



Erik C. Andersen

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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:

- 2008 - 2013 Post-doctoral fellow
Princeton University, Princeton, NJ
Advisor: Dr. Leonid Kruglyak
- 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 (CLP)
Preceptor for the Interdisciplinary Biological Sciences Graduate Program (IBiS)
Preceptor for the Northwestern Univ. Interdepartmental Neuroscience Grad. Program (NUIN)
- 2014 - Member of Northwestern Institute on Complex Systems (NICO)

Honors and Awards:

- 2015 - 2019 American Cancer Society Research Scholar
2015 - 2017 March of Dimes Basil O'Connor Research Scholar
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, 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. Sterken MG, Snoek LB, Kammenga JE, **Andersen EC**. (2015)
The laboratory domestication of *C. elegans*.
Trends in Genetics Mar; 31(5) 224-231
2. Thompson OA, Snoek LB, Nijveen H, Sterken MG, Volkers RJM, Brenchley R, van't Hof A, Bevers RPJ, Cossins AR, Yanai I, Hajnal A, Schmid T, Perkins JD, Spencer D, Kruglyak L, **Andersen EC**, Moerman DG, Hillier LW, Kammenga JE, Waterston RH. (2015)
Remarkably divergent regions punctuate the genome assembly of the *Caenorhabditis elegans* Hawaiian strain CB4856.
Genetics May 19
3. **Andersen EC**, Shimko TC, Crissman JR, Ghosh R, Gerke JP, Seidel HS, Kruglyak L. (2015)
A powerful new quantitative genetics platform combining *Caenorhabditis elegans* high-throughput fitness assays with a large collection of recombinant strains.
G3 Mar 13; 5(5) 911-920
4. Farhadifar R, Baer CF, Valfort AC, **Andersen EC**, Muller-Reichert T, Delattre M, Needleman DJ. (2015)
Scaling, Selection, and Evolutionary Dynamics of the Mitotic Spindle.
Current Biology Mar 16; 25(6) 732-740
5. Balla K, **Andersen EC**, Kruglyak L, Troemel E. (2015)
A wild *C. elegans* strain has enhanced epithelial immunity to a natural microsporidian parasite.
PLoS Pathogens Feb 13; 11(2)e1004583
6. Etienne V*, **Andersen EC***, Ponciano JM, Blanton D, Cadavid A, Joyner-Matos J, Matsuba C, Tabman B, Baer CF. (2015)
The Red Death Meets the Abdominal Bristle: Polygenic Mutation for Susceptibility to a Bacterial Pathogen in *Caenorhabditis elegans*. *Evolution* Feb; 69(2) 508-519
*equal contribution
7. Shimko TC, **Andersen EC**. (2014)
COPASutils: an R package for reading, processing, and visualizing data from COPAS large-particle flow cytometers. *PLoS One* Oct 20; 9(10):e111090
8. **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* Feb; 10(2):e1004156
9. Felix MA, Jovelín 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(1), 10
10. 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.
11. **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

12. **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
13. Raj A, Rifkin SA, **Andersen EC**, van Oudenaarden A. (2010)
Variability in gene expression underlies incomplete penetrance. *Nature* 463(7283): 913-918.
14. 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.
15. 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
16. **Andersen EC**, Saffer AM, and Horvitz HR. (2008)
Multiple levels of redundant processes inhibit *Caenorhabditis elegans* vulval cell fates. *Genetics* 179(4): 2001-2012.
17. **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.
18. 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.
19. **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.
20. 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.

Presentations

Invited departmental seminars and conference presentations:

- 2015 Evolution seminar series, University of Wisconsin, Madison, WI
Department of Biology, Johns Hopkins University, Baltimore, MD
Department of Biology, University of Maryland, College Park, MD
Quantitative genetics workshop, 20th International *C. elegans* meeting, UCLA, Los Angeles, CA
Michigan Area Worm Meeting, van Andel Institute, Grand Rapids, MI
- 2014 Northwestern Institute on Complex systems, Northwestern University, Evanston, IL
Fondation de Treilles: Revisiting the roles of phenotypic plasticity in evolution, Provence, France
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

- 2012 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)

- 2015 *Bridging the divide, 20th International *C. elegans* meeting, UCLA, Los Angeles, CA
- 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

Awarded:

- 2015 - 2019 American Cancer Society Research Scholar Grant
Elucidating the genetic causes of variation in chemotherapy-based toxicity
PI (\$787,658)
- 2015 - 2017 March of Dimes Basil O'Connor Starter Research Grant
Identification of hookworm anthelmintic resistance genes to ameliorate maternal and infant anemia
PI (\$150,000)
- 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 PI 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

Courses:

- 2015 Genetic Analysis (Prog. in Biological Sciences 393, Spring, 12 students)
Guest Lecture: IBiS BioEthics class (IBiS423, 41 students) - *Ethics of peer review*
- 2014 *Guest Lecture:* Eukaryotic Molecular Biology (IBiS402, 16 students) - *Quantitative genetics*
 Computational Biology Bootcamp (IBiS, 16 students) - *Command-line utilities and R*
www.GitHub.com/AndersenLab/IBiS-Bootcamp
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:

- Shannon Brady (2015 -), Ph.D. student, Interdisciplinary Biological Sciences Program
- Daniel Cook (2014 -), Ph.D. student, Driskill Graduate Program
Funded by a National Science Foundation Pre-doctoral Fellowship
- Stefan Zdravljic (2014 -), Ph.D. student, Interdisciplinary Biological Sciences Program
Funded by the Cell and Molecular Basis of Disease NIH Training grant
- Lucie Bastin-Heline (2014), Master's exchange student, Ecole Normale Superior, Paris, France

Additional graduate rotation students:

