

**David S. Fay**  
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## EDUCATION

**1995** Ph.D., Yale University, Molecular Biophysics and Biochemistry  
**1988** B.S., Tufts University, Chemistry

## ACADEMIC POSITIONS

**2001–Present** Assistant, Associate, Full Professor, Molecular Biology, U. of Wyoming  
**1997–2001** Postdoctoral Fellow, University of Colorado, Boulder & HHMI  
**1996–1997** Postdoctoral Fellow, Johns Hopkins University

## EXTRAMURAL SUPPORT (2001–present: Total funds as named PI >\$16M)

### Current

- 2020–2025 National Institutes of Health (P20 GM103432) (Fay Associate Director)**
- Wyoming IDEA Networks for Biomedical Research Excellence (INBRE)
  - Associate Director of the Wyoming INBRE
  - Total costs: ~\$18M/5 years
- 2020–2025 National Institutes of Health DRPP (P20 GM103432) (Fay PI)**
- Wyoming IDEA Networks for Biomedical Research Excellence (INBRE)
  - Director of the Developmental Research Project Program (DRPP)
  - Total costs: ~\$4,817,220/5 years
- 2020–2025 National Institutes of Health (R35 GM136236) (Fay, PI)**
- In vivo regulation of the extracellular matrix
  - Total costs: ~\$2,680,870/5 years

### Previous

- 2016–2020 National Institutes of Health (NIH) (GM066868) (Fay, PI)**
- “Characterizing Novel Functions of Conserved NIMA Family Kinases”
  - Total costs: \$1,697,343
- 2017–2020 National Institutes of Health (NIH) (GM125091) (Fay, PI)**
- “Mechanisms controlling tissue morphogenesis, architecture, and the response to mechanical forces in *C. elegans*”
  - Total costs: \$1,363,000
- 2015–2019 National Institutes of Health DRPP (P20 GM103432) (Fay PI)**
- Wyoming IDEA Networks for Biomedical Research Excellence (INBRE)

- Director of the Developmental Research Project Program (DRPP)
  - Total costs: \$4,817,420/year
- 2010–2015 National Institutes of Health (NIH) R01 GM066868-06 (Fay, PI)**
- “Developmental Functions of Rb Family Proteins”
  - Total costs: \$1,130,240
- 2013–2014 National Institutes of Health/INBRE (P20 GM103432)**
- Total costs: \$29,000
- 2012–2013 National Institutes of Health/INBRE (P20 GM103432)**
- Total costs: \$29,000
- 2011–2011 National Institutes of Health/INBRE (P20 RR016474)**
- Total costs: \$27,000
- 2010–2011 National Institutes of Health (NIH) R01 GM066868-05S2 (Fay, PI)**
- “Developmental Functions of Rb Family Proteins”
  - Total costs: \$72,000
- 2009–2010 National Institutes of Health (NIH) R01 GM066868-05S1 (Fay, PI)**
- “Developmental Functions of Rb Family Proteins”
  - Total costs: \$131,084
- 2004–2010 National Institutes of Health (NIH) R01 GM066868-05 (Fay, PI)**
- “Developmental Functions of Rb Family Proteins”
  - Total costs: \$1,194,000
- 2009–2010 National Institutes of Health/INBRE (P20RR016474)**
- Total costs: \$20,000
- 2005–2008 National Institutes of Health/INBRE (RR016474)**
- “A novel genetic approach for elucidating glycopeptide hormone functions and effectors”
  - Total costs: \$120,000
- 2003–2007 American Cancer Society (ACS) RSG-03-035-01-DDC (Fay, PI)**
- “The Retinoblastoma Protein in *C. elegans*”
  - Total costs: \$799,000

**PEER REVIEWED PUBLICATIONS (60 total; 1991–present)**

**MyNCBI:** <https://www.ncbi.nlm.nih.gov/myncbi/david.fay.1/bibliography/public/>

**Google:** [https://scholar.google.com/citations?hl=en&user=hrL1q1oAAAAJ&view\\_op=list\\_works&sortby=pubdate](https://scholar.google.com/citations?hl=en&user=hrL1q1oAAAAJ&view_op=list_works&sortby=pubdate)

**PRIMARY RESEARCH (40 total)**

Boopathi Balasubramaniam, Irini Topalido, Melissa Kelley, Sarina B. Meadows, Owen Funk, Michael Ailion, and David S. Fay\* (2023). Effectors of anterior morphogenesis in *C. elegans* embryos. *Biology Open*. Jun 22:bio.059982. doi: 10.1242/bio.059982. PMID: 37163004

