Erik C. Andersen

Assistant Professor
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Department of Molecular Biosciences

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Research Interest: Understanding the genetic basis of complex traits using high-throughput phenotyping, molecular genetics, and computational tools

Education:

2000 - 2008 Ph.D. in Biology
Massachusetts Institute of Technology (MIT), Cambridge, MA
Advisor: Dr. H. Robert Horvitz
Dissertation: The synthetic Multivulva genes and their suppressors regulate opposing cell fates through chromatin remodeling

1996 - 2000 B.S. in Biological Sciences with departmental honors
Stanford University, Stanford, CA
Advisor: Dr. Matthew P. Scott
Dissertation: *in vivo* analysis of *Drosophila* heart-tube formation

Academic Appointments:

2013 - Assistant Professor of Molecular Biosciences, Northwestern University
Full Member of the Robert H. Lurie Comprehensive Cancer Center
Member of the Chemistry of Life Processes Institute
Preceptor for the Interdisciplinary Biological Sciences Graduate Program
Preceptor for the Northwestern Univ. Interdepartmental Neuroscience Grad. Program

Honors and Awards:

2014 - 2018 Pew Scholar in the Biomedical Sciences
2012 - 2013 Howard Hughes Medical Institute Post-doctoral Fellow
2011 - 2012 National Cancer Institute Post-doctoral Fellow
2009 - 2011 Ruth L. Kirschstein National Research Service Award Recipient
2005 - 2006 Anna Fuller Cancer Research Fellowship
2000 Firestone Medal for Excellence in Undergraduate Research
1999 Howard Hughes Medical Institute Summer Research Fellowship
1998 Howard Hughes Medical Institute Summer Research Fellowship
1998 Stanford University Undergraduate research small grant recipient

Publications: *undergraduate co-authors in italics*, corresponding authors underlined

1. *Shimko TC*, **Andersen EC**. (2014)
COPASutils: an R package for reading, processing, and visualizing data from COPAS large-particle flow cytometers. *Submitted to PLoS ONE*

2. **Andersen EC**, Bloom JS, Gerke JP, Kruglyak L. (2014)
The neuropeptide receptor *npr-1* is a major determinant of *Caenorhabditis elegans* growth and physiology. *PLoS Genetics* 10(2):e1004156

3. Felix MA, Jovelin R, Ferrari C, Han S, Cho YR, **Andersen EC**, Cutter AD, Braendle C. (2013) Species richness, distribution and genetic diversity of *Caenorhabditis* nematodes in a remote tropical rainforest. *BMC Evolutionary Biology* 13(10):

4. Ghosh R, **Andersen EC**, Shapiro JA, Gerke JP, Kruglyak L. (2012) Natural variation in a chloride channel subunit confers avermectin resistance in *C. elegans. Science* 335(6068): 574-578.

5. **Andersen EC*,** Gerke JP*, Shapiro JA*, Crissman JR, Ghosh R, Bloom JS, Felix MA, Kruglyak L. (2012) Chromosome-scale selective sweeps shape *Caenorhabditis elegans* genomic diversity *Nature Genetics* 44(3): 285-290. *equal contribution

6. **Andersen EC**. (2011) PCR-directed *in vivo* plasmid construction using homologous recombination in baker's yeast. *Molecular Methods for Evolutionary Genetics*, 772; 409-421. *Invited book chapter

7. Raj A, Rifkin SA, **Andersen EC**, van Oudenaarden A. (2010) Variability in gene expression underlies incomplete penetrance. *Nature* 463(7283): 913-918.

8. Bessler JB, **Andersen EC**, Villeneuve AB. (2010) Differential localization and independent acquisition of the H3K9me2 and H3K9me3 chromatin modifications in the *Caenorhabditis elegans* adult germ line. *PLoS Genetics* 6(1): e1000830.

9. Reddy KC*, **Andersen EC***, Kruglyak L, and Kim DH. (2009) A polymorphism in *npr-1* is a behavioral determinant of pathogen susceptibility in *C. elegans*. *Science* 323(5912): 382-384. *equal contribution

10. **Andersen EC**, Saffer AM, and Horvitz HR. (2008) Multiple levels of redundant processes inhibit *Caenorhabditis elegans* vulval cell fates. *Genetics* 179(4): 2001-2012.

11. **Andersen EC** and Horvitz HR. (2007) Two *C. elegans* histone methyltransferases repress *lin-3* EGF transcription to inhibit vulval development. *Development* 134(16): 2991-2999.

12. Reddien PW, **Andersen EC**, *Huang M*, and Horvitz HR. (2007) DPL-1 DP, LIN-35 Rb, and EFL-1 E2F act with the MCD-1 Zinc-finger protein to promote programmed cell death in *C. elegans. Genetics* 175(4): 1719-1733.

