

Nicklaus A. Sparrow, PhD

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Professional Summary

PhD molecular cell biologist with biomedical research experience focused on neurobiology, nervous system development, neuro-oncology, and translational neuroscience. Former Cedars-Sinai laboratory manager/research associate responsible for establishing a translational neurology laboratory, supporting grant and manuscript production, managing staff, and maintaining compliance, inventory, equipment, and large datasets. Technical expertise includes extensive histology, immunofluorescence/immunohistochemistry, cryosectioning, tissue clearing, light-sheet/confocal/widefield microscopy, 3D tissue analysis, live-cell imaging. Additional experience includes rodent husbandry, genotyping, survival surgery, behavioral testing, and dissection; primary rodent and human nervous system cultures; work with multiple immortalized cell lines; plasmid construction and transfection; PCR; extensive western blotting including immunoprecipitation. Author of 14 primary publications and presenter at national and international conferences, including the Gordon Research Conference on Myelination.

Education

Ph.D., Biomedical Sciences, 2011-2017, University of Central Florida, Orlando, FL; GPA: 3.84

- Dissertation: *The Actin-Severing Protein Cofilin Is Downstream Of Neuregulin Signaling, Is Regulated By The Tumor Suppressor Merlin, And Is Essential For Schwann Cell Myelination*

B.S., Molecular Biology & Microbiology and B.S., Biotechnology, 2005-2010, University of Central Florida, Orlando, FL; Cumulative GPA: 3.56, Major GPA: 3.65

- Member of the Burnett Honors College
- Honors in the Major (HIM), Undergraduate Research Thesis
- Student-Mentor Academic Research Team (SMART) program

Professional Experience

Laboratory Manager/Research Associate III, July 2019–July 2023, Cedars-Sinai Medical Center, Laboratory of Shouri Lahiri, MD

- Established, organized, operated, and maintained compliance for a translational neuroscience laboratory.
- Managed up to 5 laboratory staff, from undergraduates to senior scientists.
- Established SOPs for two animal models (ARDS and UTI), maintained and genotyped five transgenic mouse lines, and wrote and maintained multiple IACUC protocols.
- Conducted multiple short- and long-term survival surgeries, including routine IP/IV/SC injections of antibodies/peptides/small molecules, on mice and rats with pre- and postsurgical behavioral testing, and post-behavioral tissue isolation/preparation for genetic, transcriptomic, proteomic, and histological analyses.
- Performed *in vitro* assays where primary neurons were treated with various exogenous peptides and small molecules, and subsequently analyzed by western blotting.
- Optimized numerous immunohistochemical assays for reproducibility in brain and nervous system tissue sections, as well as kidney, bladder, and lung sections.
- Operated and maintained a Zeiss Imager Z.2 with Apotome 2.0 for the Neurosciences Department and trained new personnel.

Postdoctoral Fellow Scientist, October 2017–July 2019, Cedars-Sinai Medical Center, Laboratory of Dr. Warren G. Tourtellotte, MD

- Performed whole-mount staining of embryos and adult organs, tissue clearing (iDISCO), and light-sheet microscopy (LaVisionBioTec UltraMicroscope) and 3D image analysis (Imaris).
- Managed mouse husbandry, standardized PCR genotyping of 7 alleles, timed-pregnant female production, gross and fine dissection of postnatal and adult tissues, and tissue processing for fluorescent and dye-based histology (cryosections and FFPE).
- Maintained and operated the tissue culture room; cultured primary neurons and cell lines.
- Performed plasmid synthesis, cell-line transfection/recombinant protein expression, protein extraction and quantification, immunoprecipitation, and western blotting.
- Operated and maintained a Zeiss Imager Z.2 with Apotome 2.0 for the Neurosciences Department.

Undergraduate/Graduate Research Assistant, January 2007–August 2016, University of Central Florida, Laboratory of Dr. Cristina Fernandez-Valle, PhD

- Pioneered methods for the purification and cell culture of human schwannoma cells derived from fresh patient samples.

