

Elizabeth Sandquist

Address:

Tracy Hall Science Center Rm 406
1415 Edvalson St. Dept. 2505
Ogden, UT 84408

Email: esandquist@weber.edu

EDUCATION

University of North Dakota, Grand Forks, ND Aug 2015
Ph.D. in Biochemistry and Molecular Biology
Doctoral Committee: Scott Garrett (advisor), Seema Somji, John Shabb,
Kathy Sukalski, & Van Doze.

University of North Dakota, Grand Forks, ND May 2010
B.S. in Biology and Honors Program
Minor in Spanish

EMPLOYMENT

Assistant Professor of Neuroscience
Department of Zoology, Weber State University, Ogden, UT 2018- 2019

Howard Hughes Medical Institute (HHMI) Postdoctoral Fellow 2016- 2018
Iowa State University, Ames, IA
Advisors: Drs. Craig Ogilvie (education) and Donald Sakaguchi (research)
A dual-role fellowship consisting of education and bench research.
Education Component: Coordinate and assess the Freshmen Research Initiative, a course-based research program for first-year students.
Research Component: Investigate the role of cell environment in stem cell plasticity and neuroregeneration using zebrafish.

RESEARCH

Department of Zoology, Weber State University
Assistant Professor of Neuroscience July 2018- Present
Developing zebrafish models of brain and retinal injury to study neural progenitor interactions with the environment during regeneration.

Department of Genetics, Development and Cell Biology, Iowa State University
Postdoctoral Fellow July 2015- July 2018
Advisor: Dr. Donald Sakaguchi
Investigated stem cell plasticity and regeneration of the zebrafish CNS.
Developed larval and adult zebrafish models of brain and retina injury to study how neural progenitors interact with their environment during regeneration.

Department of Biochemistry and Molecular Biology, University of North Dakota
Research Assistant Dec 2012- July 2015

Advisors: Drs. Scott Garrett and Seema Somji

Researched the role of N-cadherin in heavy metal-induced bladder cancer and progression through the epithelial-to-mesenchymal transition. Demonstrated that n-cadherin induction present *in vitro* is not recapitulated in transplants. Heterogeneous expression of N-cadherin in cell culture suggests that its expression is inhibitory to cell seeding at metastatic sites.

Department of Pharmacology, Physiology and Therapeutics, University of North Dakota

Research Assistant

June 2010- Dec 2012

Undergraduate Research Assistant

June 2009- June 2010

Advisor: Dr. Van Doze

Studied the effects of arsenic and cadmium on adult neurogenesis in mice. Mice were given chronic doses of the heavy metals, followed by behavioral tests including open field, novel object, T-maze, tail suspension, and zero maze. Proliferation and cell death were measured using immunohistochemistry.

Department of Biology, University of North Dakota

Honors Thesis

Sept 2009- May 2010

Undergraduate Research Assistant

Sept 2006- May 2010

Advisors: Drs. Peter Meberg and Sally Pyle

Explored the role of actin depolymerizing factor and cofilin on neuronal growth cones using siRNA inhibition of ADF and cofilin in primary neurons, followed by SDS-PAGE. Quantified morphology and F-actin levels in growth cones and used time-lapse microscopy to measure growth cone motility.

Publications

1. Uz, M., Hondred, J.A., Donta, M., Jung, J., Kozik, E., Sandquist, E.J., Sakaguchi, D.S., Claussen, J.C., & Mallapragada, S.K. (2019) Determination of electrical stimuli parameters to transdifferentiate genetically engineered mesenchymal stem cells into neuronal or glial lineages. *Regenerative Engineering and Translational Medicine*, 1-11.
2. Sandquist, E.S.* & Sakaguchi, D.S. (2019) Adult neural stem cell plasticity. *Neural Regeneration Research*, 14(2): 256-7. (Invited perspective)
3. Patel, B.B., Sharma, A.D., Mammadova, N., Sandquist, E. Uz, M., Mallapragada, S.K. & Sakaguchi, D.S. (2018) Nanoengineered biomaterials for retinal repair. In M. Mozafari, J. Rajadas, and D. Kaplan (eds.), *Advances in Nanoengineered Biomaterials for Regenerative Medicine*, (215-64). Elsevier. (Invited chapter)
4. Schultz, L.E., Haltom, J.A., Almeida, M.P., Wierson, W.A., Solin, S.L., Weiss, T.J., Helmer, J.A., Sandquist, E.J., Shive, H.R., & McGrail, M. (2018) Epigenetic regulators Rbbp4 and Hdac1 are overexpressed in a zebrafish model of RB1 embryonal brain tumor, and are required for neural progenitor survival and proliferation. *Disease Models & Mechanisms*, 11(6) dmm034124.
5. Sandquist, E.,* Essner, J.J, Sakaguchi, D.S.* (2018) Xenotransplantation of adult hippocampal neural progenitors into the developing zebrafish for assessment of stem cell plasticity. *PloS one*, 13(5), e0198025.
6. Sandquist, E., Uz, M., Sharma, A.D., Patel, B.B., Mallapragada, S.K. & Sakaguchi, D.S. (2015) Stem cells, bioengineering and 3-D scaffolds for nervous system repair and regeneration. In Zhang, L.G. & Kaplan, D. (Eds.) *Neural*