Braveen B. Joseph, Naava Naslavsky, Shaonil Binti, Sylvia Conquest, Lexi Robison, Ge Bai, Rafael O. Homer, Barth D. Grant, Steve Caplan and David S. Fay\* (2023). Conserved NIMA kinases regulate multiple steps of endocytic trafficking. *PLoS Genetics*. doi: org/10.1371/journal.pgen.1010741. eCollection 2023 April. PMID: 37099601

Braveen B. Joseph, Philip T. Edeen, Sarina Meadows, Shaonil Binti and David S. Fay\* (2022). An unexpected role for the conserved ADAM family metalloprotease ADM-2 in *Caenorhabditis elegans* molting. *PLoS Genetics*. 2022 May 31;18(5):e1010249. doi: 10.1371/journal.pgen.1010249. eCollection 2022 May. PMID: 35639786

Shaonil Binti, Rosa Melinda, Phil Edeen, Sam D. Miller, Braveen B. Joseph, and David S. Fay\* (2022). A life cycle alteration can correct defects in molting. *Dev. Biol.* 481:143-156. PMID: 35038442

Stephanie Grimbert, Karina Mastronardi, Ryan Christensen, Christopher Law, K. Zardoui, David S. Fay, and Alisa Piekny (2021). Multi-tissue patterning drives anterior morphogenesis of the *C. elegans* embryo. *Dev. Biol.* 471:49-64. PMID: 33309948

Braveen B. Joseph, Yu Wang, Phil Edeen, Vladimir Lažetić, Barth D. Grant and David S. Fay\* (2020). Control of clathrin-mediated endocytosis by NIMA family kinases. *PLoS Genetics*. 2020 Feb 18;16(2):e1008633. doi: 10.1371/journal.pgen.1008633. eCollection 2020 Feb. PMID:32069276

Julian Poush, Nicolas A. Blouin, Kristin R. Di Bona, Vladimir Lažetić, and David S. Fay\* (2018). Regulation of germ cell development by ARI/HHARI family ubiquitin ligases. *Scientific Reports* 2018 Dec 10;8(1):17737. doi: 10.1038/s41598-018-35691-y. PMID: 30531803

Vladimir Lažetić, Braveen B. Joseph, Sarina M. Bernazzani, and David S. Fay\* (2018). Actin organization and endocytic trafficking are controlled by a network linking NIMA-related kinases to the CDC-42–SID-3/ACK1 pathway *PLoS Genet.* 2018 Apr 2;14(4):e1007313. doi: 10.1371/journal.pgen.1007313. PMID: 29608564.

Braveen B. Joseph, Nicolas A. Blouin, and David S. Fay\* (2018). Use of a Sibling Subtraction Method (SSM) for Identifying Causal Mutations in *C. elegans* by Whole-Genome Sequencing. *G3: Genes, Genomes, Genetics*, 6, 669–678. PMID: 29237702. Article chosen as issue highlight 2018 and for Spotlight publication for 2019.

Katja K. Dove, Hilary A. Kemp, Kristin Di Bona, Luke J. Milburn, David Camacho, David S. Fay, Dana L. Miller, Rachel E Klevit (2017). Two functionally distinct E2/E3 pairs coordinate sequential ubiquitination of a common substrate in *C. elegans* development. *PNAS*, 114, E6576–E6584. PMID: 28739890.

Vladimir Lazetic and David S. Fay\* (2017). Conserved ankyrin repeat proteins and their NIMA kinase partners regulate extracellular matrix remodeling and intracellular trafficking in *Caenorhabditis elegans*. *Genetics*, 205, 273–293. PMID: 27799278

Melissa Kelley, John Yochem, Michael Krieg, Andrea Calixto, Maxwell G. Heiman, Aleksandra Kuzmanov, Vijaykumar Meli, Martin Chalfie, Miriam B. Goodman, Shai Shaham, Alison Frand, and David S. Fay\* (2015). FBN-1, a fibrillin-related protein, is required for resistance of the

epidermis to mechanical deformation during *C. elegans* embryogenesis. *eLife*, Mar 12;4. <http://elifesciences.org/content/4/e0656>. PMID: 25798732. *F1000 recommended*.

John Yochem, Vladimir Lazetic, Leslie R. Bell, Lihsia Chen, and David S. Fay\* (2015). *C. elegans* NIMA-related kinases NEKL-2 and NEKL-3 are required for the completion of molting. *Dev. Biol.* 398, 255-266. PMID: 25523392

Aleksandra Kuzmanov, John Yochem and David S. Fay\* (2014). Analysis of PHA-1 reveals a limited role in pharyngeal development and novel functions in other tissues. *Genetics*, 198, 259–268. PMID: 25009149

Aleksandra Kuzmanov, Evguenia I. Karina, Natalia V. Kirienko, and David S. Fay\* (2014) The conserved PBAF nucleosome remodeling complex mediates the response to stress in *C. elegans*. *Mol Cell. Biol.* 34, 1121–1135. PMID: 24421384

