

## ELIZABETH YVETTE HEEG, PhD

Accomplished Biology Professor with over 20 years of experience teaching molecular biology, microbiology, and biochemistry. Recognized for excellence in teaching, student mentorship, interdisciplinary scholarship, and guiding students through pre-medical preparation. Dedicated to fostering academic growth, advancing undergraduate research, and thoughtfully integrating faith and science to inspire the next generation of scholars and healthcare professionals.

Orange City, IA | 712.230.0400 | elizabeth.heeg@nwciova.edu

### EDUCATION

#### Ph.D. in Biochemistry, Molecular Biology, and Cell Biology

Northwestern University | Evanston, IL | December 2006

GPA: 4.0/4.0

- Thesis: "Lef-1 and Tcf-3 have distinct activities during ectodermal patterning in *Xenopus*"
- Advisor: Dr. Carole LaBonne

#### Bachelor of Arts in Biology-Health Professions

Northwestern College | Orange City, IA | May 2001

GPA: 3.75/4.0

### EMPLOYMENT EXPERIENCE

#### Professor | Department of Biology

2019–Present

#### Associate Professor | Department of Biology

2013–2019

#### Assistant Professor | Department of Biology

2006–2013

Northwestern College | Orange City, IA

- Teach undergraduate biochemistry (molecular biology and microbiology), anatomy & physiology, and graduate courses in microbiology
- Develop and implement innovative teaching strategies and lab experiences

#### Academic Advisor | Department of Biology

2007–Present

Northwestern College | Orange City, IA

- Advise 30–40 students annually, focusing on academic success and career placement
- Serve as faculty advisor for the Pre-Health Professions Club, guiding students towards understanding the application process of various health profession programs

#### AptarePrep MCAT Project Manager

2017–Present

MedAdapt | Orange City, IA

- Oversee curriculum development for AptarePrep MCAT – a practice-based learning software program for pre-medical students
- Guided content authors on MCAT style and standards, ensured comprehensive question bank coverage, and represented the program at regional and national conferences for pre-medical advisors.

### ACADEMIC COURSES TAUGHT:

BIO499	Honors Research
BIO450	Science and Christian Faith Senior Seminar
BIO417	Internship Supervisor (EMT experience and Education)
BIO350L	Special Topics: Developmental Biology Lab
BIO350	Special Topics: Developmental Biology
BIO327L	Biochemistry: Molecular Genetics Lab
BIO327	Biochemistry: Molecular Genetics
BIO326L	Biochemistry: Proteins and Metabolism Lab
BIO326	Biochemistry: Proteins and Metabolism

BIO310	Cell Biology
BIO203L	Microbiology Lab
BIO203	Microbiology
BIO121L	Introduction to Human Anatomy Lab
BIO115L	General Biology: Molecular & Cellular Biology Lab
BIO102	Human Anatomy and Physiology
BIO102L	Human Anatomy and Physiology Lab
GEN205	Honors Seminar: Faith-rooted Neighboring
IGE105	Honors First Year Seminar

## RESEARCH MENTORSHIP

Jessica Slight, Utilizing RT-PCR to examine Mycobacteriophage JacoRen57 gene expression, Honors Research Advisor, Northwestern College, Fall 2023.

Everett Fedders, Examining the level of bacteria in pasteurized vs. raw milk, High School Science Project Supervisor, Spring 2023

Kaytlyn Harms, Utilizing RT-PCR to examine Mycobacteriophage JacoRen57 gene expression, Honors Research Advisor, Northwestern College, Fall 2022.

Ali Almail, Analysis of a Putative Promoter in Mycobacteriophage JacoRen57, Honors Research Advisor, Northwestern College, Spring 2020.

Brenden Van Der Werff, Epigenetic Modifications via Methylation, Honors Research Advisor, Northwestern College, Spring 2019.

Katie DeKruyff, Carlson Internship at Trans Ova, Sioux Center, IA, Internship Supervisor, Summer 2018.

Shelby Van Den Berg, Carlson Internship at Gelita, Sioux City, IA, Internship Supervisor, Northwestern College, Summer 2018.

Nnenna Nwaelugo, Mutating eNOS—Creating a Heme-Deficient Enzyme, Honors Research Advisor, Northwestern College, Spring 2018.

Molly Cunard, Carlson Internship at AbbVie Labs, Chicago, IL, Internship Supervisor, Northwestern College, Summer 2014.