- Engineering: from Advanced Biomaterials to 3D Fabrication Techniques*. New York City, NY: Springer.
- Sandquist, E., Somji, S., Dunlevy, J.R., Garrett, S.H., Zhou, X.D., Slusser, A. & Sens, D.A. (2016) Loss of N-cadherin expression in tumor transplants produced from As⁺³- and Cd⁺²- transformed human urothelial (UROtsa) cell lines. *PLoS one*, 11(5), e0156310.
 - Sandquist, E. (2015) N-cadherin expression and EMT progression in arsenic- and cadmium-transformed UROtsa (Doctoral dissertation). University of North Dakota, Grand Forks, ND.

*corresponding author

Manuscript Reviewer

Neural Regeneration Research

Presentations

Sandquist, E., Friedel, K., Essner, J.J., Sakaguchi, D.S. *Matrix metalloproteinases in the regenerative zebrafish retina*.

Metalloproteases Gordon Research Conference. Lucca, Italy. May 2019.

Sandquist, E. (Speaker). *Pushing the limits of stem cell plasticity*.

University of Utah Zebrafish Interest Group. Salt Lake City, UT. April 2019.

Sandquist, E. (Speaker). *Just keep swimming: what zebrafish can teach us about brain regeneration*.

Zoology Department Seminar. Ogden, UT. November 2018.

Sandquist, E. (Speaker). *Zebrafish in research*.

Teacher Twilight Series. BioEYES: Bring LIVE Science in class. Ogden, UT. September 2018.

Sandquist, E. (Speaker). *Pushing the limits of stem cell plasticity*.

Out in Science, Technology, Engineering, and Mathematics (oSTEM). Ames, IA. October 2017.

Sandquist, E., Conyers, A., Nevin, A., Wille, N., Essner, J.J. & Sakaguchi, D.S. *Retinal regeneration in the larval zebrafish: A novel model for investigating dynamic progenitor cell behavior*.

Neuroscience Research Day. Ames, IA. September 2017.

Sandquist, E., Conyers, A., Plante, K.A., Essner, J.J., & Sakaguchi, D.S. *A xenotransplant model for neural progenitor cell plasticity*.

Neuroscience Research Day. Ames, IA. September 2016.

Sandquist, E., Essner, J.J., & Sakaguchi, D.S. *Xenotransplant model for investigation of neural progenitor cell plasticity*.

Route 28 Summit in Neurobiology. Frauenchiemsee, Germany. February 2016.

Sandquist, E., Somji, S., Sens, D.A. & Garrett, S.H. *N-cadherin upregulation in As³⁺- and Cd²⁺-transformed urothelial cells.*

Central Region IDeA Network Conference. Grand Forks, ND. June 2015.

North Dakota IDeA Network of Biomedical Research Excellence Annual Meeting.

Grand Forks, ND. November 2014.

Frank Low Research Day. Grand Forks, ND. April 2014.

North Dakota Tribal College Research Symposium. Fort Totten, ND. April 2014.

Society for Toxicology Annual Meeting. Phoenix, AZ. March 2014.

North Dakota IDeA Network of Biomedical Research Excellence Annual Meeting.

Grand Forks, ND. November 2013.

Sandquist, E., Somji, S., Sens, D.A. & Garrett, S.H. *Cadmium-induced eEF1A2 expression in transformed human urothelial cells.*

North Dakota Academy of Sciences Annual Meeting. Grand Forks, ND. 2013.

Frank Low Research Day, Grand Forks, ND. April 2013.

Sandquist, E., Doze, V. & Sens, D.A. *The effects of cadmium on neurogenesis-dependent behavior.*

North Dakota IDeA Network of Biomedical Research Excellence Annual Meeting.

Grand Forks, ND. October 2012.

Overmoe (Sandquist), E., Beausoleil, R. & Meberg, P. *Actin depolymerizing factor and cofilin knockdown in neuronal growth cones.*

Undergraduate Research Conference. Grand Forks, ND. April 2010.

Overmoe (Sandquist), E., Sens, D.A., & Doze, V. *Cadmium and stem Cells: A proposed experimental approach.*

Summer Undergraduate Research Session, Grand Forks, ND. August 2009.

Mentored Presentations

Tonks, B., Batis, L., Payne, K., MacDonald, M., & Sandquist, E. *Role of MMP2 for Retinal Regeneration in Zebrafish.*

Utah Conference for Undergraduate Research. St. George, UT. February 2022.

