time in a mammalian system that *LGN*, *Numa1*, and *Dctn1* control orientated cell divisions.
- Discovered that asymmetric cell divisions promote epidermal stratification through regulation of Notch signaling.
- Developed lentiviral RNAi technology as a means for rapid gain- and loss-of-function studies of the genes that control mouse development.

New York, NY
2006-2013

Columbia University

PhD Student, Advisor: Carol A Mason

Control of retinal axon guidance at the optic chiasm

- Identified *ephrin-B2* and *EphB1* as the key repulsive guidance cues that establish binocular vision in vertebrates.
- Demonstrated that IgCAM family cell adhesion molecules control the midline crossing behavior of retinal axons.
- Elucidated a role for the *Slit-Robo* genes in patterning the chiasm region.

New York, NY
2000-2005

Cytotherapeutics (Stem Cells, Inc)

Research Associate, Device Biology group

- Developed synthetic growth substrates for engineered cell lines to be used in implantable devices for the treatment of neurological disorders.
- Optimized growth and delivery conditions for human neural stem cells used in a rodent neurodegeneration model.
- Promoted twice from summer intern to level 2 research associate in under two years.

Lincoln, RI
1996-1998

TEACHING EXPERIENCE

The Rockefeller University

New York, NY

- Supervised 3 graduate students in diverse rotation projects ranging from trans-criptional regulation of hair follicle stem cells to cytoskeletal control of epidermal differentiation. Continue to mentor one student who has since joined the lab.
- Instructed 2 high school students as part of Rockefeller's Science Outreach Program. Provided guidance for searching, reading and comprehending primary literature. Formulated a research plan, advised in recording and reporting data, and assisted in writing a competitive research report for Intel Science Talent Search.
- Wrote and maintained several widely distributed laboratory protocols. Trained both lab and non-lab members in lentiviral production and concentration.

Columbia University

New York, NY

- Planned curriculum, led weekly discussion sections, conducted review sessions and graded exams as an instructor for graduate level class in "Developmental and Systems Neurobiology."
- Mentored two first-year graduate students on projects investigating the role of Eph receptors and ephrin ligands in retinal axon guidance.
- Supervised and trained Columbia University student full-time for two summers and part-time during the academic year. Advised and assisted in poster, oral and written documentation of undergraduate research.

MOST SIGNIFICANT PUBLICATIONS

Williams SE, Beronja S, Pasolli HA and Fuchs E (2011). Asymmetric cell divisions promote Notch-dependent epidermal differentiation. *Nature* 470: 353-358. [Comment in *Nat Rev Genetics* 12: 226; F1000 reviewed]

Beronja S, Livshits G, **Williams SE** and Fuchs E (2010). Rapid functional dissection of genetic networks via tissue-specific transduction and RNAi in mouse embryos. *Nat Med* 16: 821-7.

Williams SE, Grumet M, Colman DR, Henkemeyer M, Mason CA, and Sakurai T (2006). A role for Nr-CAM in the patterning of binocular visual pathways. *Neuron* 50: 535-47. [Comment in *Neuron* 50: 519-21]

Williams SE, Mason CA, and Herrera E (2004). The optic chiasm as a midline choice point. *Curr Opin Neurobiol* 14: 51-60.

Williams SE, Mann F, Sakurai T, Erskine L, Wei S, Rossi DJ, Gale N, Holt CE, Mason CA, and Henkemeyer M (2003). Ephrin-B2 and EphB1 mediate retinal axon divergence at the optic chiasm. *Neuron* 39: 919-935. [Comment in *Neuron* 39: 885-8; F1000 reviewed]

OTHER PUBLICATIONS

Williams SE, Knoblich JA and Fuchs E (2013). Spindle orientation-dependent and independent mechanisms promote epithelial stratification, [in preparation].

Williams SE and Fuchs E (2013). Signaling pathways regulating asymmetric cell division and differentiation. *Curr Opin Cell Biol* [in preparation].

Ezratty E, Stokes N, Chai S, Shah A, **Williams SE** and Fuchs E (2011). A role for the primary cilium in Notch signaling and epidermal differentiation during skin development. *Cell* 145: 1129-41. [F1000 reviewed]