13. **Andersen EC**, Lu X, and Horvitz HR. (2006) *C. elegans* ISWI and NURF301 antagonize an Rb-like pathway in the determination of multiple cell fates. *Development* 133(14): 2695-2704.

14. Furlong EE, ***Andersen EC***, Null B, White KP, and Scott MP. (2001) Patterns of gene expression during *Drosophila* mesoderm development. *Science* 293(5535): 1629-1633.

In preparation:

1. **Andersen EC**, *Shimko TC*, Crissman JR, Ghosh R, Gerke JP, Seidel HS, Kruglyak L. (2014)
   A powerful new quantitative genetics platform using *C. elegans* high-throughput fitness assays combined with a large collection of recombinant strains.

Presentations:

Invited departmental seminars and conference presentations:

2014 Biology Department, Marquette University, Milwaukee, WI
Pharmacogenomics group, University of Chicago, Chicago, IL
2013 Quantitative genetics workshop, 19th International *C. elegans* meeting, UCLA, Los Angeles, CA
2012 Molecular Bioscience Department, Northwestern University, Evanston, IL
Program in Systems Biology, University of Massachusetts Medical School, Worcester, MA
Biology Department, Dartmouth University, Hanover, NH
Human Genetics Department and Life Sciences Institute, University of Michigan, Ann Arbor, MI
Genetics Department, University of Georgia, Athens, GA
Biology Department, Case Western Reserve University, Cleveland, OH
Biology Department and BioDesign Institute, Arizona State University, Phoenix, AZ
Center for Computational and Integrated Biology, Rutgers University, Camden, NJ
Biology Department, University of Florida, Gainesville, FL
2011 Evolution workshop, 18th International *C. elegans* meeting, UCLA, Los Angeles, CA
Laboratory of Toxicology, NIEHS, Research Triangle Park, NC
2010 Institute for Evolutionary Biology Department, University of Edinburgh, Edinburgh, UK
2008 Featured talk at *C. elegans* Aging, Stress, and Pathogenesis meeting, Madison, WI
2000 Undergraduate research symposium, Stanford University, Stanford, CA

Contributed presentations: (*selected for oral presentation)

2013 *19th International *C. elegans* meeting, UCLA, Los Angeles, CA
Society for Molecular Biology of Evolution, Chicago, IL
2012 *Evolutionary biology of *Caenorhabditis* and other nematodes meeting, CSHL, NY
2011 *18th International *C. elegans* meeting, UCLA, Los Angeles, CA
18th International *C. elegans* meeting (poster), UCLA, Los Angeles, CA
2010 *Evolutionary biology of *Caenorhabditis* and other nematodes meeting, Hinxton, UK
Evolutionary biology of *Caenorhabditis* and other nematodes meeting (poster), Hinxton, UK
Cold Spring Harbor Labs Automated Imaging and High-throughput Phenotyping, CSHL, NY
2009 *17th International *C. elegans* meeting, UCLA, Los Angeles, CA
Gordon Research Conference on Quantitative Genetics and Genomics, Galveston, TX
2007 Department of Biology Annual Retreat, MIT, ** poster prize winner
2006 *C. elegans* Evolution and Development meeting, Univ. of Wisconsin, Madison, WI
2005 *15th International *C. elegans* meeting, UCLA, Los Angeles, CA
Chromatin Structure and Function meeting, Nassau, Bahamas
2004 East Coast *C. elegans* meeting, Yale, New Haven, CT
2003 *14th International *C. elegans* meeting, UCLA, Los Angeles, CA
2002 East Coast *C. elegans* meeting, University of New Hampshire, Durham, NH

Grants and Fellowships:

Pending:

2014 March of Dimes Basil O'Connor Starter Research Grant

Identification of hookworm anthelmintic resistance genes to ameliorate maternal and infant anemia

Awarded:

2014 - 2018 National Institutes of Health [1 R01 GM107227]
Direct determination of the distribution of fitness effects of spontaneous mutations
consortium PI ($360,000) with Dr. Charlie Baer (University of Florida)

2014 - 2018 Pew Charitable Trust, Scholars Program in the Biomedical Sciences
Elucidating the genetics of anthelmintic resistance in nematode-borne neglected tropical diseases
PI ($240,000)

2014 - 2016 Chicago Biomedical Consortium, Catalyst Grant
Uncovering "missing heritability" in an experimentally tractable model organism
co-PI ($120,000) with Dr. Ilya Ruvinsky (University of Chicago)

2013 - 2014 American Cancer Society, Institutional Research Grant [93-037-18]
Elucidating the genetic causes of variation in chemotherapy-based toxicity
PI ($30,000)