Batis, L., Wilkinson, J., Garrett, P., Friedel, K., Saavedra, J., Payne, K., Tonks, B. & Sandquist, E. *The role of MMP2 in zebrafish retinal regeneration.*

Society for Neuroscience. Virtual. November 2021.

Batis, L., Wilkinson, J., Garrett, P., Payne, K., Tonks, B. & Sandquist, E. *Matrix metalloprotease 2 in regeneration of the zebrafish retina.*

Utah Conference for Undergraduate Research. Provo, UT. February 2021.

Friedel, K., Whitmore, K., Saavedra, J., Stocks, C., Garrett, P., Morales, J., & Sandquist, E. *The role of MMP2 for retinal regeneration in zebrafish.*

Utah Conference for Undergraduate Research. Logan, UT. February 2020.

OUR Symposium. Ogden, UT. March 2020.

Bird, M., Burgoyne, N., Marks, W., Vander Haar, O., Herzberg, G., Plante, K., Patel, B., Sandquist, E., & Sakaguchi, D.S. *Zebrafish Used as a Model Organism to Research Blindness.*

Freshmen Research Initiative Symposium. Ames, IA. April 2018.

Buckley, C., Johnson, D., Vickery, J., Vo, P., Herzberg, G., Plante, G., Patel, B., Sandquist, E., & Sakaguchi, D.S. *Stem Cells for Neurogenesis of Retinal Neurons in Larval Zebrafish*.

Freshmen Research Initiative Symposium. Ames, IA. April 2018.

Boettger, E., Arnold, N., McDowell, M., Frantz, S., Herzberg, G., Plante, K., Patel, B., Sandquist, E., & Sakaguchi, D.S. *Tracking bipolar and ganglion stem cell proliferation in larval zebrafish after lesion*.

Freshmen Research Initiative Symposium. Ames, IA. April 2018.

Ashley, J., Burmania, L., Paris, S., Schulte, G., Herzberg, G., Plante, K., Patel, B., Sandquist, E., & Sakaguchi, D.S. *Tracking Proliferative Müller Glia Stem Cells Using PH3 and Calretinin*.

Freshmen Research Initiative Symposium. Ames, IA. April 2018.

Nevin, A., Conyers, A.,¹ Wille, N.,² Sandquist, E., Essner, J.J., & Sakaguchi, D.S. *Retinal regeneration in larval zebrafish*.

Ames Laboratory Science Undergraduate Laboratory Internship (SULI) Poster Session. Ames, IA. August 2017.

Summer REU Research Symposium. Ames, IA. August 2017.

Conyers, A.,¹ Nevin, A., Wille, N.,² Sandquist, E., & Sakaguchi, D.S. *Exploring retinal regeneration using zebrafish*.

STEM Summer Institute, Ames, IA. July 2017

Wille, N.,² Conyers, A.,¹ Nevin, A., Sandquist, E., Essner, J.J., & Sakaguchi, D.S. *Retinal regeneration in larval zebrafish*.

STEM Summer Institute, Ames, IA. July 2017.

Lo, N.I., Thielen, B., Sandquist, E., Essner, J.J. & Sakaguchi, D.S. *Interrogating adult neural stem cell plasticity using a zebrafish model*.

Honors Poster Session. Ames, IA. April 2017.

Thielen, B., Lo, N.I., Sandquist, E., Essner, J.J. & Sakaguchi, D.S. *Investigating adult stem cell regulation using a zebrafish transplant model*.

Honors Poster Session. Ames, IA. April 2017.

Herzberg, G., Peng, S., Sharp, K., Sandquist, E., & Sakaguchi, D.S. *Neuroplasticity in the injured developing zebrafish retinotectal system*.

Freshmen Research Initiative Symposium. Ames, IA. April 2017.

Honors Poster Session. April 2017.

Houck, N., Liu, J., Perera, A., Patel, B., Sandquist, E., & Sakaguchi, D.S. *Applying the regenerative properties of zebrafish to humans*.

Freshmen Research Initiative Symposium. Ames, IA. April 2017.

Gard, M., Lorber, A., Sadler, M., Patel, B., Sandquist, E., Sakaguchi, D.S. *Retinal regeneration of larval zebrafish*.

Freshmen Research Initiative Symposium. Ames, IA. April 2017.

Haldin, E., Passek, E., Trice, N., Patel, B., Sandquist, E. & Sakaguchi, D.S. *Stem*

cell proliferation during retinal lesion of larval zebrafish.

Freshmen Research Initiative Symposium. Ames, IA. April 2017.

Lawless, C., Post, M., Vang, Y., Patel B., Sandquist E., & Sakaguchi D.S. *Neural regeneration behaviors of cells in larval zebrafish retina.*

Freshmen Research Initiative Symposium. Ames, IA. April 2017.

