

Cecil James “Jake” Saunders, PhD

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A scientist with substantial domain knowledge ranging from chemistry to biology, technical expertise in molecular biology, microscopy, physiology, statistics, and data analysis, and a talent for communicating complex ideas using compelling visuals and the written word.

Education

University of Colorado, Anschutz Medical Campus
PhD Neuroscience, 2014

Wake Forest University, Winston-Salem, NC
MS Biology, 2008

Lenoir-Rhyne University, Hickory, NC
BS, Biology, BA, Chemistry and Philosophy, 2005
cum laude, Biology Program Honors

Certifications

Data Science Specialization 2016 – current, Johns Hopkins University through Coursera
Advanced Sequencing Technologies & Applications 2015, Cold Spring Harbor Laboratory

Technical Skills

Computer skills: Microsoft Office Suite, Adobe Creative Suite, ImageJ, R Programming, Bioconductor, Python, Web design, Visual Basic, Matlab, SPSS, Graphpad Prism

Laboratory Skills: *Microscopy* (Histology, Immunofluorescence, Immunohistochemistry, epifluorescence microscopy, laser scanning confocal microscopy, spinning disk confocal microscopy, Calcium imaging, post-acquisition image processing), *Cell Culture*, *Molecular Biology* (PCR, Reverse transcription, SYBR Green PCR, Taqman PCR, single cell collection, single cell RNA amplification), *respiratory physiology and plethysmography, soldering and circuit construction*

Professional Experience

Research Assistant Professor, 2017–current
Department of Biology

Wake Forest University, Winston-Salem, NC

- Designed and conducted behavioral, genomic and physiological experiments in several invertebrate model systems.
- Managed and coordinated a dozen highly motivated undergraduate researchers on independent projects.

Postdoctoral Research Fellow, 2014–current

Department of Otorhinolaryngology – Head and Neck Surgery

University of Pennsylvania, Philadelphia, PA

- Spearheaded single cell RNA-sequencing by initiating numerous collaborations to develop entire workflow from wet lab to informatics
- Organized and analyzed data sets from large to small, and designed graphics effectively describing those data sets for publications and presentations.
- Designed and conducted experiments to assess the expression of taste receptors and related genes in human airway tissue and cultured cells using a variety of methods.
- Trained medical students in laboratory techniques, statistics and scientific writing.
- Directed rotating medical students in conducting publication-quality research.
- Conducted and optimized single cell collection and single cell RNA amplification.
- Wrote and edited a variety of grants and scientific manuscripts in a team environment.
- Designed publication quality graphics

Graduate Research Assistant, 2008–2014

Department Cell & Developmental Biology

University Colorado Medical Campus, Aurora, CO

- Created award winning visuals—posters, diagrams and micrographs— and peer reviewed scientific manuscripts to communicate scientific ideas effectively to scientists and non-scientists.
- Acquired training in the appropriate use of specialized software for image and statistical analysis.
- Trained team members in the use of specialize software for image and statistical analysis
- Designed and conducted molecular, anatomic and microscopy experiments to determine cell division, cell death and the transduction of inflammatory signals.
- Optimized immunofluorescence and imaging protocols.
- Researched and communicated complex scientific ideas in publications and presentations.

Graduate Research and Teaching Assistant, 2006–2008

Department of Biology

Wake Forest University, Winston-Salem, NC

- Developed presentations, speeches and handouts to clearly communicate scientific information to individuals and groups of up to 40 people.
- Proofread and provided detailed editorial feedback on over 1000 pages of lab reports each semester.
- Managed groups of undergraduate researchers in conducting publication quality research.
- Constructed and programmed custom computer controlled physiological equipment to automate the administration of stimulus and the acquisition of data.
- Trained undergraduates in experimental design, preference testing and statistics.

Laboratory Technician, 2005–2006

Specialty Polymers Inc.

Chester, SC

- Communicated and coordinated with production staff, management and consultants to maintain accurate knowledge of current state of product supply chain.
- Analyzed scientific data on product inventory and wrote reports to efficiently communicate this information to management.
- Conducted physical and chemical assays on emulsion polymers to ensure they met production specifications.

Laboratory Assistant, Supplemental Instructor and Tutor, 2002-2005

Biology Department and Tutor Services

Lenoir-Rhyne University, Hickory, NC

- Led and planned tutoring session for individuals and groups of up to 25 in a variety of collegiate and secondary science courses.
- Conducted and planned demonstrations and presentations that effectively communicated scientific ideas.
- Assisted professors during laboratories for Concepts of Biology, Cell Biology, and Anatomy and Physiology I & II.
- Responsibilities included setting up for laboratories, cleaning up, grading tests and answering student questions.
- Provided supplemental instruction for Fundamentals of General Chemistry, Organic Chemistry I & II, and Ethics.

Web design and Technical Support, 2001–2005

Morganton, NC

- Designed websites and provided IT expertise to local businesses on a contract basis.

