# Caroline (Lina) Lund Dahlberg, Ph.D.

# **Assistant Professor Curriculum Vitae**

Biology Department Western Washington University Room 306, 516 High Street, Mailstop 9160 Bellingham, WA 98225

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#### **EDUCATION and TRAINING**

Tufts University School of Medicine

Boston, MA 2009-2012

Postdoctoral fellow, Cellular biology and neurobiology

TEACRS (Training in Education and Critical Research Skills) Fellow

University of Washington, Seattle

Doctor of Philosophy, Biochemistry

Seattle, WA 2002-2008

2001-2002

**Århus University** 

Århus, Denmark

Fulbright student, Protein crystallography

Haverford, PA

**Haverford College** Bachelor of Science, Biology, Summa cum laude

1997-2001

Rotary International Exchange Student

Gymnásium Vrchlabí

Vrchlabí, Czech Republic

1996-1997

## **TEACHING**

#### **Assistant Professor of Biology**

Western Washington University, Bellingham, WA

Winter 2014- Current

#### Biology 205 (68-72 students) Winter quarter 2016, Fall quarter, 2014

- Quarter-long seminar course covering Introductory Cell and Molecular Biology
- Designed syllabus, held class three-times weekly, supervised laboratory sections 2x per week, held weekly office hours, wrote and graded online quizzes and in-class exercises and exams.
- This course interweaves traditional lecture style with in-class group work that ensure that students integrate material from lecture, lab, and previous courses.

#### Biology 323 (33-47 students) Fall quarter, 2015; Spring quarter, 2015; Spring quarter, 2014

- Quarter-long seminar course in Cell and Molecular Biology
- Designed syllabus, held class three-times weekly, held weekly office hours, wrote and graded inclass exercises, quizzes, and exams.
- This course made extensive use of guided-inquiring learning exercises during class time. These inclass exercises asked students to derive and apply biological concepts and novel techniques based on material presented in lectures.
- The quarter culminates with a poster presentation of Cell Signaling Pathways by students to their peers and faculty poster judges.

#### Biology 324 (10 students in lab section) Winter quarter, 2014

- Quarter-long seminar course covering Techniques in Molecular Biology
- Updated syllabus, attended pre-lab lectures given by other faculty, presenting three pre-lab lectures. supervised laboratory sections 2x per week, wrote and graded quizzes and exam questions, graded laboratory notebooks.
- This course is focused on introducing students to widely-used molecular biological techniques in a laboratory setting.

#### Biology 486 (9-14 students), Spring quarter, 2016, Winter quarter, 2014 and 2015

Quarter-long seminar course in Developmental Neurobiology

- Designed syllabus, held class twice weekly, held weekly office hours, wrote and graded homework assignments.
- This course was writing intensive (currently counts as writing-proficiency course), and used modeling
  exercises as a way to help students engage with, and better synthesize the findings of, primary
  scientific literature.

### **Adjunct Professor of Biology**

Spring semester, 2011

Pine Manor College, Newton, MA

Biology 490 (19 students)

- Taught semester-long senior seminar in neurobiology for biology majors
- Designed syllabus, held class twice weekly, held weekly office hours, wrote and graded homework assignments and quizzes
- Developed and graded sequential writing assignments, culminating with a final paper and poster presentation
- Incorporated videos, primary literature, clickers, and in-class activities for better student engagement and understanding of the material

#### **Adjunct Professor of Biology**

Spring quarter, 2009

Western Washington University, Bellingham, WA

Biology 205 (65 students)

- Taught a quarter-long course on cell and molecular biology for incoming students
- Designed lectures and syllabus, lectured four times weekly, held weekly office hours, wrote and graded exams
- Supervised laboratory sessions

### Lecturer in Biochemistry

Winter and Spring quarters, 2007

University of Washington Extension, Seattle, WA

Biochemistry 405 and Biochemistry 406 (20 students)

- Co-taught two quarter-long modules on introductory biochemistry for continuing education students
- Designed syllabus, lectured twice weekly, held weekly office hours, wrote and graded homework and exams