Collazo Martinez, A.D.,³ Sandquist, E., Patel, B., & Sakaguchi, D.S. *Growth of adult hippocampal progenitor cells at a reduced temperature.*

IINSPIRE Louis Stokes Alliance for Minority Participation Annual Conference. Ames, IA. February 2017.

Conyers, A.,¹ Dang, M.,² Sandquist, E.S., & Sakaguchi, D.S. *Zebrafish: a model for stem cell transplantation.*

Research Experience for Teachers Poster Reception. Ames, IA. July 2016.

Young Engineer and Scientist Poster Reception. Ames, IA. July 2016.

Horger, M., Ryder, Z., Wehlage, B., Patel, B., & Sandquist, E. *The xenotransplantation and differentiation of rat AHPCs in zebrafish blastulas.*

Freshmen Research Initiative Symposium. Ames, IA. April 2016.

Benz, A., Knuth, E., Wickham, H., Patel, B., and Sandquist, E. *Immunohistochemical characterization of xenotransplanted adult rat hippocampal progenitor cells.*

Freshmen Research Initiative Symposium. Ames, IA. April 2016.

Kull, S., Welling, K., Zmich, A., Patel, B. & Sandquist, E. *Examining adult stem cell plasticity through xenotransplantation of rat hippocampal progenitor cells.*

Freshmen Research Initiative Symposium. Ames, IA. April 2016.

Titcomb, T.J., Sandquist, E., Garrett, S.H., Sens, D.A. & Somji, S. *Expression of EphA4 and NTF-3 in heavy metal induced bladder cancer.*

National Idea Symposium of Biomedical Research Excellence. Washington, DC. June 2014.

Titcomb, T.J., Sandquist, E., Sens, D.A. & Somji, S. *Expression of EPHA4 in arsenite and cadmium transformed UROtsa cells and their corresponding tumor heterotransplants.*

North Dakota IDeA Network of Biomedical Research Excellence Annual Meeting. Grand Forks, ND. November 2014.

Frank Low Research Day. Grand Forks, ND. April 2014.

North Dakota Tribal College Research Symposium. Fort Totten, ND. April 2014.

North Dakota IDeA Network of Biomedical Research Excellence Annual Meeting. Grand Forks, ND. November 2013.

Summer Undergraduate Research Session, Grand Forks, ND. August 2013.

Millbridge, A., Sandquist, E., Sens, D.A. & Somji, S. *Expression of ITM2C in As⁺³ and Cd⁺² transformed UROtsa cells and their corresponding tumor heterotransplants.*

North Dakota IDeA Network of Biomedical Research Excellence Annual Meeting. Grand Forks, ND. November 2014.

Frank Low Research Day. Grand Forks, ND. April 2014.

North Dakota Tribal College Research Symposium. Fort Totten, ND. April 2014.

North Dakota IDeA Network of Biomedical Research Excellence Annual Meeting.
Grand Forks, ND. November 2013.

Summer Undergraduate Research Session, Grand Forks, ND. August 2013.

LaVallie, A.,⁴ Sanquist, E., Somji, S., Sens, D.A. *The solute carrier SLC16A14 and the neuroregulatory SLITRK6 genes as possible biomarkers for bladder carcinomas.*

ND INBRE Undergraduate Research Symposium. Grand Forks, ND. Oct 2013.

Dvorak, S., Euscher, C., Sandquist, E., Sens, D.A. & Doze, V. *The effects of cadmium on cell death in the dentate gyrus of adult mice.*

North Dakota IDeA Network of Biomedical Research Excellence Annual Meeting.
Grand Forks, ND. October 2011.

Summer Undergraduate Research Session, Grand Forks, ND. August 2011.

Heller, E., Sandquist, E., Sens, D.A. & Doze, V. *The effect of cadmium on adult neurogenesis and apoptosis.*

Frank Low Research Day, Grand Forks, ND. April 2011.

Summer Undergraduate Research Session, Grand Forks, ND. August 2010.

¹Biology teacher at West High School, Waterloo, IA

²High school students from central Iowa

³Student in Iowa, Illinois, Nebraska Louis Stokes Alliance for Minority Participation program

⁴Instructor at Turtle Mountain Community College, Belcourt, ND

Undergraduate Research Advisement

Undergraduate Research Awards

Brayden Carter Spring 2022

“Establishing a Critical Timeline for MMP2 Expression and Cell Proliferation.”

\$3,130.00

Landry Batis Fall 2021

“Role of Matrix Metalloproteinase 2 in Stem Cell Retinal Regeneration.”

\$950.00

Cristine Stacey (Co-mentor with Dr. Jim Hutchins)

“Altered gene expression in a zebrafish model of autism.” Fall 2020

\$2,871.78.

