

SONYA E. NEAL

seneal@ucsd.edu

Division of Biological Sciences
9500 Gilman Drive
4401 TATA Hall
La Jolla, CA 92093
(858) 822-1488

16532 Cimarron Crest Dr.
San Diego, CA 92127
(323) 303-4845

CURRENT POSITION

University of California, San Diego
Assistant Professor
Division of Biological Sciences

San Diego, CA
July 2018-present

PREVIOUS POSITION

University of California, San Diego
Postdoctoral Fellow
Advisor: Randolph Hampton

San Diego, CA
2013-2018

EDUCATION

University of California, Los Angeles
Ph.D. Molecular Biology
Dissertation: "Redox characterization of proteins involved in the mitochondrial intermembrane import pathway."
Advisor: Carla Koehler

Los Angeles, CA
2013

University of California, San Diego
BS, Warren Provost Honor, Chemistry and Biochemistry

San Diego, CA
2007

GRANTS AND AWARDS

NSF CAREER Award 2021-present

Pew Biomedical award 2020-present

R35 MIRA Award 2019-present
National Institute of General Medical Science, National Institutes of Health

FOCUS SRP Award 2019-2020
NHBLI, National Institutes of Health

Ruth L. Kirschstein Post-Doctoral National Research Service Award 2014-2017
National Institute of General Medical Science, National Institutes of Health

Chancellor's Post-Doctoral Academic Diversity Award 2014
University of California, San Diego

Ruth L. Kirschstein Pre-Doctoral National Research Service Award 2008-2013
National Institute of General Medical Science, National Institutes of Health

Eugene V. Cota Robles Fellowship 2007-2008

University of California, Los Angeles

RESEARCH EXPERIENCE

University of California, San Diego

Postdoctoral Fellow; Advisor: Randolph Y. Hampton

San Diego, CA
2013-present

Identified chaperones and factors required for removal of misfolded membrane proteins in the ER-Associated Degradation (ERAD) pathway

- Developed a physiological-relevant assay to identify chaperones and retrotranslocation factors in ERAD
- Constructed an optical reporter and employed it in a high throughput yeast array screen
- Analyzed rapid evolution as a result in defects of the ERAD pathway

University of California, Los Angeles

Graduate Researcher; Advisor: Carla Koehler

Los Angeles, CA
2007-2013

Identified and characterized redox proteins in the mitochondrial intermembrane space Mia40-Erv1 import pathway

- Reconstituted the mitochondria import pathway
- Identified and characterized a novel factor in the anaerobic import pathway

University of California, San Diego

Undergraduate Researcher; Advisor: Marilyn Farquhar

San Diego, CA
2006-2007

Investigate how a novel G-protein signaling pathway regulates mitochondrial fission

University of California, Los Angeles

Undergraduate Researcher; Advisor: Carla Koehler

Los Angeles, CA
2006

Investigate how the redox state of the mitochondrial intermembrane space (IMS) affects the protein import pathway

University of California, San Diego

Undergraduate Researcher; Advisor: Emmanuel Theodorakis

San Diego, CA
2005-2006

Synthesized derivatives of natural products, which were used as biological tools as potential anti-viral agents

TEACHING EXPERIENCE

University of California, San Diego

Guest Lecturer, BICD 110 Cell Biology

San Diego, CA
Spring, 2019

University of California, Los Angeles

Teaching Assistant, Introduction to Structure, Enzymes and Metabolism

Los Angeles, CA
Fall 2011

Grading Assistant, Introduction to Structure, Enzymes and Metabolism

Spring 2011

Guest Lecturer, Metabolism and its Regulation

Winter 2011

Teaching Assistant, Metabolism and its Regulation

Winter 2011, Spring 2010

Guest Lecturer, Precollege and Undergraduate Science Education Program

Winter 2008

PROFESSIONAL SERVICE

2011-2013: Affiliate, Diversity in Graduate Education STEM-PLEDGE

2006-current: Member, American Chemical Society

2006-current: Member, SACNAS member

2006-current: Member, Sigma Xi Research Society

2006-current: Member, California Alliance for Minority Participation (CAMP) in Science