- Ryan Abdella (Winter, 2015), IBiS
- Erin Baker (Fall, 2014), IBiS
- Alex Karge (Spring, 2014), IBiS
- Saiorse McSharry (Winter, 2014), IBiS
- Amy Nilles (Fall, 2013), IBiS
- Ian Wolff (Summer, 2013), IBiS

Undergraduate:

- Nicholas Irons (2015 - , Class of 2018), Biological Sciences Major
2015 Summer URG recipient
- Annika Zhang (2014 - , Class of 2018), Biological Sciences Major
2015 Weinberg College Summer Grant recipient

Tyler Shimko (summers 2012, 2013, 2014, 2015, University of Utah Class of 2015), Biology Major
Barry Goldwater Scholarship, Myriad Academic Scholarship, Thomas Verender Hanks Scholarship
National Science Foundation Graduate Research Fellowship Recipient
Department of Energy Computational Science Graduate Fellowship Honorable Mention

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
2015 Summer URG recipient
2014 Weinberg College Summer Grant recipient

Hillary Tsang (2013 - , Class of 2016), Biological Sciences Major
2015 Weinberg College Summer Grant recipient
2014 Summer URG recipient, 2014 Academic URG recipient

Lautaro Clienti (2013 - 2015, Class of 2017), Mechanical Engineering Major
2014 Academic URG recipient

Kreena Patel (2013 - 2015, Class of 2015), Biological Sciences and Psychology Double Major
2014 Academic URG recipient, 2015 Emmanuel Margoliash Prize for Basic Research,
Winfred Hill Award, James Alton James Scholar, Ellen Taus Scholarship, J.G. Nolan Scholarship

Zifan Xiang (2014 - 2015, Class of 2015), Biomedical Engineering Major

Stephen Chan (2013 - 2014, Class of 2014), Computer Science Major
2013 Summer URG recipient

K-12 lab experiences:

Matteo di Bernardo, Evanston Township High School (summer 2015)
 Lauren Mann, Oak Park and River Forest High School (2014-2015 academic year)
 Jacob Cruger, Latin School of Chicago (summers 2013, 2014)
 Gina Liu, Illinois Math and Science Academy (2013-2014 academic year)

Masters Thesis committee memberships:

Kristen Larrichia (advisor, Nyree Zerega – Program in Plant Biology and Conservation), 2014 - 2015
 Nick Timkovich (advisor, Luis Amaral) 2015

Ph.D. Thesis committee memberships:

Adam Hockenberry (advisor, Luis Amaral) 2015 -
 Rachel Bakker (advisor, Rich Carthew) 2015 -
 Joseph Muldoon (advisors, Neda Bagheri and Josh Leonard) 2015 -
 Sarah Stainbrook (advisor, Keith Tyo) 2015 -
 Timothy Toby (advisor, Neil Kelleher) 2015 -
 Rose Njoroge (advisor, Sarki Abdulkadir – Driskill Graduate Prog., Feinberg School of Medicine), 2014 -
 Keila Torre-Santiago (advisor, Sadie Wignall) 2014 -
 Aaron Sue (advisor, Rick Morimoto), 2014 -
 Arianne Rodriguez (advisor, Yun Wang), 2014 (Transferred to DGP)
 Ritika Giri (advisor, Richard Carthew), 2013 -
 Lilien Voong (advisor, Alec Wang), 2013 -

Service

Ongoing:

2014 - Editorial Board Member for Trends in Genetics

Professional:

- 2015 Organizing committee for the 20th International *C. elegans* meeting
 Poster judge, 20th International *C. elegans* meeting - Evolution and Genomics section
 Genetics Soc. of America Mentor Lunch, *Postdoc search*, 20th International *C. elegans* meeting
- 2014 Panelist, NUIN Post-doc Association, *Interviews and Start-up packages*
 Poster judge, Northwestern Undergraduate Research Symposium
 Panelist, Pathways to the Professoriate, *How to prepare for a job interview?*
- 2013 Poster judge, Northwestern 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:

- 2015 Qualifying examination committee (Rachel Bakker, Carthew lab)
 Qualifying examination committee, Chair (Joseph Muldoon, Bagheri and Leonard labs)
 Qualifying examination committee (Sarah Stainbrook, Tyo lab)
 Qualifying examination committee (Timothy Toby, Kelleher lab)
- 2014 Departmental Program Review committee
 IBiS Graduate Admissions committee
 Co-chair, IBiS Retreat committee
 Qualifying examination committee (Aaron Sue, Morimoto lab)
 Qualifying examination committee (Arianne Rodriguez, Wang lab)
 Qualifying examination committee (Kristen Larrichia, Zerega lab)
- 2013 IBiS Graduate Admissions committee
 Qualifying examination committee (Lilien Voong, Wang lab)
 Qualifying examination committee (Ritika Giri, Carthew lab)

Reviewing activity: Academic Journals

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

Reviewing activity: Grants and fellowships

- 2014 *Ad hoc* reviewer for Human Frontiers Science Program
- 2014 *Ad hoc* reviewer for National Science Foundation CREST Awards

Membership in Professional Societies:

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

Synergistic Activities and Outreach**K-12 Outreach**

- 2015 Hosted 80 5th grade students from Lincolnwood Elementary School for a day of science
- 2015 - Mentored Matteo di Bernardo from Evanston Township High School on anthelmintic sensitivity
- 2014 Mentored Lauren Mann from Oak Park and River Forest High School on iodine sensitivity
- 2014 Co-organized with Jacob Cruger nematode collections with the Punahou School, Hawaii
- 2013, 2014 Mentored Jacob Cruger from Latin School of Chicago
- 2009 Organized nematode collections with Vassalboro Community School, Maine