- Developed a high-throughput growth/imaging technique to analyze myelinating Schwann cell/neuron co-cultures in a 96-well format.
- Managed husbandry and breeding of 4 mouse colonies, including routine PCR genotyping.
- Assisted in the development of an immortalized, merlin-null mouse cell line to model Neurofibromatosis Type II.
- Dissected mice and rats to isolate Schwann cells and neurons for cell culture, routinely supplying cells to 5 coworkers.
- Performed long-term live imaging using a Zeiss widefield system on primary nervous system tissues and multiple cancer cell lines transfected with plasmids or treated with small molecules.
- Operated and maintained a Zeiss LSM 710 confocal microscope system for the Biomedical Department.

Technical Skills

Laboratory: cryosectioning and tissue mounting; immunofluorescence and immunohistochemistry; dye-based histology; whole-mount staining/clearing (iDISCO); mouse husbandry; rodent and human tissue preparation for culture/histology; primary cell culture; immortalized cell-line culture; crystal violet proliferation assays; protein and DNA extraction; western blotting; immunoprecipitation; PCR; plasmid preparation/purification; transient chemically mediated transfection; stable viral vector-mediated transfection; immortalized cell-line production.

Microscopy and imaging: fluorescence/transmitted-light widefield microscopy; confocal microscopy; spinning-disk microscopy; long-term live-cell microscopy; light-sheet microscopy; 2D and 3D tissue imaging and analysis.

Laboratory operations: laboratory establishment and organization; SOP development; staff training; inventory and reagent management; equipment operation, maintenance, and troubleshooting; compliance support; large dataset organization and preservation.

Software: Imaris; Zeiss LSM 510; Zeiss Zen Black and Blue; Zeiss AxioVision; PerkinElmer Volocity; ImageJ/FIJI; GraphPad Prism; JMP Pro; ImageQuant TL (LI-COR); Microsoft Office; Adobe Photoshop/InDesign/Illustrator; CorelDRAW.

Publications

17 β -estradiol ameliorates delirium-like phenotypes in a murine model of urinary tract infection. Guidry G, Sparrow NA, Marshall HS, De Souza Santos R, Bharath SP, Gezalian MM, Pisarska MD, Vit JP, Kelly SA, Karumanchi SA, Lahiri S. *Sci Rep*. 2022 Nov 15;12(1):19622. doi: [10.1038/s41598-022-24247-w](https://doi.org/10.1038/s41598-022-24247-w).

Prone positioning reduces frontal and hippocampal neuronal dysfunction in a murine model of ventilator-induced lung injury. Sparrow NA, Guidry G, Anwar F, Darwish S, Kelly SA, Karumanchi SA, Lahiri S. *Front Med (Lausanne)*. 2022 Nov 4;9:987202. doi: [10.3389/fmed.2022.987202](https://doi.org/10.3389/fmed.2022.987202).

Systemic interleukin-6 inhibition ameliorates acute neuropsychiatric phenotypes in a murine model of acute lung injury. Anwar F, Sparrow NA, Rashid MH, Guidry G, Gezalian MM, Ley EJ, Koronyo-Hamaoui M, Danovitch I, Ely EW, Karumanchi SA, Lahiri S. *Crit Care*. 2022 Sep 13;26(1):274. doi: [10.1186/s13054-022-04159-x](https://doi.org/10.1186/s13054-022-04159-x).

Interleukin-6 mediates delirium-like phenotypes in a murine model of urinary tract infection. Rashid MH, Sparrow NA, Anwar F, Guidry G, Covarrubias AE, Pang H, Bogguri C, Karumanchi SA, Lahiri S. *J Neuroinflammation*. 2021 Oct 28;18(1):247. doi: [10.1186/s12974-021-02304-x](https://doi.org/10.1186/s12974-021-02304-x).

Interleukin-6 Inhibition Reduces Neuronal Injury in a Murine Model of Ventilator-induced Lung Injury. Sparrow NA, Anwar F, Covarrubias AE, Rajput PS, Rashid MH, Nisson PL, Gezalian MM, Toossi S, Ayodele MO, Karumanchi SA, Ely EW, Lahiri S. *Am J Respir Cell Mol Biol*. 2021 Oct;65(4):403-412. doi: [10.1165/rcmb.2021-0072OC](https://doi.org/10.1165/rcmb.2021-0072OC).