Mackenzie Moon (Co-mentor with Dr. Jim Hutchins)

“Validating behaviors in zebrafish models of autism spectrum disorder research.” Fall 2020

\$1,994

Brittney Child (Co-mentor with Dr. Jim Hutchins)

“Gene Expression in Valproic Acid Treated Zebrafish.” Spring 2020

\$2,545.00

Kelton Friedel

“The role of metalloproteases in retinal regeneration in zebrafish.” OUR Research Grant. Spring 2019

\$993.84

<i>Mentoring Undergraduate Researchers: Weber State University, present</i>	
Grace Hansen (Biochemistry)	Fall 2022
Project: Zebrafish husbandry	
Justyce Jeurgens (Psychology)	Fall 2022
Co-mentor with Dr. Jim Hutchins	
Project: Zebrafish husbandry.	
Madisyn Carrington (Psychology)	Summer 2022-Present
Co-mentor with Dr. Jim Hutchins	
Project: Identify changes in behavior in a zebrafish model of autism. Zebrafish husbandry.	
Brayden Carter (Psychology)	Fall 2021-Present
Project: Measuring MMP2 expression, stem cell proliferation and cell death in the regenerating retina. Zebrafish husbandry.	
Benjamin Packard (Microbiology)	Spring 2022-Present
WSU Research Fellow	
Project: Measuring proliferation and cell death in the regenerating retina. Zebrafish husbandry.	
Preston Snider (Zoology)	Spring 2022-Present
Project: Zebrafish husbandry	
Derek Keeney (Athletic Therapy)	Spring 2022-Present
Project: Measuring proliferation in the regenerating retina. Zebrafish husbandry.	
<i>Previous</i>	
Sarah Clark (Psychology)	Summer 2021-Spring 2022
Aislinn Martinez (Zoology)	Spring 2021
Christine Tracey (Psychology)	Fall 2020- Summer 2022
Braxton Tonks (Athletic Therapy)	Fall 2020- Fall 2021
Mackenzie Moon (BIS)	Fall 2020-Summer 2021
Ashleigh Steed (Psychology)	Summer 2020-Summer 2022
Kevin Payne (Microbiology)	Summer 2020-Fall 2021
Brittney Child (Zoology)	Summer 2020-Fall 2021
Jackeline Wilkinson (Zoology)	Spring 2020-Fall 2020
Stockton Archuletta (Exercise and Sports Science)	Spring-Summer 2020
Landry Batis (Zoology)	Fall 2019- Fall 2021
Andrew Maloy (BIS)	Fall 2019
A.J. Walters (Biological/ Biosystems Engineering) ¹	Fall 2019
Justin Morales (Zoology)	Summer 2019-Spring 2020
Jesus Saavedra (Psychology)	Spring 2019-Spring 2020
Patrick Garrett (Psychology)	Spring 2019-Summer 2020
Connor Stocks (Zoology)	Spring 2019-Summer 2020
Kimberlee Whitmore (Zoology)	Spring-Fall 2019
Codee Harris (Zoology)	Spring 2019

Mentoring Undergraduate Researchers: Iowa State University: 2015-2018
 Sean Demes, Alex Conyers,² Alison Nevin, Noah Wille,³ Mai Dang,³ Taylor Vittitoe,
 Kaelee Plante, Sara Stuedemann, Brian Thielen, Indiana Lo, Anna Zmich, Ana Collazo
 Martinez,⁴ Grace Herzberg, Stephen Peng, Kathryn Sharp, and Tabby Madni.⁵

Mentoring Undergraduate Researchers: University of North Dakota: 2010- 2015
 Bethany Erickson, Sarah Hagley, Boma Afonya, Dallas Hepper, Mitch Sand, Tyler Stein,
 Nathaniel Schroeder, Brett Johnson, Tyler Titcomb, Andrew Millbridge, Shelby Dvorak,
 Courtney Euscher, Eric Heller, and Audrey LaVallie.⁶

¹Undergraduate at Utah State University, Logan, UT.

²Biology teacher at West High School, Waterloo, IA

³High school students from central Iowa

⁴Iowa, Illinois, Nebraska Louis Stokes Alliance for Minority Participation (IINSPIRE
 LSAMP) student

⁵International student

⁶Instructor at Turtle Mountain Community College, Belcourt, ND

FELLOWSHIPS AND AWARDS

Dee Family Technology Grant: \$8,728.98 2022
 Quantitative genetic analysis for teaching and research laboratories
 Academic Resources and Computing Committee, Weber State University

Travel Award: \$750 2021
 Research, Scholarship, and Professional Growth Committee, Weber State University

Hemingway Collaboration Award: \$10,896.00 2021
 Research, Scholarship and Professional Growth Committee, Weber State University
 Expansion of the Sandquist Lab Zebrafish Facilities
 Role: Co-Investigator. Co-PI: Jim Hutchins.

Dee Family Technology Grant: \$2,300 2020
 Academic Resources and Computing Committee, Weber State University
 Digital Imaging System for Cell Biology and Genetics.
 Co-PI with Dr. John Clark.