#### **Teaching Assistant**

Fall quarter, 2003

University of Washington, Seattle

#### **Biochemistry 426**

 Led pre-laboratory lectures and in-lab sessions on protein biochemistry for the required undergraduate major laboratory course

# **Teaching Assistant**

Winter quarter, 2004

University of Washington, Seattle

#### Biochemistry 406

Held weekly office hours for introductory biochemistry course, designed for non-majors

#### **Teaching Assistant**

Spring quarter, 2004

University of Washington, Seattle

#### **Biochemistry 442**

- Led weekly recitation sessions and wrote and graded quiz questions for the final quarter of seniorlevel biochemistry for majors
- · Graded in-class exams

#### **Teaching Assistant**

Spring semester, 2001

Haverford College, Haverford, PA

#### **Biology 100**

Helped facilitate weekly laboratory sessions for a biology class geared towards non-majors

#### Language teacher and counselor

Summers, 1996-2003

- Concordia Language Villages, Concordia College, Moorhead, MN. (Danish language).
- Two- and four-week language immersion program for children ages 8–18.
- Taught language in small group, large group and individual formats.

#### RESEARCH

Primary Investigator Winter 2014-Current

Western Washington University, Bellingham, WA

• Investigation of cellular mechanisms of neural health and signaling in C. elegans

#### Postdoctoral Associate/TEACRS Fellow

2009-2013

Institutional Research and Academic Career Development Awards (IRACDA)

Funded by NIGMS, National Institutes of Health

Tufts University School of Medicine, Boston, MA

Department of Molecular Physiology and Pharmacology

Advisor: Dr. Peter Juo

• Investigation of cellular mechanisms of neurotransmitter receptor regulation in *C. elegans* 

Doctoral Student 2002-2008

University of Washington, Seattle, WA

Department of Biochemistry

Advisor: Dr. David Kimelman

• Biochemical characterization of interactions between casein kinase 1ε and its protein substrates

Fulbright student 2001-2002

University of Århus, Århus, Denmark

Institut for Molekylær og Struktural Biologi

Advisor: Dr. Poul Nissen

Structure determination of bacterial elongation factor Tu complexed with the antibiotic Enacyloxin IIa

#### **Undergraduate Research**

2000-2001

Haverford College, Haverford, PA

Department of Biology

Advisor: Dr. Robert Fairman

 De novo design of long, self-assembling coiled-coil proteins; characterization of variants of the lac repressor four-helix coiled coil

#### **HHMI Interdisciplinary Scholar**

2000

Univeristy of Wisconsin, Madison, WI

Department of Biochemistry

Advisor: Dr. Ronald Raines

Biochemical analysis of variants of RNAse A

#### **GRANTS and SCHOLARSHIPS**

- 2016 HHMI Inclusive Excellence Grant (pre-proposal), Invited for full proposal (Team written)
- 2016 Summer Research Grant, WWU, Bellingham, WA
- 2016 Social Justice and Diversity Grant, WWU, Bellingham, WA
- 2015 NSF: IUSE grant (under review)
- 2015 Pilot Project Grant, WWU, Bellingham, WA
- 2015 Student Technology Fee Grant, WWU, Bellingham, WA
- 2014 WICB Travel Grant, American Society for Cell Biology
- 2012 Natalie V. Zucker Research Grant, Tufts University, Boston, MA
- 2009 TEACRS Postdoctoral Fellowship, NIH Institutional Research and Academic Career Development Award (K12), Tufts University, Boston, MA
- 2003 Cell and Molecular Biology Training Grant, National Institutes of Health, University of Washington, Seattle
- 2003 Honorable Mention, National Science Foundation Pre-doctoral grant, University of Washington, Seattle
- 2001 Fulbright Student Fellowship, University of Århus, Århus, Denmark
- 2000 Summer: Howard Hughes Medical Institute Interdisciplinary Scholarship, University of Wisconsin, Madison

#### **SCIENTIFIC PUBLICATIONS**

Moss BJ, Park L, **Dahlberg CL**, Juo, P. (Submitted) *The CaM kinase CMK-1 mediates a negative feedback mechanism coupling the C. elegans glutamate receptor GLR-1 with its own transcription.* 

Little, W, Robblee, JP, **Dahlberg, CL,** Kokona, B, Fairman, R. 2015 *Effect of Helix Length on the Stability of the Lac Repressor Antiparallel Coiled Coil*, 2015. Biopolymers Peptide Science.