Teaching
Experience

Guest Lecturer September 22, 2015. “Immunofluorescence, Immunohistochemistry and Digital Imaging.”

BIO 235 Histology, Southern Connecticut State University.

Teaching Skills and Instructional Development Course 2008, Wake Forest University

Laboratory Instructor 2006–2008, Wake Forest University: Comparative Physiology, Cell Biology

Teaching Assistant 2002–2005, Lenoir-Rhyne College: Anatomy and Physiology I & II

Supplemental Instructor 2003–2005, Lenoir-Rhyne College: Organic Chemistry I & II

Tutor 2002–2004, Lenoir-Rhyne College: Fundamentals of General Chemistry, Ethics

	<p>Tutor 2000–2004, freelance, high school chemistry, biology, physics and AP biology</p> <p>Mentoring, Extensive experience mentoring undergraduate researchers, medical students, residents and fellows in a laboratory setting</p>
<p>Honors & Awards</p>	<p>Cover Image April 22, 2014, PNAS, www.pnas.org/content/111/16.cover-expansion</p> <p>Best Poster 2013, Front Range Neuroscience Group Annual Meeting</p> <p>Cover Image August 2013, American Journal of Respiratory Cell and Molecular Biology, www.atsjournals.org/action/showLargeCover?issue=40128700</p> <p>Nominated for Best Paper 2013, American Journal of Respiratory Cell and Molecular Biology</p> <p>Best Poster 2012, Rocky Mountain Regional Neuroscience Group Annual Meeting</p> <p>Don Tucker Memorial Award 2012, Outstanding Graduate Student Presentation, AChemS XXXIV</p> <p>Best Poster 2011, Neuroscience Program Annual Retreat, University of Colorado, Anschutz Med Campus</p> <p>Alumni Travel Award 2008, Wake Forest University, Graduate School of Arts and Sciences</p> <p>Elton C. Cocke Travel Award 2008, Wake Forest University, Biology Department</p> <p>Travel Award 2007, Association for Chemoreception Sciences</p> <p>Derieux Award for Excellence in Undergraduate Research 2004, NC Academy of Science</p> <p>Yarbrough Undergraduate Research Grant 2003, NC Academy of Science</p> <p>Best Bill in Senate 2002, North Carolina Student Legislature 65th Annual Session</p>
<p>Service & Activities</p>	<p>Postdoctoral Editors Association, University of Pennsylvania, 2016–current</p> <p>Data Science Philadelphia, 2015–current</p> <p>Philadelphia Python Users Group, 2015–current</p> <p>Biomedical Science Policy Group, University of Pennsylvania, 2015–current</p> <p>Association for Chemoreception Sciences, 2006–2015</p> <p>American Thoracic Society, 2011–2013</p> <p>Society for Neuroscience, 2013–2014</p> <p>Seminar Committee, Neuroscience Program, University of Colorado, Student Representative 2012–2014</p> <p>Aurora Lights Program, Volunteer 2010–2012</p> <p>Brain Awareness Council, Wake Forest University, 2007 – 2008</p> <p>North Carolina Student Legislature, 2001 – 2005</p> <p>Ad hoc reviewer: American Journal of Respiratory Cell and Molecular Biology, Cellular and Molecular Life Sciences, Laryngoscope, Pathology-Research and Practice</p>
<p>Peer Reviewed Publications</p>	<p>W Kennedy†, A Ghosh†, CJ Saunders, NA Cohen, NA Mirza. 2016. Progression of Inflammatory Gene Expression in a Murine Model of Subglottic Stenosis. Otolaryngology-Head and Neck Surgery [In Review].</p> <p>AD Workman†, CJ Saunders, B Chen, R Carey, RJ Lee, JK Foskett, MG Tordoff, NA Cohen. CALHM1-Mediated ATP Release and CBF Modulation in Airway Epithelial Cells. FASEB. [In Review].</p> <p>JE Douglas†, CJ Saunders, DR Reed, NA Cohen. A role for airway taste receptor modulation in the treatment of upper respiratory infections. Expert Review of Respiratory Medicine. 2016. 10(2): 157-170.</p> <p>EA Nicoll†, A Ghosh†, S Haft†, R Frank, CJ Saunders, NA Cohen, N Mirza. IL-1 Receptor Antagonist inhibits early granulation formation. Ann Otol Rhinol Laryngol. 2016. 125(4):284-9.</p> <p>CJ Saunders, Michael Christensen, TE Finger, M Tizzano. 2014. Cholinergic Neurotransmission Links Solitary Chemosensory Cells to Nasal Inflammation. Proc Natl Acad Sci USA. 2014. 111(16):6075–6080.</p> <p>CJ Saunders, SD Reynolds, TE Finger. Chemosensory Brush Cells of the Trachea: A Stable Population in a Dynamic Epithelium. Am J Respir Cell Mol Biol. 2013. 49(2):190–196.</p> <p>CJ Saunders, Li WY†, Patel TD†, JA Muday, WL Silver. 2013. Dissecting the role of TRPV1 in detecting multiple trigeminal irritants in three behavioral assays for sensory irritation. F1000Research. 2013. 2:74.</p>
<p>Book Chapters</p>	<p>CJ Saunders & WL Silver. "Anatomy and Physiology of Chemesthesis" In Chemesthesis: The Sensations of Eating — Hot, Cold, Tingling and Numbing and How to Use Them in Food. Editor Shane McDonald, David Bolliet & John Hayes. Wiley. 2016. p77-91.</p> <p>R Ostrow†, TMD Ruel†, TB Voigt†, CJ Saunders, RM Hallock. "Evolution of TRP channels as mediators of pheromone signaling." In Animal Communication and Cognition: Principles, Evolution and Development. Editor Tabitha Wagner. Nova. 2015.</p>
<p>† student trainees</p>	