Hemingway New Faculty Grant: \$1,486 2019
 Research, Scholarship and Professional Growth Committee, Weber State University
 Role: Primary Investigator.

Previous Institutions

Teaching as Research Award: \$1,875 2016- 2017
 HHMI Engage to Excel Freshmen Research Initiative Award Oct 2015- May 2017
 Route 28 Summit in Neurobiology Travel Award 2016
 Research Development and Compliance Student Travel Award 2014, 2015
 School of Graduate Studies Doctoral Student Travel Support Fund 2013, 2015
 Intercollegiate Academic Funding Award 2013, 2015

TEACHING

Introduction to Neuroscience NEUR 2050 Fall 2020, Fall/Spring 2021, Fall 2022
Weber State University
Co-instructed lecture with Dr. Jim Hutchins 2020-21. Three credits.

Principles of Zoology ZOOL 1110 Spring & Fall since 2019
Weber State University
Instruct lecture and multiple lab sections of four-credit course.

Cell Biology ZOOL 3200 Fall 2018, Spring & Fall since 2019
Weber State University
Instruct lecture and lab. Four credits.

Seminar: Stem Cells in the 21st Century ZOOL 4990 Spring 2020
Weber State University
Instruct journal club-style seminar. One credit.

Freshmen Research Initiative Summer 2015-2018
Iowa State University
Advisor: Dr. Craig Ogilvie
Coordinate a program which promotes course-based undergraduate research experiences at the introductory level across multiple science disciplines. Interact with faculty to implement research courses and integrate them within the program curriculum. Recruit and assess freshmen in the program. Perform research on science self-efficacy and identity to promote retention of STEM majors. The program currently supports 12 courses.

Stem Cells for Neuroregeneration Spring 2016- Spring 2018
Department of Genetics, Development and Cell Biology, Iowa State University
Instructor
Advisor: Dr. Don Sakaguchi
Course in the Freshmen Research Initiative.
BIOL499. 2 credits. Enrollment: 11-16

Undergraduate Biochemistry
Department of Biochemistry and Molecular Biology, University of North Dakota
Research Assistant Jan 2013- June 2015
Teaching Assistant Spring 2013
Advisors: Drs. Kathy Sukalski and John Shabb
BMB301. Enrollment: 150.
Facilitated learning activities, graded assignments, designed and led one class. Designed and graded a portion of one exam. Utilized a SCALE-UP (Student-Centered Active Learning Environment for Undergraduate Programs) room to teach Process Oriented Guided Inquiry Learning (POGIL) and performed course assessment for educational research.

Publications

Sandquist, E.,* Cervato, C, & Ogilvie, C.A. (2019) Positive affective and behavioral gains of freshmen in course-based research across disciplines. *Scholarship and Practice of Undergraduate Research*. 2(4): 45.

Sandquist, E., Schofield, B., Taylor, K., Engel, A., Liu, J., Putzke, A., Sagwan-Barkdoll, L., Walsh, S., Buchanan, T., Barton, L., Resendes, K., & Wolyniak, M.J. A Community of Practice for CURE Development: The MIRIC (Mentoring the Integration of Research into the Classroom) Network. *In preparation*.

*corresponding author

Presentations

Wolyniak, M.J., Barton, L., Putzke, A., & Sandquist, E. Workshop. *Authentic Research Opportunities for All through CUREs: The Council on Undergraduate Research (CUR) Mentorship for Integrating Research Into the Classroom (MIRIC) program*.

American Association of Colleges & Universities Annual Conference. Virtual. January 2022.

Powell-Coffman, J.A., Ogilvie, C.A., & Sandquist, E. Workshop. *Multi-department reforms in STEM education: strategies framed by emergent and systems change theory*.

Transforming STEM Higher Education: Discovery, Innovation, and the Value of Evidence. San Francisco, CA. November 2017.

Halligan, T. Cervato, C., Ogilvie, C.A., & Sandquist, E.S. *IOWATER: A Freshman Research Initiative for geology and meteorology majors*.

Geological Society of America Annual Meeting. Seattle, WA. October 2017.

Powell-Coffman, J.A., Ogilvie, C.A., & Sandquist, E. *Engaging more students in doing science early in college: Multi-department reform*.

Transforming STEM Higher Education: Discovery, Innovation, and the Value of Evidence. San Francisco, CA. November 2017.

Iowa State University Research Day. April 2018.

Sandquist, E. & Knaub, A. Workshop. *Institutionalizing course-based undergraduate research at the introductory level*.

Transforming Research in Undergraduate STEM Education (TRUSE) Conference. St. Paul, MN. July 2017.

Sandquist, E. & Ogilvie, C. *Impact of introductory course-based research on gains in self-efficacy, science identity, and sense of community leading to persistence in STEM*.

Transforming Research in Undergraduate STEM Education (TRUSE) Conference. St. Paul, MN. July 2017.