Stanley R.G. Polley, Aleksandra Kuzmanov, Jujaio Kuang, Jonathan Karpel, Vladimir Lazetic, Evguenia I. Karina, Bethany L. Veo, Aleksandra Kuzmanov, David S. Fay\* (2014). Implicating SCF complexes in organogenesis in *C. elegans*, *Genetics* 196, 211–223. PMID: 24214340

Stanley R. G. Polley and David S. Fay\* (2012). A network of genes antagonistic to the LIN-35 retinoblastoma protein of *C. elegans*. *Genetics* 191, 827–843. PMID: 22542970 *F1000 recommended*.

David S. Fay\*, Stanley R.G. Polley, Jujaio Kuang, Aleksandra Kuzmanov, James W. Hazel, Kumaran Mani, Bethany L. Veo, and John Yochem (2012). A regulatory module controlling pharyngeal development and function in *C. elegans*. *Genetics* 191, 1367–1380. PMID: 22542967

Michelle Sait, Olga Kamneva, David S. Fay, Natalia V. Kirienko, James Polek, Mimi M. Shirasu-Hiza, Naomi L. Ward\* (2011). Genomic and Experimental Evidence Suggests that *Verrucomicrobium spinosum* Interacts with Eukaryotes. *Frontiers in Microbiology*, 2, 211. PMID: 22022322

Natalia V. Kirienko and David S. Fay\* (2010). SLR-2 and JMJC-1 regulate an evolutionarily-conserved stress-response network. *EMBO. J.* 29, 727–739. PMID: 20057358 *F1000 recommended*.

Kumaran Mani and David S. Fay\* (2009). A Mechanistic Basis for the Coordinated Regulation of Pharyngeal Morphogenesis in *C. elegans* by LIN-35/Rb and UBC-18-ARI-1. *PLoS Genetics*. Vol 5 issue 6, e1000510. PMID: 19521497

Natalia V. Kirienko, John David McEnerney, and David S. Fay\* (2008). Coordinated regulation of intestinal functions in *C. elegans* by LIN-35/Rb and SLR-2. *PLoS Genetics*. Vol. 4 issue 4, e1000059. PMID: 18437219

Natalia V. Kirienko and David S. Fay\* (2007). Transcriptome profiling of the *C. elegans* Rb ortholog reveals diverse developmental roles. *Dev. Biol.* 305, 674–684. PMID: 17368442

Saeyoull Cho, Katherine W. Rogers, and David S. Fay\* (2007). The *C. elegans* glycopeptide hormone receptor ortholog, FSHR-1, regulates germline differentiation and survival. *Curr. Biol.* 17, 203–212. PMID: 1726913 *F1000 recommended*.

Aaron M. Bender, Natalia V. Kierienko, Sara K. Olson, B.S. Jeffery D. Esko, and David S. Fay\* (2007). *lin-35/Rb* and the CoREST ortholog *spr-1* coordinately regulate vulval morphogenesis and gonad development in *C. elegans*. *Dev. Biol.* 302, 448–462. PMID: 17070797

Xiaohui Qiu and David S. Fay\* (2006). ARI-1, an RBR family ubiquitin ligase, functions with UBC-18 to regulate pharyngeal development in *C. elegans*. *Dev. Biol.* 291, 239–349. PMID: 16457801

Aaron M. Bender, Orion Wells and David S. Fay\* (2004). *lin-35/Rb* and *xnp-1/ATR-X* function redundantly to somatic gonad development in *C. elegans*. *Dev. Biol.* 273, 335–349. PMID: 15280233

Mingxue Cui, David S. Fay and Min Han\* (2004). *lin-35/Rb* cooperates with the SWI/SNF complex to control *Caenorhabditis elegans* larval development. *Genetics* 167, 1177–1185. PMID: 15280233

David S. Fay\*, Xiaohui Qiu, Edward Large, Christopher P. Smith, Susan Mango and Bethany L. Johanson (2004). The coordinate regulation of pharyngeal development in *C. elegans* by *lin-35/Rb*, *pha-1*, and *ubc-18*. *Dev. Biol.* 271, 11–25. PMID: 15196946

David S. Fay\*, Edward Large, Min Han, and Monica Darland (2003). *lin-35/Rb* and *ubc-18*, an E2 ubiquitin-conjugating enzyme, function redundantly to control pharyngeal morphogenesis in *C. elegans*. *Development* 130, 3319–3330. PMID: 12783801

David S. Fay\*, Sean Keenan, and Min Han\* (2002). *fzr-1* and *lin-35/Rb* function redundantly to control cell proliferation in *C. elegans* as revealed by a nonbiased synthetic screen. *Genes Dev.* 16, 503–517. PMID: 11850412 *F1000 recommended*.