**Dahlberg CL**, Juo, P. 2014. The WD40 repeat-containing proteins, WDR-20 and WDR-48 bind and activate the deubiquitinating enzyme USP-46 to promote the abundance of glutamate receptors in the ventral nerve cord of C. elegans. Journal of Biological Chemistry 2014 **289** (6):3444-56

Kowalski, JR, **Dahlberg CL**, Juo, P. 2011. The deubiquitinating enzyme USP-46 negatively regulates the degradation of glutamate receptors to control their abundance in the ventral nerve cord of Caenorhabditis elegans. Journal of Neuroscience. **31**(4):1341-54

**Dahlberg CL**, Nguyen EV, Goodlett DR, Kimelman D. 2009. *Interactions between casein kinase*  $1\varepsilon$  *and two substrates from disparate pathways reveal mechanisms for substrate-kinase specificity*. PLoS ONE. **4**(3):e4766

Sampietro, J, **Dahlberg, CL**, Cho, US, Hinds, TR, Kimelman, D, Xu, W. 2006. *Crystal structure of a*  $\beta$ -catenin/BCL9/Tcf4 complex. Molecular Cell. **24**:293-300

Parmeggiani, A, Krab, IM, Watanabe, T, Nielsen, RC, **Dahlberg, C**, Nyborg J, Nissen P. 2006. *Enacyloxin IIa pinpoints a binding pocket of elongation factor Tu for development of novel antibiotics*. Journal of Biological Chemistry **281**:2893-900

Dickson, KA, **Dahlberg**, **CL**, Raines, RT. 2003 *Compensating effects on the cytotoxicity of ribonuclease A variants*. Archives Biochemistry and Biophysics. **415**:172-7.

#### **CONFERENCES**

FASEB SRC "Ubiquitin and Cellular Regulation", Bi-annual meeting, Big Sky, MT, 2016

"Regulation of neurotransmitter receptors by ERAD ubiquitin ligases in C. elegans" (Poster presentation)

\*\*This poster contained data generated by WWU undergraduate and graduate researchers

Northwest Developmental Biology Society, Annual meeting, Friday Harbor, WA, 2016

"Infusing Metacognition during the Process of Science in a Large-Group Introductory Cell and Molecular Biology Course" (Poster Presentation)

\*\*This poster contained data generated by WWU undergraduate and graduate researchers

American Society for Cell Biology, Annual meeting, San Diego, CA, 2015

"Regulation of the glutamate receptor, GLR-1, by ERAD ubiquitin ligases in C. elegans" (Poster presentation)

\*\*This poster contained data generated by WWU undergraduate researchers

UW-Seattle-Kobe Japan joint Symposium on Cell Signaling, Seattle, WA 2015

"ER-based regulation of the Glutamate receptor, GLR-1, in *C. elegans" (Poster presentation by Samuel Witus, undergraduate researcher)* 

\*\*This poster contained data generated by WWU undergraduate researchers

20th International C. elegans Meeting, Los Angeles, CA, 2015

"Ubiquitin-mediated regulation of diverse small-molecule receptors in C. elegans" (Poster presentation)

\*\*This poster contained data generated by WWU undergraduate researchers

American Society for Cell Biology, Annual meeting, Philadelphia, PA, 2014

"Ubiquitin-mediated regulation of diverse small-molecule receptors in C. elegans" (Poster presentation)

\*\*This poster contained data generated by WWU undergraduate researchers

Gordon Research Conference, Cell Biology of the Neuron, Waterville Valley, New Hampshire, 2012.