Klint Knutson, Mutating eNOS, Honors Research Advisor, Northwestern College, Fall 2015.

Jillian Estes, Carlson Internship at Trans Ova, Sioux Center, IA, Internship Supervisor, Northwestern College, Summer 2014.

Kelley Thurman, Laura Hurley, Emily Nienhuis, and Megan Feuchtenberger, Investigating MRSA on NWC's campus, Research Advisor, Northwestern College, Spring 2013—Spring 2014.

Andrea Hallberg, Investigating MRSA, Honors Research Advisor, Northwestern College, Spring 2013.

Taylor Driese, Mark Blankers, and Brandon Hammack, Investigating MRSA in NWC Wrestlers Compared to Non-Athletes, Research Advisor, Northwestern College, Fall 2012—Spring 2013.

Heidi Postma, Investigating Staphylococcal Infections in Rural Iowa, Research Advisor, Northwestern College, Fall 2011.

Matt Negaard, Investigating MRSA in NWC Wrestlers Compared to Non-Athletes, Honors Research Advisor, Northwestern College, Spring 2012.

Cherylyn Vande Glind, Examining Homocysteine's Effect on *Xenopus laevis* early development, Research Advisor, Dordt College Senior Research Project, Spring 2010.

Rachel Shultz and Brittany Montgomery, Mutating GFP, Research Advisor, Northwestern College Junior Scholars Program, Fall 2009.

Jackie Knibbe, PCR Analysis as a Possible Means for Sex Determination of Eastern Redcedar, Research Advisor, Northwestern College, Spring 2009.

Michelle Methers, Water Metabolism by High and Low Renin Rats, Research Advisor, Northwestern College, Spring 2008.

## PRESENTATIONS

- Invited speaker, "A Glimpse at My Fall 2024 Sabbatical Research," Fall NWC Board of Trustees meeting, Northwestern College, Orange City, IA. October 2, 2025.
- Poster presenter, "Genetic Screen to Understand Phage Gene Function," Celebration of Research, Northwestern College, Orange City, IA, April 2025.
- Invited speaker, "Understanding the MCAT," Virtual Education Workshop Online, A.T. Still University. Kirksville, MO. Fall 2024.
- Poster presenter, "mRNA Production of Gene 50 in JacoRen57", Iowa Academy of Sciences, Cedar Falls, IA, April 2023.
- Poster presenter, "mRNA Production of Gene 50 in JacoRen57", Celebration of Research, Northwestern College, Orange City, IA, April 20 2023.
- Invited speaker, "NWC Science and Faith Distinctives," Fall STEM recruitment day, Northwestern College, Orange City, IA. Fall 2020, 2021, 2022, 2023.
- Poster presenter, "Concept Design for Optical Tweezers to be used in DNA Research," Celebration of Learning, Northwestern College, Orange City, IA, April 2022.
- Poster presenter, "Investigating the Putative RecA-Like Recombinase Gene," Celebration of Learning, Northwestern College, Orange City, IA, Spring 2022.
- Invited speaker, "Understanding the MCAT," Virtual Education Workshop. Online, A.T. Still University. Kirksville, MO. February 17, 2022.
- Invited Speaker, "Examining Gender as a Scientific Construct," Women's Leadership Session. Northwestern College, Orange City, IA. January 13, 2022.
- Poster presenter, "Exploring a Transcriptional Regulatory Region in Mycobacteriophage JacoRen57," Celebration of Learning, Northwestern College, Orange City, IA, Spring 2021.
- Poster presenter, "Exploring a Transcriptional Regulatory Region in Mycobacteriophage JacoRen57," Celebration of Learning, Northwestern College, Orange City, IA, Spring 2020.
- Conference speaker, "Understanding the MCAT," Heartland PreMed Conference. A.T. Still University. Kirksville, MO. September 7, 2019.
- Conference speaker, "Understanding the MCAT," Heartland PreMed Conference. A.T. Still University. Kirksville, MO. September 8, 2018.
- Invited Speaker, Fall Faculty Workshop: Diversity Matters, Northwestern College, Orange City, IA. August 16, 2018
- Experiential Workshop Leader, NW Iowa Cultural GRIT Conference, Northwestern College, Orange City, IA., 2017 and 2018.
- Invited Speaker, "Preparing for the MCAT", Loras College, Dubuque, IA. March 7, 2018
- Invited Speaker, "Preparing for the MCAT", Dakota Wesleyan University, Mitchell, SD. February 2, 2018
- Poster Presenter, "Identifying Rare Phage Clusters," Iowa Academy of Sciences, Buena Vista University, Storm Lake, IA. April 20, 2018
- Poster Presenter, "Mutating eNOS", Iowa Academy of Sciences, Buena Vista University, Storm Lake, IA. April 20, 2018
- Invited Speaker, "Preparing for the MCAT", Luther College, Decorah, IA. February 2, 2017
- Invited Speaker, "Preparing for the MCAT", Dordt College, Sioux Center, IA. November 9, 2017
- Conference Speaker, "To Prep or Not to Prep." Central Association of Advisors for the Health Professions Meeting. Des Moines, IA. April 21, 2017
- Speaker, "Recognizing and Reconciling: Examining a true story of exploitation done in the name of science," Day of Learning in Community, Northwestern College, Orange City, IA. Spring 2016.
- Poster Presenter, "Examining MRSA on NWC's campus," Iowa Academy of Sciences Conference, Fort Dodge, IA. Spring 2014.