Cerebrovascular and neurological perspectives on adrenoceptor and calcium channel modulating pharmacotherapies. Gezalian MM, Mangiacotti L, Rajput P, Sparrow N, Schlick K, Lahiri S. *J Cereb Blood Flow Metab*. 2021 Apr;41(4):693-706. doi: [10.1177/0271678X20972869](https://doi.org/10.1177/0271678X20972869). Epub 2020 Nov 19.

Peroxynitrite supports a metabolic reprogramming in merlin-deficient Schwann cells and promotes cell survival. Pestoni JC, Klingeman Plati S, Valdivia Camacho OD, Fuse MA, Onatunde M, Sparrow NA, Karajannis MA, Fernández-Valle C, Franco MC. *J Biol Chem*. 2019;294(30):11354-11368. doi: [10.1074/jbc.RA118.007152](https://doi.org/10.1074/jbc.RA118.007152).

A chemical biology approach identified PI3K as a potential therapeutic target for neurofibromatosis type 2. Petrilli AM, Fuse MA, Donnan MS, Bott M, Sparrow NA, Tondera D, Huffziger J, Frenzel C, Malany CS, Echeverri CJ, Smith L, Fernández-Valle C. *Am J Transl Res*. 2014 Oct 11;6(5):471-93. PMID: [PMC4212923](https://pubmed.ncbi.nlm.nih.gov/24212923/).

The CT20 peptide causes detachment and death of metastatic breast cancer cells by promoting mitochondrial aggregation and cytoskeletal disruption. Lee MW, Bassiouni R, Sparrow NA, Iketani A, Boohaker RJ, Moskowitz C, Vishnubhotla P, Khaled AS, Oyer J, Copik A, Fernandez-Valle C, Perez JM, Khaled AR. *Cell Death Dis*. 2014 May 22;5:e1249. doi: [10.1038/cddis.2014.225](https://doi.org/10.1038/cddis.2014.225).

Measuring anisotropic cell motility on curved substrates. Douglass KM, Sparrow NA, Bott M, Fernandez-Valle C, Dogariu A. *J Biophotonics*. 2013 May;6(5):387-92. doi: [10.1002/jbio.201200089](https://doi.org/10.1002/jbio.201200089).

Nitration of Hsp90 induces cell death. Franco MC, Ye Y, Refakis CA, Feldman JL, Stokes AL, Basso M, Melero Fernández de Mera RM, Sparrow NA, Calingasan NY, Kiaei M, Rhoads TW, Ma TC, Grumet M, Barnes S, Beal MF, Beckman JS, Mehl R, Estévez AG. *Proc Natl Acad Sci USA*. 2013 Mar 19;110(12):E1102-11. Epub 2013 Mar 4. doi: [10.1073/pnas.1215177110](https://doi.org/10.1073/pnas.1215177110).

Stability of the tumor suppressor merlin depends on its ability to bind paxillin LD3 and associate with β 1 integrin and actin at the plasma membrane. Manetti ME, Geden S, Bott M, Sparrow N, Lambert S, Fernandez-Valle C. *Biol Open*. 2012 Oct 15;1(10):949-57. doi: [10.1242/bio.20122121](https://doi.org/10.1242/bio.20122121).

The actin-severing protein cofilin is downstream of neuregulin signaling and is essential for Schwann cell myelination. Sparrow N, Manetti ME, Bott M, Fabianac T, Petrilli A, Bates ML, Bunge MB, Lambert S, Fernandez-Valle C. *J Neurosci*. 2012 Apr 11;32(15):5284-97. doi: [10.1523/JNEUROSCI.6207-11.2012](https://doi.org/10.1523/JNEUROSCI.6207-11.2012).

Schwannomin/merlin promotes Schwann cell elongation and influences myelin segment length. Thaxton C, Bott M, Walker B, Sparrow NA, Lambert S, Fernandez-Valle C. Mol Cell Neurosci. 2011 May;47(1):1-9. doi: [10.1016/j.mcn.2010.12.006](https://doi.org/10.1016/j.mcn.2010.12.006).

