

Candice Elaine Paulsen

Curriculum Vitae

Department of Molecular Biophysics & Biochemistry
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Degrees

2011 Ph.D., Chemical Biology; University of Michigan, Ann Arbor, MI
Thesis Advisor: Dr. Kate Carroll

2006 B.S., Genetic Biology; Purdue University, West Lafayette, IN

Employment

2018- Assistant Professor of Molecular Biophysics & Biochemistry, Yale University
2012-2017 Post-doctoral fellow with Dr. David Julius, University of California, San Francisco
2011-2012 Post-doctoral fellow with Dr. Kate Carroll, The Scripps Research Institute, Jupiter, Florida

Honors

2018-2021 Rita Allen Foundation and the American Pain Society Award in Pain Scholar
2018-2019 International Association for the Study of Pain Early Career Research Grant
2014-2017 Howard Hughes Medical Institute Fellow of the Helen Hay Whitney Foundation
2012-2013 NIH Cardiovascular Research Institute T-32 Postdoctoral Fellow
2009-2010 NIH Chemistry-Biology Interface T-32 Pre-Doctoral Fellow

Other Professional Activities

Undergraduate Research Students Supervised

Schaefer, Samantha	2018
Conte Cortez Martins, Gabriel	2018-2020
Elrazky, Sami	2019
Kushmeliuk, Severyn	2018-present
Zhang, Alice	2020-present
Montes, Kyra	2020-present

Post-Graduate Students Supervised

Schaefer, Samantha	2019-present
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Graduate Students Supervised

Truong, Thu	2005-2012 (<i>Carroll lab</i>)
Gao, Yuan	2013-2017 (<i>Julius lab</i>)

Lin King, John	2014-2017 (<i>Julius lab</i>)
Sanders, Justin	2018-present
Bali, Avnika	2019-present

Teaching

Number of Lecture Credits shown in parentheses.

300a/600a	Undergraduate Principles of Biochemistry. 2018 (7), 2019 (8), 2020 (8).
730a	Method and Logic in Molecular Biology. 2018 (9), 2020 (8).
105a	Biology, the World, and Us. 2018 (1), 2019 (4), 2020 (4), 2021 (4)
105b	Biology, the World, and Us. 2020 (4).
676b	Responsible Conduct of Research. 2018 (1).

Service

Internal Service

- BQBS Graduate Admissions Committee (2018)
- MB&B Junior Faculty Search Committee (2018-2020)
- MB&B Diversity and Climate Committee (2020-2021)
- MB&B Undergraduate Advising (2019-2022)
- MB&B Web and Social Media Committee (Chair 2018-2019; Advisor 2019-2020)
- Prelim Exam Committees (4): Allison Butt (*Koelle lab*); Catharine Shipps (*Malvankar lab*); Katelyn Noronha (*Bindra lab*); Yoon Ki (Ed) Joo (*Kabeche lab*)
- Ph.D. Thesis Advisory Committees (1): Melissa Carrizales (*Koleske lab*)

External Service

- Member: Biophysical Society, International Association for the Study of Pain
- Editorial Board Member: *Frontiers in Pain Research*
- Reviewer: *Communications Biology*

Invited Presentations

2021

- “A TRPA1 natural variant confers channel hyperactivity by co-assembling with wild type subunits”. Invited Seminar Speaker. University of Kansas Medical Center. Kansas City, KS.

2019

- “Paulsen lab studies molecular mechanisms of pain”. Invited Speaker. Biophysical & Structural Biology Symposium. New Haven, CT.
- “Studying molecular mechanisms of pain in the Paulsen lab”. Invited Speaker. Rita Allen Retreat. Cold Spring Harbor, NY.
- “Studying molecular mechanisms of pain in the Paulsen lab”. Invited Speaker. American Pain Society National Meeting. Milwaukee, WI.

2018

- “Studying molecular mechanisms of pain in the Paulsen lab”. Invited Speaker. Yale Chemical Biology Retreat. West Haven, CT.