David S. Fay and Min Han (2000). Mutations in *cye-1*, a *Caenorhabditis elegans* cyclin E homolog, reveal coordination between cell-cycle control and vulval development. *Development* 127, 4049–4059. PMID: 10952902

David S. Fay, Heather M. Stanely, Min Han and William B. Wood (1999). A *C. elegans* homologue of *hunchback* is required for late stages of development but not early embryonic patterning. *Dev. Biol.* 205, 240–253. PMID: 10748467

David S. Fay, Amy Fluet, Carolyn J. Johnson and Christopher D. Link (1998). *In vivo* aggregation studies of  $\beta$ -amyloid peptide variants. *J. Neurochem.* 71, 1616–1625. PMID: 9751195

Zhaoxia Sun, James Hsiao, David S. Fay and David F. Stern (1998). Rad53 FHA domain associated with phosphorylated Rad9 in the DNA damage checkpoint. *Science* 281, 272–274. PMID: 9657725

David S. Fay, Zhaoxia Sun and David Stern (1997). Mutations in *SPK1/RAD53* that specifically abolish checkpoint but not growth-related functions. *Curr. Gen.* 31, 97–105. PMID: 9021124

Zhaoxia Sun, David S. Fay, Federica Mariani, Marco Foiani and David F. Stern (1996). Spk1p is regulated by *MEC1*-dependent protein phosphorylation in DNA replication and damage checkpoint pathways. *Genes Dev.* 10, 395–406. PMID: 8600024

Pan Zheng, David S. Fay, Janet Burton, Hong Xiao, Jennifer L. Pinkham and David F. Stern. (1993). *SPK1* is an essential S-phase-specific gene of *Saccharomyces cerevisiae* that encodes a nuclear serine/threonine/tyrosine kinase. *Mol. Cell. Biol.* 13, 5829–5842. PMID: 8355715

Vassiliki Karantza, Anjili Maroo, David Fay and John Sedivy (1993). Overproduction of Rb protein after the G1/S boundary causes G2 arrest. *Mol. Cell. Biol.* 13, 6640–6652. PMID: 8413260

Ahmad B. Fawzi, David S. Fay, Elizabeth A. Murphy, Haya Tamir, Joseph J. Erdos, and John K. Northup (1991). Rhodopsin and the retinal G-protein distinguish among G-protein  $\beta\gamma$  subunit forms. *J. Biol. Chem.* 19, 12194–12200. PMID: 1905716

#### **METHODS, TOOLS, GUIDES, REVIEWS, BOOK CHAPTERS (20 total)**

Samuel F. Fay, David S. Fay\*, and Vikram E. Chhatre (2021). CRISPRcruncher: A tool for engineering restriction sites into coding regions. *MicroPubl Biol.* 2021 Jan 18;2021. doi: 10.17912/micropub.biology.000343. PMID: 33490886

Vladimir Lažetić and David S. Fay\* (2017). Molting in *C. elegans*. *Worm*, 6(1):e1330246 PMID:28702275

David S. Fay\* (2013). WormBook Methods: Classical Genetic Methods. The *C. elegans* Research Community, WormBook, doi/10.1895/wormbook.1.165.1, <http://www.wormbook.org>. PMID: 24395816

David S. Fay\* and Ken Gerow (2013). WormBook Methods: A biologist's guide to statistical thinking and analysis. The *C. elegans* Research Community, WormBook, doi/10.1895/wormbook.1.159.1, <http://www.wormbook.org>. PMID: 23908055 *F1000 recommended*.

David S. Fay\* (2013). Cancer Metabolism: Feeding a worm to starve a tumor. *Curr. Biol.* 23, R557–559. PMID: 23845240

Natalia V. Kirienko, Kumaran Mani, and David S. Fay\* (2010). Cancer Models in *C. elegans*. *Dev. Dyn.* 239, 1413–1448. PMID: 20175192

David S. Fay\* (2008). Classic genetics goes high tech. *Nat. Methods.* 5, 863–864. PMID: 18825128

David S. Fay\* and John Yochem (2007). The SynMuv genes of *Caenorhabditis elegans* in vulval development and beyond. *Dev. Biol.* 306, 1–9. PMID: 17434473

David S. Fay\* (2006). WormBook Methods: Genetic Mapping and Manipulation: **Chapters 1–10**. ed. The *C. elegans* Research Community, WormBook, doi/10.1895/wormbook.1.90.1, <http://www.wormbook.org>. (PubMed lists 10 separate headings, one for each chapter). PMIDs: 18050454–18050463, 18819170.