"The WD40 repeat-containing proteins, WDR-20 and WDR-48 bind and activate the deubiquitinating enzyme USP-46 to promote the abundance of glutamate receptors in the ventral nerve cord of C. elegans" (Poster presentation)

IRACDA National Conference, University of Pennsylvania, Philadelphia, PA, 2012.

"The WD40 repeat-containing proteins, WDR-20 and WDR-48 bind and activate the deubiquitinating enzyme USP-46 to promote the abundance of glutamate receptors in the ventral nerve cord of C. elegans" (Poster presentation)

The Ubiquitin Family, Cold Spring Harbor, New York, 2011.

"The deubiquitinating enzyme USP-46 negatively regulates the degradation of glutamate receptors in the ventral nerve cord of C. elegans" (Poster presentation)

IRACDA National Conference, Baylor College of Medicine, Houston, TX, 2011.

"The deubiquitinating enzyme USP-46 negatively regulates the degradation of glutamate receptors in the ventral nerve cord of C. elegans" (Poster presentation)

Neuronal Development, Synaptic Function and Behavior, C. elegans Topic Meeting,

University of Wisconsin, Madison, WI, 2010 Conference attendee

17<sup>th</sup> International *C. elegans* Meeting, University of California, Los Angeles, CA, 2009 Conference attendee

Keystone Symposium on Wnt signaling, Alta/Snowbird, Colorado, 2006.

"Biochemical interactions in the beta-catenin destruction complex" (Poster presentation)

Wnt Signalling in Development, Disease and Cell Biology, Aberdeen, Scotland, 2005.

"Biochemical characterization of the beta-catenin destruction complex" (Poster presentation)

#### **SEMINARS**

Department of Molecular Biology, Arhus University, 2013.

"Regulation of the glutamate receptor, GLR-1, by a deubiquitinating enzyme complex in C. elegans"

Department of Biology, Assumption College, 2013.

"Sorting the garbage from the recycling: Regulated protein degradation in the nervous system of C. elegans"

Department of Molecular Physiology and Pharmacology, Tufts University School of Medicine, 2012.

"The WD40 repeat-containing proteins, WDR-20 and WDR-48 bind and activate the deubiquitinating enzyme USP-46 to promote the abundance of glutamate receptors in the ventral nerve cord of C. elegans"

Department of Molecular Physiology and Pharmacology, Tufts University School of Medicine, 2011.

"Identification of Ubiquitin signaling components that regulate glutamate receptors in C. elegans"

# STUDENTS MENTORED IN RESEARCH

Alexandra Townsend

Fall 2015-Current

- Graduate Student, Western Washington University
- Thesis project: Investigation of the E2 ligases UBC-6 and UBC-7 in C. elegans

Samuel Witus Fall 2014-Current

- Undergraduate student, Western Washington University
- Introduction to primary research, biochemistry and the C. elegans model system
- Winner-Outstanding Poster Award, Scholars Week, 2016
- Winner-Outstanding Graduating Senior Award, Biology Department, 2016
- · Winner- Sea Bong Chang Memorial Award for Outstanding Biochemist, 2016

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Ellen Zocher Winter 2014-Current

- Undergraduate student, Western Washington University
- Introduction to primary research, cell biology and the *C. elegans* model system *Winner*-Outstanding Poster Award, Scholars Week, 2015

Nelson Ruth Spring 2014-Current

- · Undergraduate student, Western Washington University
- Introduction to primary research, cell biology and the C. elegans model system Winner-Outstanding Poster Award, Scholars Week, 2015

Robert Kendrick Summer, 2016

- Undergraduate student, Western Washington University
- Introduction to primary research, cell biology and the C. elegans model system

Marissa Hogg Summer, 2016

- Undergraduate student, Western Washington University
- Introduction to primary research, cell biology and the C. elegans model system

Alexander Veneruso Summer, 2015

- · Undergraduate student, Western Washington University
- Introduction to primary research, cell biology and the C. elegans model system

Bradley Fulcher Summer, 2015

- Undergraduate student, Western Washington University
- Introduction to primary research, cell biology and the C. elegans model system