Society for the Advancement of Biology Education Research (SABER) National Meeting. Minneapolis, MN. July 2017.

Powell-Coffman, J.A., Campbell, A., Coffman, C., Essner, J., Kraft, J., Ogilvie, C., Saldanha, J., Sandquist, E., Yandean-Nelson, M. *Advancing student success through evidence-based practices at a large research university*.

Gordon Research Conference: Undergraduate Biology Education Research.
Easton, MA. July 2017.

Sandquist, E. (speaker), Cervato, C., & Ogilvie, C.A. *The Freshman Research Initiative: promoting STEM identity through introductory course-based research.*

IINSPIRE Louis Stokes Alliance for Minority Participation Annual Conference.
Ames, IA. February 2017.

Guest panelist with Emily Bowers and Dr. Peter Savolainen. *Implementing freshman research initiatives with learning communities.*

ISU Learning Communities Mid-Year Institute. Ames, IA. January 2017

Sandquist, E.J., Patel, B.B., Essner, J.J., Ogilvie, C.A., & Sakaguchi, D.S. *Freshmen research initiative in neuroscience.*

Society for Neuroscience. November 2016.

Sandquist, E. Coffman, C., Cervato, C., Essner, J., Ogilvie, C.A. *Implementation of the Freshmen Research Initiative at Iowa State University.*

Council for Undergraduate Research. Tampa, FL. June 2016.

Sandquist, E. Coffman, C., Cervato, C., Essner, J., Ogilvie, C.A. *A unique training program for teaching assistants in the Freshmen Research Initiative.*

Council for Undergraduate Research. Tampa, FL. June 2016.

Sandquist, E., Cervato, C., Flory, D., Essner, J.J., & Ogilvie, C.A. *Iowa State University Freshmen Research Initiative.*

Freshman Research Initiative Conference. Austin, TX. March 2016.

Sandquist, E. (2014) SCALE-ing UP Biochemistry Education. *On Teaching* 23(6): 1-3.

Sandquist, E., ChallaSivaKanaka, S., Sukalski, K. & Shabb, J. *Lecture-free student-centered learning in a large-enrollment biochemistry course: assessment of student engagement, perceptions, and learning outcomes.*

UND Active Learning Workshop. Grand Forks, ND. April 2014.

UND Graduate School Scholarly Forum. Grand Forks, ND. March 2014.

American Society for Biochemistry and Molecular Biology (ASBMB) Special Symposia: Student centered education in the molecular life sciences. Seattle, WA. August 2013.

Guest speaker with Dr. John Shabb. *Lecture-free student-centered learning in a large-enrollment biochemistry course.*

University of North Dakota Center for Instructional and Learning Technologies.
Grand Forks, ND. May 2013.

News Features

Smith, M. (2020, September 9). COVID-19 Impacts WSU Student, Faculty Scientific Research. *WSU Today*.

https://www.weber.edu/WSUToday/091020_ScienceDelay.html

Cassutt, A. (2017, October 20). Freshman Research Initiative aims to give freshman STEM students research opportunities. *Iowa State Daily*. Retrieved from http://www.iowastatedaily.com/news/article_2b24228a-b5ab-11e7-9b79-ab2eda2e8e50.html

Iowa State University Alumni Association. (2017, October 4). Retaining Students in STEM and Preparing Them for the Future. *Alliance for Iowa State*. Retrieved from <http://campaign.r20.constantcontact.com/render?m=1111749662211&ca=c2700c51-54b0-4bc8-8682-6664abccdad2>

SERVICE

Committees

NSF Diversity in STEM Steering Committee Fall 2022
Weber State University
Writing a grant with members of the College of Science.

College of Science Research Instrumentation Committee Fall 2022
Weber State University
Created proposal for instrumentation user fees for the College of Science.

Institutional Biosafety Committee Spring 2021-Present
Weber State University
Reviews, approves and oversees research involving the use of recombinant or synthetic DNA/RNA and other biohazards.

Curriculum Committee Chair, Neuroscience Program Spring 2021- Present
Weber State University
Assess curriculum and determine changes required to improve the program.

Biology Division Councilor, Council for Undergraduate Research Spring 2021- Present
Provides networking opportunities, activities, and resources to assist biology administrators, faculty members, students, practitioners, mentors, and others in advancing undergraduate research.

Principles of Zoology Lab Curriculum Committee, Chair Fall 2020-Present
Update and revise manual for multiple ZOOL 1110 lab sections each semester. Develop new lab modules as needed. Led transition to online lab format during COVID-19.

Mentoring the Integration of Research into the Classroom (MIRIC) Advisor Committee, Council for Undergraduate Research Summer 2020-Present
Provides a means for new and future faculty to receive long-term mentorship opportunities in the development of course-based research experiences.