2013 - 2014 Chemistry of Life Processes, Chairman's Innovation Award
Using perturbations of heavy metal homeostasis to treat nematode-borne neglected tropical diseases
Co-PI ($28,000) with Dr. Thomas O'Halloran (Northwestern)

Teaching and Mentoring:

Courses:

2015 Genetic Analysis (Prog. in Biological Sciences 394-0, Spring, 25-30 students expected)
2014 *Guest Lecture:* Eukaryotic Molecular Biology (IBiS402, 16 students) - *Quant. genetics*
Computational Biology Bootcamp (IBiS, 16 students)
Guest Lecture: IBiS BioEthics class (IBiS423, 41 students) - *Ethics of peer review*
2013 *Guest Lecture:* Eukaryotic Molecular Biology (IBiS402, 24 students) - *Quant. genetics*

Mentoring:

Post-doctoral:

Mostafa Zamanian (2014 -), Ph.D. from Iowa State University, advisor Dr. Timothy Day
Funded by the Bill and Melinda Gates Foundation
Bryn Gaertner (2014 -), Ph.D. from University of Oregon, advisor Dr. Patrick Phillips

Graduate:

Daniel Cook (2014 -), Ph.D. student, Driskill Graduate Program
Funded by a National Science Foundation Pre-doctoral Fellowship
Stefan Zdraljvic (2014 -), Ph.D. student, Interdisciplinary Biological Sciences Program
Lucie Bastin-Heline (2014), Master's exchange student, Ecole Normale Superior, Paris, France

Additional graduate rotation students:
Alex Karge (Spring, 2014), IBiS
Saiorse McSharry (Winter, 2014), IBiS
Amy Nilles (Fall, 2013), IBiS
Ian Wolff (Summer, 2013), IBiS

Undergraduate:
Tyler Shimko (summers 2012, 2013, 2014, University of Utah Class of 2015), Biology Major
Barry Goldwater Scholarship, *Myriad Academic Scholarship*,
Thomas Verender Hanks Scholarship
Mazeed Aro-Lambo (2014 - , Class of 2017), Biological Sciences Major
2014 NU Bioscientist Summer Grant recipient
Stevie Hippleheuser (2014 - , Class of 2017), Biological Sciences Major
2014 Weinberg College Summer Grant recipient
Hillary Tsang (2013 - , Class of 2016), Biological Sciences Major
2014 Summer URO recipient
Lautaro Clienti (2013 - , Class of 2017), Mechanical Engineering Major
Kreena Patel (2013 - , Class of 2015), Biological Sciences and Psychology Double Major
Zifan Xiang (2014 - , Class of 2016), Biomedical Engineering Major
Stephen Chan (2013 - 2014, Class of 2014), Computer Science Major
2013 Summer URO recipient

K-12 lab experiences:
Jacob Cruger, Latin School of Chicago (summers 2013, 2014)
Gina Liu, Illinois Math and Science Academy (2013-2014 academic year)

Ph.D. Thesis committee memberships:
Arianne Rodriguez (advisor, Yun Wang), 2014 -
Nick Timkovich (advisor, Luis Amaral), 2014 -
Aaron Sue (advisor, Rick Morimoto), 2014 -
Ritika Giri (advisor, Richard Carthew), 2013 -
Lilien Voong (advisor, Alec Wang), 2013 -

Service:

Professional:

2014	Panelist, NUIN Post-doc Association, *Interviews and Start-up packages*
	Poster judge, Undergraduate Research Symposium
	Panelist, Pathways to the Professoriate, *How to prepare for a job interview?*
2013	Poster judge, Undergraduate Research Symposium
	Panelist, Bioscientist Freshman seminar; *How to find a research lab?*
	Poster judge, 19th International *C. elegans* meeting - Evolution and Genomics section

Departmental:

2014	Co-chair, IBiS Retreat organizing committee
	Qualifying examination committee (Nick Timkovich, Amaral lab)
	Qualifying examination committee (Aaron Sue, Morimoto lab)
	Qualifying examination committee (Arianne Rodriguez, Wang lab)
2013 - 2014	IBiS Graduate student admissions committee
2013	Qualifying examination committee (Lilien Voong, Wang lab)
	Qualifying examination committee (Ritika Giri, Carthew lab)

Reviewing activity: Academic Journals

Biological Journal of the Linnean Society
Cell
Development
EMBO
Genes and Development
Genetics
Genome Research
Heredity
Nature
Nature Scientific Reports
Nature Genetics
PLoS Genetics
PLoS ONE
PNAS
Science

Membership in Professional Societies:

Genetics Society of America, member
Society of Molecular Biology and Evolution, member

Synergistic Activities and Outreach:

K-12 Outreach

2014	Co-organized with Jacob Cruger nematode collections with the Punahou School, Hawaii
2009	Organized nematode collections with Vassalboro Community School, Maine