2017

- “Structure of the TRPA1 ion channel suggests regulatory mechanisms”. Invited Speaker. Oregon Health & Science University. Portland, OR.
- “Structure of the TRPA1 ion channel suggests regulatory mechanisms”. Invited Speaker. Fred Hutchinson Cancer Research Center. Seattle, WA.
- “Structure of the TRPA1 ion channel suggests regulatory mechanisms”. Invited Speaker. Yale University. New Haven, CT.
- “Structure of the TRPA1 ion channel suggests regulatory mechanisms”. Invited Speaker. California Institute of Technology. Pasadena, CA.
- “Structure of the TRPA1 ion channel suggests regulatory mechanisms”. Invited Speaker. University of Utah. Salt Lake City, UT.

2015

- “Activation and regulatory mechanisms: insights from structures of TRPV1 and TRPA1”. Invited Speaker. TRP Channel Symposium. Leuven, Belgium.

Research Contracts and Grants

Current

Award in Pain Scholar Paulsen (PI) 09/01/2018 – 08/31/2021

Rita Allen Foundation and American Pain Society

Title: Uncovering the regulation of TRPA1 by irritants, cofactors, and proteins.

The goal of this project is to determine how the pain receptor TRPA1 is regulated by small molecules and through protein-protein interactions.

Completed

Early Career Research Grant Paulsen (PI) 05/01/2018 – 04/30/2019

International Association for the Study of Pain

Title: Uncovering the regulation of TRPA1 by irritants, cofactors, and proteins.

The goal of this project was to optimize purification conditions for TRPA1 and to develop tagged TRPA1 variants for identification of interacting protein partners.

Publications

1. Zhao, J., Lin King, J.V., **Paulsen, C.E.**, Cheng, Y., Julius, D. "Mechanisms governing irritant-evoked activation and calcium modulation of TRPA1." *Nature*, 585: 141-145, **2020**.
2. van der Wijst, J., Leunissen, E.H., Blanchard, M.G., Venselaar, H., Verkaart, S., **Paulsen, C.E.**, Bindels, R.J., Hoenderop, J.G. "A gate hinge controls the epithelial calcium channel TRPV5," *Science Reports*, 7: 45489, **2017**.
3. Truong, T.H., Ung, P.M., Palde, P.B., **Paulsen, C.E.**, Sclessinger, A., Carroll, K.S. "Molecular basis for redox activation of epidermal growth factor receptor kinase," *Cell Chemical Biology*, 23: 837-848, **2016**.
4. **Paulsen, C. E.***, Armache, J.P.*, Gao, Y., Cheng, Y., Julius, D. "Structure of the human TRPA1 ion channel suggests regulatory mechanisms," *Nature*, 520: 511-517, **2015**.
(*contributed equally to this study)
5. **Paulsen, C.E.**, Carroll, K.S. "Cysteine-Based Redox Signaling: Chemistry, Biology, and Tools for Discovery," *Chemical Reviews* 113: 4633-4679, **2013**.
210 citations
6. **Paulsen, C.E.**, Truong, T.H., Garcia, F.J., Homann, A., Gupta, V., Leonard, S.E., Carroll, K.S. "Peroxide-dependent sulfenylation of the EGFR catalytic site enhances kinase activity," *Nature Chemical Biology*, 8: 57-64, **2012**.
7. **Paulsen, C.E.**, Carroll, K.S. "Orchestrating redox signaling networks through regulatory cysteine switches," *ACS Chemical Biology*, 5: 47-62, **2010**.
8. **Paulsen, C.E.**, Carroll, K.S. "Chemical dissection of an essential redox switch in yeast," *Chemistry & Biology*, 16: 217-225, **2009**.

Book Chapters

1. **Paulsen, C.E.** "Protocol 12.1: Preparation of amphipol-trapped membrane proteins for Cryo-EM studies". *Membrane proteins in aqueous solutions*, Springer, 2018.