Curriculum Committee, Office of Undergraduate Research Spring-Fall 2020
Weber State University
Created course-based research designation for WSU courses.

Science Education Committee, Center for Science and Math Education Fall '19- Present
Weber State University

Coordinates and supports science education majors in the College of Science. Duties include course/program review, scholarships awards, working with the College of Education and the Utah State Board of Education licensing/endorsements, recruitment and advising.

Institutional Animal Care and Use Committee Fall 2018- Present
Weber State University
Review and regulate animal research performed at Weber State University.

Neuroscience Program Committee Fall 2018- Present
Weber State University
Oversee the Neuroscience Program, which is advised by the Psychology and Zoology departments to provide undergraduates a minor in Neuroscience. Aided in the development of student award program beginning Fall 2018.

Graduation Committee Fall 2019- Present
Weber State University
Represent the Zoology Department at the College of Science Convocation Ceremony.

Tracy Hall Interior Task Force Summer- Fall 2018
Weber State University
Complete interior design elements of the new Tracy Hall science building.

Research Faculty Learning Community July 2015- July 2018
Iowa State University
Strategized mechanisms to implement active learning pedagogy. Created the internet resource "Big Data for Introductory Research." <http://www.engage.iastate.edu/big-data-for-introductory-research>

Freshmen Research Initiative TA Learning Community Jan 2016- July 2018
Iowa State University
Facilitate graduate teaching assistants' professional development and promote effective teaching strategies for their courses in the Freshmen Research Initiative.

Advisement

Neuroscience Club Faculty Co-Advisor Fall 2019- Spring 2022
Support undergraduate club activities including neuroscience outreach and fundraisers. Co-advisor with Dr. Todd Hillhouse or Dr. Aminda O'Hare.

Interim Bachelor of Integrated Studies Advisor Spring 2018- Fall 2019
Zoology Department, Weber State University
Advised students while Dr. Brian Chung was on sabbatical.

Pre-Graduate Advisor Fall 2018- Present
Zoology Department, Weber State University
Advised students with Dr. Rebecka Brasso on graduate school opportunities. Included seminars and individual advisement.
"Preparing Your Graduate School Application Materials" Feb 2019
"Preparing for Graduate School" Nov 2018, Oct 2019

Guest speaker

Understanding Graduate School Programs & the Application Process. September 2019
Neuroscience Lecture Series. Weber State University. Ogden, UT.

Women in STEM. October 2018
Weber State University. Ogden, UT.

Guest speaker with Dr. Donald Sakaguchi. *The Sakaguchi Lab: Stem cells and cellular engineering for brain rescue and repair*.
Sophomore Biology at West High School. Waterloo, IA. March 2017.

Science Writing

Sandquist, E. (2018) Blog post. *Weber Blog for Science*. Retrieved from
<https://www.weber.edu/cos/professor.html>

Sandquist, E., Peterson, S.C., & Smith, C.J. (2017) 2017 Midwest zebrafish meeting report. *International Zebrafish Society*. Retrieved from
<http://www.izfs.org/general/custom.asp?page=2017MIDWESTMTGREPORT>

Sandquist, E., Petersen, S.C., Smith, C.J. (2017) 2017 Midwest zebrafish meeting report. *Zebrafish*. doi: 10.1089/zeb.2017.1500. [epub ahead of print].

Sandquist, E. (2017) Stem Cells for Neuroregeneration: A course in the Freshmen Research Initiative. *SYNAPSE*. Summer 2017. Retrieved from
http://www.neuroscience.iastate.edu/sites/default/files/uploads/SYNAPSE%20Newsletter/SYNAPSE_Summer2017.pdf

Sandquist, E. (2014) Using active-learning approaches in a lecture hall. *ASBMB Today*. 13(11): 22-23. Retrieved from
<http://www.asbmb.org/asbmbtoday/201412/Education/>

Sandquist, E. (2013) How to become a good lab manager. *ASBMB Today*. 12(9): 20-23. Retrieved from
http://www.asbmb.org/asbmbtoday/asbmbtoday_article.aspx?id=48974
Cited in 6 publications.

Sandquist, E. (2012, January- Present) *Everydaybiochemistry*. Retrieved from
<http://everydaybiochemistry.wordpress.com/>

REFERENCES:

Dr. Ron A. Meyers

Professor and Chair
Department of Zoology
Tracy Hall, Rm 412
1415 Edvalson St.
Ogden, UT 84408
Ph: 801-626-6170
rmeyers@weber.edu

Dr. James Hutchins

Professor
Department of Health Sciences
Davis Campus D3 217
Layton, UT 84041
Ph: 801-395-3420
jimhutchins@weber.edu

Dr. Craig Ogilvie

Dean of the Graduate School and Associate Vice-President of Research
Montana State University
108 Montana Hall
P.O. Box 172580
Bozeman, MT 59717
Ph: 406-994-4145
craig.ogilvie@montana.edu