- Luxenburg C, Pasolli HA, **Williams SE** and Fuchs E (2011). Developmental roles for Srf, cortical cytoskeleton and cell shape in epidermal spindle orientation. *Nat Cell Biol* 13: 203-14. [F1000 reviewed]
- Perez-Moreno M, Song W, Pasolli HA, **Williams SE** and Fuchs E (2008). Loss of p120 catenin and links to mitotic alterations, inflammation and skin cancer. *PNAS* 105: 15399-404. [F1000 reviewed]
- Petros T, **Williams SE**, and Mason CA (2006). Temporal regulation of EphA4 in astroglia during murine retinal and optic nerve development. *Mol Cell Neurosci* 32: 49-66.
- Herrera E, Marcus R, Li S, **Williams SE**, Erskine L, Lai E, and Mason CA (2004). Foxd1/BF-2 is required for proper formation of the optic chiasm. *Development* 131: 5727-39.
- Menzies AS, Aszodi A, **Williams SE**, Pfeifer A, Wehmen AM, Goh KL, Mason CA, Fassler R, and Gertler FB (2004). Mena and VASP are required for multiple actin-dependent processes that shape the vertebrate nervous system. *JNeurosci* 24: 8029-38.
- Erskine L, **Williams SE**, Brose K, Kidd T, Rachel RA, Goodman CS, Tessier-Lavigne M, and Mason CA (2000). Retinal ganglion cell axon guidance in the mouse optic chiasm: expression and function of Robos and Slits. *JNeurosci* 20: 4975-82.
- Li RH, **Williams SE**, White M, and Rein DR (1999). Dose control with cell lines used for encapsulated cell therapy. *Tissue Engineering* 5: 453-66.
- Li RH, White M, **Williams SE**, and Hazlett T (1998). Poly(vinyl alcohol) synthetic polymer foams as scaffolds for cell encapsulation. *J Biomaterials Sci: Polymer Ed* 9: 239-58.

CONFERENCE TALKS AND INVITED LECTURES

- "Asymmetric cell divisions promote Notch-dependent epidermal differentiation," **S. Williams**, S. Beronja and E. Fuchs. International Society for Stem Cell Research Conference, Toronto, ON, Canada, June 15-18th, 2011.
- "LGN, NuMA, and Dctn1 regulate asymmetric cell divisions and promote Notch-dependent epidermal differentiation," **S. Williams**, S. Beronja and E. Fuchs. Cell Cycle, Cancer and Development Conference, Saint-Malo, France, May 25-28th, 2011.
- "Role of asymmetric cell divisions in mammalian epidermal development," **S. Williams**, S. Beronja, A. Pasolli and E. Fuchs. 5th Annual Rockefeller University Postdoctoral Retreat, Skytop Lodge, PA, Aug. 4-5th, 2010.
- "Ephrin-B2 is a candidate signal for divergence of retinal axons at the mouse optic chiasm," **S. Williams**, L. Erskine, T. Sakurai, G. Yancopoulos, N. Gale and C. Mason. Society for Neuroscience Conference, San Diego, Nov. 10-15th, 2001.

POSTER PRESENTATIONS

- "LGN, NuMA and Dctn1 regulate asymmetric cell divisions and promote Notch-dependent epidermal differentiation," **S. Williams**, S. Beronja and E. Fuchs. Developmental Biology Gordon Research Conference, Andover, NH, June 19-24th, 2011.
- "EphB1 directs the ipsilateral projection and establishes binocular vision," **S. Williams**, E. Herrera, M. Henkemeyer and C. Mason. Society for Neuroscience Conference, New Orleans, Nov. 8-13th, 2003.
- "Ephrin-B2 controls divergence of retinal axons at the mouse optic chiasm," **S. Williams**, L. Erskine, T. Sakurai, G. Yancopoulos, N. Gale and C. Mason. Visual System Development Gordon Research Conference, Newport, RI, June 9-14th, 2002.

“Ephrin-B2 directs divergence of retinal axons at the mouse optic chiasm,” S. Williams, L. Erskine, T. Sakurai, N. Gale and C. Mason. Axon Guidance & Neural Plasticity Meeting, Cold Spring Harbor, Sept. 25-29th, 2002.

FELLOWSHIPS AND AWARDS

ATIP-Avenir young investigator grant awardee CNRS/INSERM (French government) “Understanding how asymmetric cell divisions regulate stem cell biology and epithelial differentiation”	2012
Poster prize winner Cell Cycle, Cancer, and Development Conference European Association for Cancer Research	2011
American Cancer Society postdoctoral fellowship American Cancer Society PF-07-045-01-DDC “Role of Asymmetric Cell Divisions in Epidermal Development and Homeostasis”	2007-2010
National Institutes of Health training grant National Cancer Institute 5T32 CA009673 “Mechanisms of Cell Regulation and Transformation”	2007
National Institutes of Health training grant National Eye Institute 5T32 EY013933 “Vision Sciences Training Grant”	2001-2004
National Institutes of Health training grant National Institute of Mental Health 5T32 MH015174 “Neurobiology and Behavior Research Training Program”	1999-2001
Dean’s Scholarship Columbia University Graduate School of Arts and Sciences	1998-1999
Sigma Xi Scientific Research Society	1995
National Merit Scholarship finalist and awardee	1992