Poster Presenter, "Diagnosing and Evaluating the presence of MRSA on a Northwest Iowa College Campus," Iowa Academy of Sciences Conference, Spring 2013.

First Year Seminar Panelist, Discussing *The Ghost Map*, Northwestern College, Orange City, IA, November 2012 & 2013.

Fall Orientation Speaker, Northwestern College, Orange City, IA, Fall 2012.

Commencement Address Speaker, Northwestern College Spring Commencement, Orange City, IA, Spring 2011.

One Night Honors Seminar Lecturer, "A Lesson in Knitting," Northwestern College, Orange City, IA, Spring 2011.

Keynote Address Speaker, Northwestern College Scholarship Luncheons, Orange City, IA, Spring 2011.

Poster Presenter, "A Laboratory Exercise in Subcloning and Ligating," National Association of Biology Teachers Professional Development Conference, Minneapolis, MN. Fall 2010.

Poster Presenter, "An Ongoing Study of Water Metabolism by High and Low Renin Rats," Iowa Physiology Society, Des Moines, IA. Fall 2010.

Keynote Address Speaker, Northwestern College Praise and Worship, Orange City, IA, Fall 2010.

Poster Presenter, "PCR Analysis as a Possible Means for Sex Determination of Eastern Redcedar (*Juniperus virginiana*)," Northwestern College Board meeting, Orange City, IA. Spring 2009.

Poster Presenter, "PCR Analysis as a Possible Means for Sex Determination of Eastern Redcedar (*Juniperus virginiana*)," Iowa Academy of Sciences, Iowa City, IA. April 2009.

Poster Presenter, "Water Metabolism by High and Low Renin Rats", Northwestern College Board meeting, Orange City, IA. Spring 2008.

Chapel Speaker, Northwestern College Chapel Program, Orange City, IA, Spring 2008.

## PUBLICATIONS

Heeg, Elizabeth Y. Review of *Beyond DNA: How Epigenetics is Transforming our Understanding of Evolution* by Benjamin Oldroyd, *The Reformed Journal*, December 11, 2024.

Heeg, Elizabeth Y. Review of *Not Just for the Boys Why We Need More Women in Science* by Athene Donald, *The Reformed Journal*, October 4, 2023.

Almail, A., Heeg, E., Noordewier, B., and Tolsma, S.S. Exploring a Transcriptional Regulatory Region in Mycobacteriophage JacoRen57. Iowa Academy of Science Annual Meeting (virtual), NWC Celebration of Research and Annual SEA-PHAGES Symposium, 2021.

Heeg, E.Y., Carlson, K., Furlong, L., Noordewier, B., Tolsma, S., Garlena, R.A., Russell, D.A., Pope, W.H., Jacobs-Sera, D. and Hatfull, G.F. Mycobacterium phage Phineas, Complete Genome. <https://www.ncbi.nlm.nih.gov/nuccore/MK820639>, 2019.

Sybesma Tolsma, Sara, Heeg, Elizabeth, and Furlong, Laura. *The Wide, Wild World of Sex*, Perspectives, 32:5, 6-10, September 2017.

Heeg, Elizabeth Y. Review of *The End of Sex and The Future of Human Reproduction* by Henry T. Greely, Perspectives, 68:4, 267, December 2016.