2008-current: Member, American Society for Cell Biology

2008-current: Member, American Society for Biochemistry and Molecular Biology

2018-current: Member, International Zebrafish Society

2019-current: Member, International Proteolysis Society

- 2019-current: Member, Diversity Committee, Division of Biological Sciences, UCSD
- 2019-current: Member, Connections Event Committee, Division of Biological Sciences, UCSD
- 2019-current: Member, Recruitment Committee, Division of Biological Sciences, UCSD
- 2020-current: Lead of the Outreach Awards Committee, Division of Biological Sciences, UCSD
- 2020-current: Co-founder and Developer of (BUMMP) Undergraduate/Master students mentorship program, UCSD (221 mentors/134 mentees)
- 2020-current: Member of UC LEADS Steering Committee (oversee UC LEADS outreach program on state-wide level)
- 2020-current: Member of IdeaWave Campaign Committee, Division of Biological Sciences, UCSD

HONORS

- 2005-2007: UC Leadership Excellence through Advanced Degrees Fellow, UCSD
- 2007: NSF Alliance for Graduate Education and Professoriate Fellow, UCLA
- 2007-2008: Cota Robles Fellowship Award
- 2009: Excellence in Graduate Student Teaching Award, UCLA
- 2009-2011: Trainee, Cellular and Molecular Biology Training Grant, UCLA
- 2008-2013: Ruth L. Kirschstein NRSA Predoctoral Fellowship (NIGMS)
- 2014: Chancellor's Post-Doctoral Academic Diversity Award, UCSD
- 2014-2017: Ruth L. Kirschstein NRSA Postdoctoral Fellowship (NIGMS)
- 2014-current: Postdoctoral Diversity Enrichment Award, Burroughs Wellcome Fund, UCSD
- 2019-current: Selected participant in URM FOCUS training program, UCSD
- 2020-current: Pew Biomedical Science Scholar, UCSD
- 2021-current: UCSD University-wide Inclusive Excellence Award

RESEARCH PRESENTATIONS

S.E. Neal 2021. The role of rhomboid pseudoprotease Dfm1 in retrotranslocating integral membrane substrates. Invited speaker at Children's Hospital of Philadelphia. Philadelphia, PA.

S.E. Neal 2020. The role of rhomboid pseudoprotease Dfm1 in retrotranslocating integral membrane substrates. Invited speaker at the PROVIDES Seminar at UT Southwestern Medical Center, Dallas, Texas.

S.E. Neal 2020. The role of rhomboid pseudoprotease Dfm1 in retrotranslocating integral membrane substrates. Invited speaker at the Lewis & Clark College, Portland, Oregon.

S.E. Neal 2020. The role of rhomboid pseudoprotease Dfm1 in retrotranslocating integral membrane substrates. Invited speaker at the Discovering Sciences Emerging Scholars Lectures, Vanderbilt University, Nashville, Tennessee. ****Cancelled due to COVID-19**

S.E. Neal 2020. HRD complex self-remodeling enables a novel route of membrane protein retrotranslocation. Invited speaker at the GRC Membrane Transport. Galveston, Texas. ****Cancelled due to COVID-19**

S.E. Neal 2020. The role of rhomboid pseudoprotease Dfm1 in retrotranslocating integral membrane substrates. Invited speaker at the California State University Northridge, Northridge, CA.

S.E. Neal 2019. ERADicating integral membrane substrate by the rhomboid pseudoprotease Dfm1. Invited speaker at ABRCMS, Anaheim, CA.

S.E. Neal 2019. The role of rhomboid pseudoprotease Dfm1 in retrotranslocating integral membrane substrates. Invited speaker at the International Society of Proteolysis meeting, Mariánské, Czech Republic

S.E. Neal 2019. Ubiquitin-independent Hrd1 role in ERAD-M retrotranslocation. Invited speaker at the EMBO Conference, Girona, Spain

S.E. Neal and R.Y. Hampton 2017. SUSing out new (and renewed) ERAD retrotranslocation factors with a self-ubiquitinating substrate—Dfm1 is required for ERAD-M retrotranslocation. Invited speaker at the Ubiquitin meeting, Cold Springs Harbor.