David S. Fay\* (2005). The cell cycle and development: Lessons from *C. elegans*. *Sem. Cell Dev. Biol.* 16, 297–406. PMID: 15840448

David S. Fay and Min Han (2000). The synthetic multivulval genes of *C. elegans*: functional redundancy, Ras-antagonism, and cell fate determination. *Genesis* 26, 279–284. PMID: 10748467

### **IN PREPARATION / SUBMITTED (3)**

Shaonil Binti, Philip T. Edeen, and David S. Fay\* (2024). Loss of the cation exchanger, CATP-1, suppresses *nekl*-associated molting and trafficking defects. *In preparation for winter 2024 submission*.

Shaonil Binti, Adison G. Linder, Phillip T. Edeen, and David S. Fay\* (2024). The *C. elegans* PTPN22 ortholog functions in diverse developmental processes *In preparation for winter 2024 submission*.

Owen Funk, Daniel L. Levy\*, David S. Fay\* (2024). Fusion of the cells in the *C. elegans* epidermis is required for the transition from embryonic-to larval transcriptional programs. *In preparation for spring 2024 submission*.

\* Corresponding author(s) (2002–present)

### **RECENT HONORS/AWARDS**

- 2023 *Fay-Stark Initiative* (Stark-family donation based lectureship)
- 2021 *Andrew Vanvig Distinguished Faculty Lifetime Achievement Award*
- 2019–2023 National Institutes of Health Dev1 standing member
- 2018 Nominated for election to Genetics Society of America Board of Directors
- 2016 *Agriculture Extension Station Outstanding Senior Researcher Award*
- 2015 *Albany County School District Outstanding Wisdom and Leadership Award*
- 2012 *University of Wyoming Distinguished Graduate Faculty Mentor Award*
- 2006–2008 *National American Cancer Society Ambassador* (Wyoming Representative)

### **PROFESSIONAL ACTIVITIES AND SERVICE**

#### **Highlights and Broader Impacts**

- **2015–present** Associate Director and Developmental Projects PI, Wyoming NIH INBRE
  - Funds from this NIH program project grant are intended to promote biomedical research throughout the state of Wyoming and western region. Since 2015, I have been directly involved in allocating INBRE resources to support dozens of faculty research projects, scores of graduate and undergraduate trainees, and millions of dollars in research infrastructure. I also take a direct role in mentoring students and junior faculty through many initiatives that I initiated.
- **2022–present** Co-founder: <https://helpimascientist.com>
  - “A resource by scientists who’ve been in your shoes”. Co-founded with a former undergraduate from my lab (Dr. Katherine Rogers – now a PI at NIH), this website seeks to provide practical advice, insights, ideas, and viewpoints for trainees and scientists at all career stages and from diverse backgrounds.
- **2006–2015** Director: Molecular and Cellular Life Sciences PhD Program

- I organized and established this biomedical-research graduate umbrella program as an Assistant Professor (2002–2006) and served as its director for 10 years, overseeing ~50 faculty participants and ~100 PhD students.
- **2011–2022** Associate and Senior Editor: Genes, Genomes, Genetics (GSA Journal)
  - I was a founding Associate Editor for G3 in 2011 and appointed as a Senior Editor in 2018. I stepped down in 2022 due to other time commitments but remain on several Genetics Society of America publication and organizational committees.

### **External Grant Reviews**

- 2024 NIH/CSR Blue Ribbon Advisory Panel (Enquire–Cluster 8): Chair
- 2019–2023 Standing member of NIH Dev1 study section (completed service 6/2023)
- 2018 NIH review panel – NIGMS MIRA grants: Adhoc reviewer
- 2018 Human Frontier Science Program: Adhoc reviewer
- 2018 NIH review panel – The Role of Anonymization: Adhoc reviewer
- 2018 NIH review panel – Dev1 study section: Adhoc reviewer
- 2018 NIH review panel – Developmental Biology AREA grants: Adhoc reviewer
- 2018 NIH review panel – Special Emphasis Panel: Adhoc reviewer
- 2016 Biotechnology and Biological Sciences Research Council – GB: Adhoc reviewer
- 2016 NIH review panel – Special Emphasis Panel: Adhoc reviewer
- 2016 NIH review panel – Dev1 study section: Adhoc reviewer
- 2015 Swiss National Science Foundation: Adhoc reviewer
- 2015 NIH review panel – Cell and Developmental Biology AREA grants: Co-Chair
- 2014 NIH review panel – Cell and Developmental Biology AREA grants: Chair
- 2013 NIH review panel – Dev1 study section: Adhoc reviewer
- 2011 NIH review panel – Developmental Biology AREA grants: Adhoc reviewer
- 2010 NIH review panel – Developmental Biology AREA grants: Adhoc reviewer
- 2007 NIH review panel – Dev1 study section: Adhoc reviewer
- 2006–2011 American Cancer Society – Cell/Development Section: Adhoc reviewer
- 2005 USDA review panel: Adhoc reviewer
- 2005 Research Council of Canada: Adhoc reviewer
- 2004 National Science Foundation: Adhoc reviewer
- 2004 Research Council UK: Adhoc reviewer