Lysander Borrero-Romero, Tufts University, Boston, MA

- Rising sophomore undergraduate student, University of Puerto Rico-Cayey, Puerto Rico
- Introduction to primary research, glutamate receptor biology and the C. elegans model system

Laurel Drane, Tufts University, Boston, MA

Spring 2011

Summer 2012

- · First year graduate rotation student, Tufts University
- Introduction to C.elegans biology and research on the ER uiquitin ligase, hrdl-1

Jen-Wei Huang, University of Washington, Seattle, WA

University of Washington Extension, Seattle, WA, Biochemistry 405 Updated, prepared and presented three lectures on metabolism Fall 2007

2008

- First year graduate rotation student, University of Washington
- Introduction to protein chemistry and characterization of CKIε autophosphorylation

#### **GUEST LECTURES**

Assumption College, Worchester, MA, Biology 102  "Structure and function of the DNA double helix: the people and atoms behind a molecule"  (Two lectures presented)	2011
Pine Manor College, Newton, MA, Biology 101 "Nuclear structure and the central dogma of molecular biology"	2010
Pine Manor College, Newton, MA, Biology 390 "Introduction to neurobiology in the model organism, <i>C. elegans</i> "	2010
Assumption College, Worchester, MA, Biology 102  "Structure and function of the DNA double helix: the people and atoms behind a molecule"  (Two lectures presented)	2010

#### PROFESSIONAL ORGANIZATION MEMBERSHIPS

American Society for Cell Biology	2014-current
Seattle and Vancouver C. elegans meetings	2014-current
Genetics Society of America (GSA)	2009-current
Tufts University Postdoctoral Association	2011-current

SE	RVICE and OUTREACH	
	Panelist  "Career development panel", FASEB SRC "Ubiquitin and Cellular Regulation."	2016
	<b>Host:</b> "Mud Crabs: Scientific research at an Intersection of biology and social stigma." Co-Hosts: Out in Science and Women, Gender and Sexuality Studies.	2016
	Co-facilitator for conversations with graduate students on issues of Diversity and Inclusion	2016
	College of Science and Engineering diversity working group	2016
	Highschool outreach for Biochemistry and Cell Biology Sehome High School students visited the Dahlberg, Antos, and Spiegel laboratories	2015
	Compass-to-Campus Discussed neurobiology and microscopy of <i>C. elegans</i> with 5 <sup>th</sup> graders from Blaine, WA and Sun WA.	2015 nas,
	Highschool outreach and mini-research project. Wild Worms! Sehome High School students isolated wild nematodes for whole-genome sequencing at USF. A Scholarship Statement	2015 Also see,
	Bellingham SPARK Museum radio interview: "The Science of Smell."	2015

#### Bellingham SPARK Museum radio interview: "The Science of Smell."

2015

2015

# **Poster Judge** 20<sup>th</sup> International *C. elegans* meeting

**Guest speaker** 

2014

## Biology Club, Western Washington University

Question and Answer session regarding undergraduate research, study abroad, careers in science, and graduate school.

#### Committee member: Organizing the Big Ideas for Introductory Biology

2014

I worked with Professors Merrill Peterson and Deb Donovan to organize and renovate the main Ideas to be covered by the Introductory Biology series of courses at WWU.

#### 2014 **Guest speaker**

Biology Club, Western Washington University

"Introduction to C. elegans." Informal seminar and open question and answer session regarding carreers in biology and research at the undergraduate level.

Volunteer Judge 2013 Boston Collegiate Charter School, 6<sup>th</sup> Grade science fair. Listened to poster presentations by students, gave constructive feedback, identified outstanding projects.

Chairperson 2012

TEACRS Program. I programmed organizational meetings and TEACRS yearly plan and worked with the TEACRS program directors, secretary and administration assistant. Boston, MA

Volunteer consultant 2012

Morgridge Institute for Research, Committee on Education and Outreach. I introduced my experiences in the TEACRS program and the mission of IRACDA. I also discussed the options for initiating post-doctoral teaching and research options through the Morgridge Institute.