Heeg, Elizabeth Y. Review of *Sex Itself: The Search for Male and Female in the Human Genome* by Sarah S. Richardson, Perspectives, 67:2, 155, January 2015.

Heeg-Truesdell, E, and LaBonne, C (2007). Wnt Signaling in Embryonic Development: Multiple roles for Wnt signaling in the development of the vertebrate neural crest. Paul M. Wasserman [ed.], *Advances in Developmental Biology*, San Diego, California: Elsevier, Pgs. 203-222.

Heeg-Truesdell, E, and LaBonne, C (2006) Neural induction in *Xenopus* requires Wnt-beta-catenin signaling. *Developmental Biology* 298(1):71-86.

Heeg-Truesdell, E, and LaBonne, C (2006) Wnt Signaling: A Shaggy Dogma Tale. *Current Biology* 16(2):62-64.

Heeg-Truesdell and LaBonne, C. (2004). A slug, a fox, a pair of sox: transcriptional responses to neural crest inducing signals. *Birth Defects Res C Embryo Today* 72(2):124-139. Review.

## HONORS AND AWARDS

Sabbatical Award, Northwestern College, Fall 2024  
Teaching Excellence Finalist, Northwestern College, Spring 2024.  
Teaching Excellence Finalist, Northwestern College, Spring 2023.  
Northwestern Scholarship Grant, Summer 2022  
Equipping the Next Generation of Christian Evolutionary Biologists and Paleobiologists Selected conference attendee, Calvin College, MI. June 21-29, 2014 and June 28-July 3, 2015.  
Teaching Excellence Award, Northwestern College, Spring 2010.  
Northwestern Scholarship Grant, Fall 2009.  
Vocare Advising Grant, Northwestern College, Orange City, IA. Spring 2009.  
Summer Research Grant, Northwestern College, Summer 2007.  
CMBD (Cellular and Molecular Basis of Disease) NIH Training Grant, Northwestern University, Fall 2003—Summer 2005.  
Teaching Assistant Fellows Program Award, Northwestern University, Fall 2003.  
Teaching Assistant of the Year Award, Northwestern University, Fall 2003.

## **INSTITUTIONAL SERVICE**

Member, Faculty Status Committee, Northwestern College, Fall 2025—present.  
Faculty Advisor, Northwestern College Pre-Health Professions Club, Fall 2007—Present.  
Faculty Advisor, Northwestern College Red Cross Club, Fall 2025—Present.  
Chair, Academic Affairs Committee, Northwestern College, Fall 2023—Spring 2024.  
Faculty Advisor, Northwestern College Biology Department, Fall 2007—Present.  
Member, Academic Affairs Committee, Northwestern College, Fall 2021—2024.  
Member, Faculty Status Committee, Northwestern College, Fall 2015—Spring 2017.  
Co-Director, Northwestern College Honors Program, Fall 2011—Spring 2016.  
Master of Ceremonies, Northwestern College Ethnic Fair, Spring 2015.  
Faculty Attendee, Iowa Private College Week, Summer 2007, Summer 2012.  
Master of Ceremonies, Northwestern College Ethnic Fair, Spring 2012.  
Member, General Education Task Force, Northwestern College, Fall 2009—Spring 2011.  
Member, Vice President for Advancement Search Committee, Northwestern College, Spring 2009.  
Member, Admissions Retentions and Honors Committee, Fall 2008—Spring 2009.  
Faculty Advisor, Student Government Association, Northwestern College, Fall 2008—Spring 2009.  
Judge, NC/DC Student Activities Event, Northwestern and Dordt Colleges, November 2008.  
Workshop leader, Searle Center for Teaching Excellence, Northwestern University, Evanston, IL, Fall 2002.  
IBiS Student Organization, Social Committee member, 2001-2002.

## **PROFESSIONAL MEMBERSHIPS**

American Association for the Advancement of Science (AAAS).  
Association of American Medical Colleges (AAMC).  
American Society of Biochemistry and Molecular Biology (ASBMB).  
Association for Biology Laboratory Education (ABL).  
Central Association of Advisors for the Health Professions (CAAHP).  
International Association for the Promotion of Christian Higher Education.  
Iowa Academy of Science (IAS).  
National Association of Biology Teachers (NABT).  
National Association for Advisors of Pre Health students (NAAHP).