### **Editorial Work**

- 2018–2022 Senior Editor: G3: Genes/Genomes/Genetics (Oxford University Press)
- 2011–2018 Associate Editor: G3: Genes/Genomes/Genetics
- 2011–2017 Editorial Board: Worm (Landes Biosciences)
- 2005–2011 Editor: WormBook–Genetics Methods (Genetics Society of America)

### **Manuscript Reviews**

- 2001–present Ad hoc reviewer for Nature Genetics, Nature Reviews, Nature Methods, eLife, PLoS Biology, EMBO, Current Biology, Development, Developmental Biology, Journal of Cell Science, BMC Development, BMC Bioinformatics, Genetics, PLoS Genetics, PLoS One, Cell Cycle, Genome Biology, Genome Research, FEBS Letters, etc.



### **National Scientific Advising and Boards**

- 2023 Genetic Society of America (GSA) Genetics Editor in Chief Review Committee
- 2022 Genetic Society of America (GSA) G3 Editor-in-Chief Search Committee
- 2021–present Genetic Society of America (GSA) Publications Committee
- 2015 Graduate Program in Biochemistry, Molecular, Cellular and Developmental Biology, U.C. California, Davis, External Reviewer
- 2013–2017 Center of Biomedical Research Excellence (COBRE), Mount Desert Island Biological Laboratory, External Advisor
- 2013–2014 *Problems in Genetics* (Wiley Blackwell), Content consultant
- 2011–present *BiomEditor*, Scientific Advisory Board Member

### **Overview of Administration and Service at the University of Wyoming**

- 2022–2023 Co-Chair of the Molecular Biology Faculty-Search Committee
- 2021 University of Wyoming Life Sciences Restructuring Committee
- 2020 University of Wyoming COVID Research Working Group
- 2020 University of Wyoming /ANR College COVID Laboratory Safety and Policy Board
- 2020 University of Wyoming COVID Government Relations Working Group
- 2019–2021 University of Wyoming Grand Challenges Committee
- 2019–present NIH Wyoming INBRE Associate Director
- 2015–present NIH Wyoming INBRE Director of the Developmental Research Project Program (DRPP) Core
- 2015–2016 Chair of the Molecular Biology Faculty-Search Committee
- 2007–2015 University of Wyoming Graduate School Executive Committee
- 2006–2014 Director of the Molecular and Cellular Life Sciences PhD program
- 2003–2006 Director of the Molecular and Cellular Life Sciences Steering Committee
- 2001–present Dozens of departmental/college/UW-level committees including faculty search, curriculum, graduate education, tenure and promotion, Science Initiative, and PhD student committees etc.

### **INVITED ORAL PRESENTATIONS**

- University of Hawaii (4/23)
- University of Toronto (2/23)
- NYU School of Medicine (5/22)
- University of Michigan (5/22)
- Rice University (4/22)
- California State University East Bay (4/22)
- University of Minnesota (3/22)
- Front Range Cytoskeletal Meeting (8/21)
- University of Nebraska Medical Center (6/21, 11/22)
- *C. elegans* International Meeting (6/21)
- Rutgers University (11/19)
- University of Colorado Health Sciences (9/19)
- Cornell University (10/18)
- *C. elegans* International Meeting (6/17)
- Genetics Society of America Conference (7/16)

- National Institutes of Health (6/16)
- Colorado State University (12/15)
- University of California, Davis (11/15)
- University of Minnesota (10/15)
- *C. elegans* International Meeting (6/15)
- University of Pennsylvania (9/14)
- Mount Desert Island Biological Laboratory (8/14)
- Society for Developmental Biology International Meeting (6/14)
- University of Washington, Seattle (5/14)
- Society for Developmental Biology Southwest Meeting (3/14)
- *C. elegans* International Meeting (6/13)
- Duke University (1/12)
- *C. elegans* International Meeting (6/11)
- *C. elegans* International Meeting (6/09)
- Dartmouth College (11/08)
- University of Calgary (10/08)
- University of Minnesota (9/08)
- Simon Fraser University (8/08)
- Society for Developmental Biology International Meeting (7/08)
- *C. elegans* International Meeting (6/07)
- National Institutes of Health (12/07)
- University of Maryland, College Park (12/07)
- Canadian Institute for Advanced Research (CIAR), Princeton (8/06)
- University of Illinois, Chicago (4/06)
- University of Wyoming, Dept. of Animal Sciences (11/05)
- Society for Developmental Biology Southwest Meeting (10/05)
- University of California, Davis (9/05)
- University of Colorado Health Sciences (4/05)
- University of Illinois, Urbana (11/04)
- *C. elegans* West Coast Meeting (7/04)
- University of Wyoming, Dept. of Zoo/Phys (12/03)
- ACS National Meeting (11/03)
- University of Colorado Health Sciences (10/02)
- Regional (WY/CO) presentations on behalf of the ACS ~20 (2003–2008)