S.E. Neal and R.Y. Hampton 2016. Cutting out the middleman: SUSing out new (and renewed) ERAD retrotranslocation factors with a self-ubiquitinating substrate. Invited speaker at the EMBO Conference, Girona, Spain.

S.E. Neal and R.Y. Hampton 2014. Discovering the mechanism and machinery of ERAD-M retrotranslocation. Invited speaker, Buenos Aires, Argentina.

PROFESSIONAL AFFILIATIONS

The International Society of Proteolysis

The American Society for Cell Biology

International Zebrafish Society

Cellular and Molecular Biology Trainee Adjunct

National Science Foundation Alliance for Graduate Education and the Professoriate (AGEP) Fellow

UC Leadership Excellence through Advanced Degrees (LEADS) fellow

Society for Advancement of Chicanos and Native Americans in Science (SACNAS) member

Sigma Xi Honor Research Society member

California Alliance for Minority Participation in Science, Math and Engineering (CAMP) member

American Chemical Society member

PUBLICATIONS

M., Flagg, M., Wangeline, S., Holland, **S.E., Neal** and R.Y., Hampton. (2021) Inner-Nuclear-Membrane-Associated Degradation Employs Dfm1-Independent Retrotranslocation and Alleviates Misfolded Transmembrane-Protein Toxicity.” *MBoC*. Manuscript in press.

P.E., Sam, E., Calzada, M., Acoba, T., Zhao, Y., Watanabe, A., Nejatfard, J.C., Trinidad, T., Shutt, **S.E. Neal**, and S.M., Claypool. (2021). Impaired phosphatidylethanolamine metabolism activates a reversible stress response that detects and resolves mutant mitochondrial precursors. *iScience*. Manuscript in press.

R. Kandel and **S.E. Neal**. (2020). The role of rhomboid superfamily members in protein homeostasis: Mechanistic insight and physiological implications. *BBA Molecular Cell Research*.

S.E. Neal, D. Syau, A. Nejatfard, S. Nadeau, and R.Y Hampton. 2020. HRD complex self-remodeling enables novel route of ERAD-M retrotranslocation. *iScience*.

Neal, S.E., Duttke, S, R. Hampton. (2019). Assays for protein retrotranslocation in ERAD. *Methods of Enzymology*. 618.

Neal, S.E., Jaeger, P., Duttke, S., Benner, C., Glass, C., Ideker, T., R. Hampton. (2018). The Dfm1 Derlin is Required for ERAD Retrotranslocation of Integral Membrane Proteins. *Molecular Cell*. 69, 306-320. (Highlighted: Avci, D. and Lemberg, A. (2018) *Molecular Cell*)

Neal, S.E., Dabir, D.V., Boon, C., and Koehler C.M. (2017). Osm1 is an electron acceptor of Erv1 in the Mia40-dependent import pathway. *MBoC*. 28, 2773-2785.

Neal, S.E., Mak, R., Bennett, E.J., and Hampton, R. (2017). A Cdc48 “Retrochaperone” Function Is Required for the Solubility of Retrotranslocated, Integral Membrane Endoplasmic Reticulum-associated Degradation (ERAD-M) Substrates. *J. Biol. Chem*. 292, 3112–3128.

Vashistha, N., **Neal, S.E.**, Singh, A., Carroll, S.M., and Hampton, R.Y. (2016). Direct and essential function for Hrd3 in ER-associated degradation. *Proc. Natl. Acad. Sci.* *113*, 5934–5939.

Neal, S.E., Dabir, D. V., Tienson, H.L., Horn, D.M., Glaeser, K., Ogozalek Loo, R.R., Barrientos, A., and Koehler, C.M. (2015). Mia40 Protein Serves as an Electron Sink in the Mia40-Erv1 Import Pathway. *J. Biol. Chem.* *290*, 20804–20814.

Tienson, H.L., Dabir, D. V, **Neal, S.E.**, Loo, R., Hasson, S.A., Boontheung, P., Kim, S.-K., Loo, J.A., and Koehler, C.M. (2009). Reconstitution of the mia40-erv1 oxidative folding pathway for the small tim proteins. *Mol. Biol. Cell* *20*, 3481–3490.