Presentations

- **NF Conference, Children's Tumor Foundation**, 2015, Monterey, CA; "Merlin is Essential for Schwann Cell Myelination."
- **Gordon Research Conference: Myelin, Gordon Research Conferences**, 2012, Lucca, Italy; "The Actin-Severing Protein Cofilin is Downstream of Neuregulin Signaling and is Essential for Schwann Cell Myelination."
- **Graduate Research Forum, University of Central Florida**, 2012, Orlando, FL; "The Actin Severing Protein Cofilin is Essential for Schwann Cell Myelination."
- **Graduate Biomedical Sciences Research Colloquium, University of Central Florida**, 2011, Orlando, FL; "The Actin Severing Protein Cofilin is Essential for Schwann Cell Myelination."
- **American Society for Cell Biology 49th Annual Meeting**, 2009, San Diego, CA; "Merlin Regulates Schwann Cell Morphology Through the LIMK-Cofilin Pathway in an in vitro Model of Neurofibromatosis Type II."
- **Graduate Biomedical Sciences Research Colloquium, University of Central Florida**, 2009, Orlando, FL; "Acute Changes in Protein Expression and Phosphorylation Following Loss of Merlin in an in vitro Model of Neurofibromatosis Type II."
- **Showcase of Undergraduate Research and Excellence, University of Central Florida**, 2009, Orlando, FL; "Acute Changes in Protein Expression and Phosphorylation Following Loss of Merlin in an in vitro Model of Neurofibromatosis Type II."
- **Showcase of Undergraduate Research and Excellence, University of Central Florida**, 2008, Orlando, FL; "Are ErbB Receptors Drug Targets for Malignant Peripheral Nerve Sheath Tumors?"

Grants, Awards, and Honors

- **Research Excellence Fellowship**, August 2014-May 2016, Burnett School of Biomedical Sciences, College of Medicine, University of Central Florida, \$2,000.
- **Graduate Travel Award**, 2012, College of Graduate Studies, University of Central Florida, \$650.
- **Conference Registration & Travel Allocation**, 2012, Student Government Association, University of Central Florida, \$250.
- **Travel Award**, 2009, American Society for Cell Biology (ASCB), \$300.
- **Honors in the Major Grant**, 2008, Burnett Honors College of University of Central Florida, \$1,000.
- **SMART Grant**, 2008, Burnett Honors College of University of Central Florida, \$2,000.
- **Research Fellowship**, 2007-2010, Office of Research and Commercialization of University of Central Florida, ~\$6,500 annually.
- **Pegasus Achievement Award**, 2005, University of Central Florida, \$7,600 over four years.
- **Florida Academic Scholar**, 2005, Florida Bright Futures Scholarship Program, ~\$3,050 annually.
- **Dean's List**, University of Central Florida: Fall 2005, Spring 2006, Fall 2006, Spring 2007, Spring 2008.

Special Training

- Advanced Confocal Techniques, Zeiss US Headquarters, Thornwood, NY, June 2011.
- Training on IACUC and AAALAC international regulations, taught by Dr. Christopher Parkinson and Dr. Norman Guilloud, completed annually, 2011-2017.
- Training on Aseptic Surgery Techniques at UCF Lake Nona Campus, taught by Dr. Norman Guilloud, April 7, 2011.
- Training on Euthanasia at UCF Lake Nona Campus, presented by Dr. Norman Guilloud, January 2011.
- Training on Ethics, the three R's, animal use and awareness, and zoonosis, taught by Dr. Norman Guilloud, October 19, 2010.
- Training in necropsy technique by Caroline Thompson, February 2010.
- Courses on Laboratory Animal Health and Welfare and Common Problems in Laboratory Animals, taught by Norman Guilloud, DVM, 2007.
- Proper use of anesthetic vaporizers and tail snip collection by Caroline Thompson, 2007.
- Training on postmortem dissection and tissue collection from mice and rats by Dr. Fernandez-Valle, 2007.