### **NATIONAL/INTERNATIONAL MEETING PRESENTATIONS**

In addition to presentations, I've helped organize regional and national meetings including the upcoming Society for Developmental Biology (Denver) and Genetics Society of America (Washington D.C.) meetings in Spring 2024.

- *C. elegans* Development and Cell Biology Meeting (8/22)
- Society for Developmental Biology International Meeting (7/22)
- INBRE Western Conference (6/22)
- *C. elegans* International Meeting (6/21)
- *C. elegans* Skin Biology Topic Meeting (2/21)

- Allied Genetics Conference (4/20)
- *C. elegans* International Meeting (6/19)
- INBRE Western Regional Conference (10/19)
- INBRE Western Regional Conference (10/17)
- *C. elegans* International Meeting (6/17)
- Allied Genetics Conference (7/16)
- INBRE National Conference (6/16)
- *C. elegans* International Meeting (6/15)
- Society for Developmental Biology International Meeting (6/14)
- Society for Developmental Biology Southwest Meeting (3/14)
- *C. elegans* International Meeting (6/13)
- Society for Cell Biology International Meeting (12/11)
- *C. elegans* International Meeting (6/11)
- Society for Developmental Biology International Meeting (8/10)
- *C. elegans* International Meeting (6/09)
- Society for Developmental Biology International Meeting (7/08)
- *C. elegans* International Meeting (6/07)
- CIAR Genetic Networks (8/06)
- *C. elegans* Development Meeting (6/06)
- Society for Developmental Biology Southwest Meeting (10/05)
- *C. elegans* International Meeting (8/05)
- West Coast *C. elegans* Meeting (8/04)
- Society for Developmental Biology International Meeting (7/04)
- The Cell Cycle and Development – Keystone meeting (1/04)
- ACS National Meeting (11/03)
- *C. elegans* International Meeting (6/03)
- West Coast *C. elegans* Meeting (8/02)

## **COURSES TAUGHT**

### **Classroom**

- 2021–present** • Beyond the Bench: Fundamental Skill Sets for Biomedical Researchers  
(MOLB 5700) *See below for 2023 syllabus*
- 2020** • Special Topics in Molecular Biology (MOLB 4900 Session I)
- 2020** • Special Topics in Molecular Biology (MOLB 4900 Session II)
- 2004–2020** • Cell and Developmental Genetics (MOLB 4450/5450)
- 2005–2020** • MCLS Cornerstone Course (MOLB 5630-02)
- 2005** • Undergraduate Student Seminar (MOLB 4050)
- 2004** • Graduate Student Seminar (MOLB 5050)
- 2003** • Molecular Genetics (MOLB 4440/5440)
- 2002** • Departmental Seminar (MOLB 4051/5051)
- 2002** • Developmental and Molecular Cell Biology (MOLB 5670)
- 2002** • Graduate Student Seminar (MOLB 5050)

### **Research Based**

- Problems in Molecular Biology (MOLB 5010)
- Advanced Problems in Molecular Biology (MOLB 5520)
- Dissertation Research (MOLB 5980)

## **Syllabus: Principles of Biomed Research: MOLB 5700-01 (concise version)**

Course Title: **Beyond the Bench: Fundamental Skill Sets for Biomedical Researchers**

Course Duration: **01/18/2023 – 05/3/2023**

Credit hours: **3**      Grade: **S/U**

### **Main Instructor/Organizer**

David S. Fay, PhD

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Office hours: Flexible and arranged as needed with individual students

### **Associate Instructor and Course Coordinator**

Annie Bergman, PhD

Room 2234 SI

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### **Course Goals and Purpose:**

The purpose of the course is to provide practical skills and information to graduate Ph.D. students working in the broad area of biomedical research. Although students at all stages are welcome, it may particularly benefit students at early-to-mid career stages (years 1–3). Many of the critical skills required to be successful in the field of biomedical research are not explicitly or systematically taught through traditional curriculums. This course aims to fill such gaps and to position students for success during their Ph.D. and beyond. Classes will be structured as a series of complementary workshops.