† *student trainees*

- CJ Saunders.** "Trigeminal Nerve" In *The Brain, Nervous System, and Its Diseases: An Encyclopedia of Neuroscience and Neurology*. Editor Jennifer Hellier. ABC-CLIO. 2014.
- CJ Saunders & Jennifer Hellier.** "Cranial Nerves" In *The Brain, Nervous System, and Its Diseases: An Encyclopedia of Neuroscience and Neurology*. Editor Jennifer Hellier. ABC-CLIO. 2014.
- WL Silver, P Roe & **CJ Saunders.** *Functional Neuroanatomy of the Upper Airway in Experimental Animals. In Toxicology of the Nose and Upper Airways*. Editors JB Morris & DJ Shusterman. New York: Informa Healthcare. 2010. p45-64.

Selected
Presentations

- WL Silver & **CJ Saunders.** Nasal trigeminal chemoreception: From free nerve endings to epithelial chemosensors. International Symposium on Olfaction and Taste XVII, June 8, 2016.
- CJ Saunders.** Solitary Chemosensory Cells and the Revenge of the Common Chemical Sense! Southern Connecticut State University, Department of Biology Seminar Series, New Haven, Connecticut. September 22, 2015.
- CJ Saunders.** Immunofluorescence and Immunohistochemistry. Southern Connecticut State University, Histology Guest Lecturer, New Haven, Connecticut. September 22, 2015.
- CJ Saunders.** Solitary Chemosensory Cells and the Revenge of the Common Chemical Sense! Monell Chemical Senses Center Seminar Series, Philadelphia, PA, September 16, 2014.
- CJ Saunders,** M Christensen, TE Finger, M Tizzano. Cholinergic Neurotransmission Links Nasal Solitary Chemosensory Cells to the Immune System. [Poster] Society for Neuroscience. November, 12, 2013.
- CJ Saunders,** TE Finger, M Tizzano. Cholinergic Neurotransmission Links Solitary Chemosensory Cells To Nasal Inflammation. [Poster] Association for Chemoreception Sciences XXXV, April 19, 2013.
- CJ Saunders,** Susan D Reynolds & Thomas E Finger. Chemosensory Brush Cells of the Trachea: Turnover, Proliferation and Regeneration. [Poster] Association for Chemoreception Sciences XXXIV, April 26, 2012.
- CJ Saunders,** Susan D Reynolds & Thomas E Finger. Solitary Chemosensory Cell Turnover in Tracheal Epithelium, in vivo and in vitro models. [Poster] American Thoracic Society, May 13, 2011.
- CJ Saunders,** Susan D Reynolds & Thomas E Finger. Solitary Chemosensory Cell Turnover in Tracheal Epithelium, in vivo and in vitro models. [Poster] Association for Chemoreception Sciences XXXIII, April 14, 2011.
- CJ Saunders,** Susan D Reynolds & Thomas E Finger. Growth and Differentiation of Solitary Chemosensory Cells in Tracheal Epithelial Culture. [Poster] Association for Chemoreception Sciences XXXII meeting, April 22, 2010.
- CJ Saunders,** W Li, T Patel, B Xiang & WL Silver. Responses of TRPV1 Knockout Mice to Trigeminal Irritants in Two Different Behavioral Assays. [Poster] Association for Chemoreception Sciences XXXI, April 23, 2009.
- CJ Saunders & WL Silver.** The respiratory response of TRPV1 Knockout mice to trigeminal irritants. [Poster] International Symposium on Olfaction and Taste XV, July 24, 2008.
- CJ Saunders & J Bisbee.** The teratogenic effect of alcohol on the neurological development of *Mus musculus*. 101st meeting of the North Carolina Academy of Science, March 27, 2004.

Interests

Digital Photography, Science and Technology Podcasts, Classic Science Fiction Novels, Comparative Literature and Cinema