Volunteer member 2011-current

Finance committee, "Directing through Recreation, Education, Adventure, and Mentoring" (DREAM) Program. DREAM helps college students provide year-round mentoring to youth living in low-income housing. I am working with private organizations and corporations to secure funding and grants. Boston, MA

Organizer 2010

Workshop on course design for chemistry and biology. I planned and organized a five-session workshop and discussion group focused on designing new science curricula. Sessions were facilitated by TEACRS trainees and featured Tufts University faculty who are known for their teaching skills. Each trainee prepared a syllabus and objectives for a course that they plan to teach in the future. Tufts University, Boston, MA

#### Curriculum design and presentation

2010

Science Education Partnership Award (SEPA) lecture and planning; topic: *The cellular basis of pain*. SEPA aims to educate high-school teachers on topics of current biomedical science as a way to improve science education in the public schools. I provided curriculum development materials and advice. Boston, MA. Boston Public Schools, in association with the NIH and Tufts University.

#### **Fundraising coordinator**

2010

National IRACDA Conference for all NIH-funded IRACDA trainees. I engaged national and local businesses and organizations for help with funding the national conference, hosted at Tufts University. Tufts University, Boston, MA

#### Organizer and participant

2009-2010

Career panels for undergraduates in the greater Boston area. I participated in panel discussions for students graduating with degrees in biology. (UMass-Boston, Bunker Hill Community College, Pine Manor College). Boston, MA

Volunteer instructor 2006-2008

*A genome in a test-tube.* Edmonds Middle School Career Fairs, Edmonds, WA. I gave a lecture and lead a hands-on laboratory experience for 5<sup>th</sup> and 6<sup>th</sup> grade students in the Edmonds Public Schools.

Volunteer instructor 2006-2008

The Bioscience Experience, An Introduction to Basic Science Research for Underrepresented Minority Students. University of Washington, Seattle, WA. I helped plan and lead day-long laboratory modules for visiting students.

Volunteer instructor 2004-2008

Tours of the University of Washington Medical Center for high school students. University of Washington, Seattle, WA. I gave tours of laboratories and facilities to visiting highschool classes.

Group leader 2003

Bryant Elementary School Science Fair. Seattle, WA. I lead a group of elementary school students in a 6-week science fair experiment; this included helping formulate questions, hypotheses, and experimental designs and aiding in data analysis.

# PROFESSIONAL DEVELOPMENT ACTIVITIES

Problem Based Learning

· Public speaking

Assessment and evaluation

Working group on pedagogy and teaching, WWU Biology and Chemistry	Current		
Workshop on Undergraduate Research at American Society for Cell Biology meeting	Fall 2015		
REIL Biology Workshop on including research in undergraduate courses	Fall 2015		
Research, teaching and tenure workshop at 20 <sup>th</sup> International <i>C. elegans</i> meeting	June 2015		
Change at the Core (C-Core)	Current		
Marketing for scientists	Fall 2013		
Making the most of presentations (Jean Luc Dumond)	Winter 2013		
Grant writing (NSF, R15 focused)	Spring 2013		
Workshop on designing a biology laboratory module	Winter 2012		
Process Oriented Guided Inquiry Learning (POGIL) Workshop	Fall 2011		
Course Design Workshop	Fall 2011		
Responsible Conduct of Research Training	Summer 2011		
Using Case Studies in Science Teaching Dr. Clyde Herreid, Director of the National Center for Case Study Teaching in Science			
<ul> <li>Writing Winning Grants Workshop</li> <li>National Institutes of Health Funding</li> <li>National Science Foundation Funding</li> <li>Private Foundation Funding</li> </ul>			
Writing Scientific Papers Vivian Siegal, PhD, Director of the Center for Science Communication, Vanderbilt University	Fall 2010		
Grant Writing Workshop Daniel Jay, PhD, Professor of Physiology, Tufts University School of Medicine	Spring 2010		
Graduate Institute for Teaching (3 week training program)      Course development and planning     Technology resources     Triggers and hooks     Designing writing assignments     Managing classroom description	ences		

• Use of audience response

Defining a teaching philosophy Effective writing assignment