Students receiving 2-year INBRE GA awards will generally be required to take the course in the first year of their INBRE support, although second-year INBRE GAs may be permitted in some cases. Non-INBRE-supported students may take the course as an elective as space allows. We anticipate approximately 10 INBRE-supported students to be enrolled each year and these students will receive enrollment priority. If students have already taken the course as an elective prior to receiving INBRE GA support, they will not be required to repeat the course.

### **Course Topics: (15 weeks)**

1) Scientific Principles Everyone Should Know. (1 week; 1/18). We will collectively derive some of key foundational principles for conducting scientific research. Topics will include the importance of controls, repetition, reproducibility, complementary approaches, and the removal of bias. We will discuss concepts including necessary versus sufficient and correlation versus causation. In addition, the value of hypothesis versus needs-based studies will be addressed. [D. Fay]

2) Scientific Ethics and Conduct. (1 week; 1/25). We will address several categories of scientific misconduct including recent high-profile case studies involving plagiarism, misrepresentation, and fabrication. What patterns are apparent in cases of scientific misconduct and how can these situations be avoided? What responsibilities do scientists have for reporting suspected cases of fraud? [C. Brandt, K. Shimkus, D. Fay]

3) How to Succeed: In the Lab. (1 week; 2/1). We will discuss specific stages and goal posts common to scientific development through the PhD and beyond. How does one self-evaluate and achieve this progression? What are some common stumbling points and how do you recover? How hard will it be to reach the top and what will it take? [Katherine Rogers (NIH), D. Fay]

4) Scientific Resiliency. (1 week; 2/8). Navigating school, the career exploration process, research environments, and the stress of life can be challenging and lead us to doubt ourselves just when we need confidence the most. We will discuss and practice cultivating select resilience skills from the NIH series on 'Becoming a Resilient Scientist'. These skills will help you to define resilience and to identify and deal with obstacles that may get in the way of success and happiness. [A. Bergman]

5) How to Succeed: Outside the Lab. (1 week; 2/15). What are the behavioral norms in professional settings such as meetings and interviews? How important is networking and how do you go about it? How do you write professional letters and prepare a CV? How do you navigate through complex cultural and gender expectations? What happens if you're not especially outgoing? [Carolyn Bohach (U. Idaho), Katherine Rogers (NIH), D. Fay]

6) Developing Computational Chops. (4 weeks; 2/22, 3/1, 3/8, 3/22). Students will be instructed in the use of R for storing, organizing, and analyzing datasets, along with carrying out statistical tests and generating publication-quality figures. The first week will cover the basics of R and command line and is optional for those you have sufficient background. [Wyoming INBRE Data Science Core]

7) Why You Need to Understand Statistics. (1 week; 3/29 6–8 PM Pizza Class!). This section will cover key concepts in biomedical statistics, emphasizing critical areas, pit falls, misconceptions, and some important "Do's and Don'ts". Topics will include standard tests, non-classical approaches, best practices, and interpretation. Prior to the class, students will be assigned reading to re-familiarize themselves with core statistical concepts. [K. Gerow, D. Fay]

8) Making Publication-Quality Figures. (1 week; 4/5, 9:30–noon – Meet at Coe). Students will be exposed to standard commercial software packages including Adobe and GraphPad, as well as free alternatives. What are they specifically good for and what are the pluses and minuses of the various options. In addition, basic principles of design for making clear informative figures will be covered [Kathryn Senn, Coe Studio, D. Fay]

9) How to Get a Paper. (1 week; 4/12, 10–noon). One of the biggest hurdles in graduate school is learning how to generate your first publication. More than a skill, it's a mindset that goes well beyond working hard and being technically proficient. This class will cover essential strategies for being scientifically productive including how to "see the paper" from an early stage and how to be both flexible and efficient in getting across the finish line. [D. Fay and D. Levy]

10) How to Give a Talk. (1 week; 4/19, 9–11). Communicating science is one of the most important skills any scientist can develop. Every presentation you give, whether to others in your lab or to hundreds of colleagues at an international meeting, is an opportunity to create a favorable impression. It's also the foundation of teaching itself, as well as scientific discourse. This class will cover key elements that are essential for giving a good talk and, by example, will include many pointers and pitfalls. [Anne Hart (Brown), Arjun Raj (U. Penn), D. Fay]

11) Careers: What are the options in your field? (2 weeks; 4/26, 5/3). How do you decide which career paths you are most suited for? How do you go about pursuing specific career options? Discussions will mostly include career options in academics and the private sector. Students will hear directly from Ph.Ds. working in academia (4/26) and industry (5/3) about how their careers unfolded and what they've learned along the way. [Guests Katherine Rogers (NIH), Jennifer Powell (Gettysburg College); Andy Spencer (Empirico), Richik Mukherjee (Sanofi), Lidjia Vuković (Trotana Therapeutics)]