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EDUCATION

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

ACADEMIC POSITIONS

2010–present Professor, Dept. Molecular Biology, University of Wyoming
2006–2010 Associate Professor, Dept. Molecular Biology, University of Wyoming
2001–2006 Assistant Professor, Dept. Molecular Biology, University of Wyoming
1997–2001 Postdoctoral Fellow, University of Colorado, Boulder & HHMI
1996–1997 Postdoctoral Fellow, Johns Hopkins University

FINANCIAL SUPPORT

Current

2016–2020 **National Institutes of Health (NIH) (GM066868)**

- “Characterizing Novel Functions of Conserved NIMA Family Kinases”
- Total costs: \$1,697,343

2017–2021 **National Institutes of Health (NIH) (GM125091)**

- “Mechanisms controlling tissue morphogenesis, architecture, and the response to mechanical forces in *C. elegans*”
- Total costs: \$1,363,000

2016–2017 **National Institutes of Health/INBRE (P20 GM103432)**

- Total costs: \$58,000

Previous

2015–2016 **National Institutes of Health/INBRE (P20 GM103432)**

- Total costs: \$29,000

2010–2015 **National Institutes of Health (NIH) R01 GM066868-06**

- “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**
- “Developmental Functions of Rb Family Proteins”
 - Total costs: \$72,000
- 2009–2010 National Institutes of Health (NIH) R01 GM066868-05S1**
- “Developmental Functions of Rb Family Proteins”
 - Total costs: \$131,084
- 2004–2010 National Institutes of Health (NIH) R01 GM066868-01**
- “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**
- “The Retinoblastoma Protein in *C. elegans*”
 - Total costs: \$799,000

PEER-REVIEWED PUBLICATIONS (51 total; 1991–present)

PRIMARY RESEARCH PUBLICATIONS (31 total)

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. PMID: 25798732. <http://elifesciences.org/content/4/e06565>

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

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

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

Aaron M. Bender, Natalia V. Kirienko, 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

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 β -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

REVIEWS, METHODS, AND BOOK CHAPTERS (20 total)

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

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: Forward Genetics and Genetic Mapping: Chapters 1–10. ed. The *C. elegans* Research Community, WormBook, doi/10.1895/wormbook.1.90.1, <http://www.wormbook.org>. (PubMed lists 11 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

SUBMITTED/IN PREPARATION

Braveen Joseph, Nic Blouin, and David S. Fay* (2017). Use of a sibling subtraction method (SSM) for identifying causal mutations by whole genome sequencing. *In review, Genetics*.

Vladimir Lazetic, Braveen Joseph, and David S. Fay* (2017). Actin organization is controlled by a Nima-related kinase–CDC-42 network in *C. elegans*. *In preparation for PLoS Genetics*.

Sophie S. Katz, Vijaykumar S. Meli, Gabriela C. Monsalve, Hannah Maul-Newby, Emel Kasgarli, Tamar Resnick, John J. Yochem, David S. Fay, and Alison R. Frand (2017). *C. elegans fbn-1* Encodes Apical Extracellular Matrix Proteins Essential for Molting and Other Tension-Dependent Morphogenetic Events. *In revision*.

* Corresponding author(s) (2002–present)

INVITED ORAL PRESENTATIONS

- University of Colorado Health Sciences (10/17)
- *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)

MEETINGS

- 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)
- Front Range Monthly *C. elegans* Meetings (2001–present)

RECENT HONORS/AWARDS

- 2016 *Agriculture Extension Station Outstanding Researcher Award*
- 2015 *Albany County School District Outstanding Wisdom and Leadership Award*
- 2012 *University of Wyoming Distinguished Graduate Faculty Mentor Award*
- This university-level award is given to one recipient annually.
- 2006– 2008 *National ACS Ambassador (Wyoming Representative)*
- This two-year appointment involved traveling to Washington D.C. to meet with Wyoming's Congressional leaders as well as local meetings with Wyoming's governor and state legislators. Our primary mission was to lobby for increased funding for biomedical and cancer research and to highlight biomedical research at the University of Wyoming.

ADMINISTRATIVE DUTIES

- NIH Wyoming NIH/INBRE Director of the Developmental Research Project Program Core (2015–present)
- Director of the Molecular and Cellular Life Sciences (MCLS) Graduate Program (2005–2016)
- Chair of the Molecular and Cellular Life Sciences Developmental Steering Committee (2002–2005)

PROFESSIONAL ACTIVITIES AND SERVICE

Manuscript Reviews

- Ad hoc reviewer for *Nature Genetics*, *Nature Reviews*, *Nature Methods*, *EMBO Journal*, *Current Biology*, *Development*, *Developmental Biology*, *Development Wire Reviews*, *Mechanisms of Development*, *BMC Development*, *Genetics*, *PLoS Genetics*, *PLoS One*, *Cell Cycle*, *Genome Biology*, *Genome Research*, *Open Biology*, *Physiological Genomics*, *FEBS letters*, *Biochimica et Biophysica Acta* (2001–present)

Editorial Boards

- *G3: Genes/Genomes/Genetics*, (Genetics Society of America, publisher). Associate Editor (2011–present)
- *Worm* (Landes Biosciences, publisher). Editorial Board Member (2011–present)
- *WormBook*, Editor, Genetic Methods Section (2005–2011)

Scientific Advising Duties

- *Graduate Program in Biochemistry, Molecular, Cellular and Developmental Biology, U.C. California, Davis*, External Reviewer (2015).
- *Center of Biomedical Research Excellence (COBRE), Mount Desert Island Biological Laboratory*, External Advisor (2013– present).
- *BiomEditor*, Scientific Advisory Board Member (2011– present)
- *Problems in Genetics* (Wiley Blackwell), Content consultant (2013–2014)

Grant Panels and External Reviews

- Biotechnology and Biological Sciences Research Council – Great Britain (2016)
- NIH review panel: Adhoc member Special Emphasis Panel (2016)
- NIH review panel: Adhoc member for Dev1 study section (2016)
- Swiss National Science Foundation: Adhoc reviewer (2015)
- NIH review panel: Co-Chair for Cell and Developmental Biology AREA grants (2015)
- NIH review panel: Chair for Cell and Developmental Biology AREA grants (2014)
- NIH review panel: Adhoc member for Dev1 study section (2013)
- NIH review panel: Adhoc member for Developmental Biology AREA grants (2010–2011)
- ACS review panel: Adhoc member for Development Differentiation and Cancer section (2006–2011)
- NIH review panel: Adhoc member for Dev1 study section (2007)
- NSF grant reviewer: Adhoc (2004–present)
- Research Council of Canada: Adhoc (2005–present)
- Research Council UK: Adhoc (2004–present)
- USDA review panel: Adhoc (2005)

DEPARTMENTAL AND UNIVERSITY SERVICE

- MCLS Executive Committee member (2016–)
- Departmental Search Committee for Quantitative Biologist, Chair (2015–2016)
- University Graduate School Council (2014–2016)
- Committee for Scientific Misconduct (2014)
- College of Agriculture Tenure and Promotion Committee (2013–2015)
- Graduate Education Regulations Subcommittee (2009–2012)
- Zoology/Physiology Search Committee (2010)
- MOLB Departmental Search Committee for two faculty positions (2009–2011)
- University of Wyoming Microscopy Core Facility Board (2008–2009)
- Departmental Search Committee for Molecular Biologist (2008–2009)
- Departmental Committee for Resource Distribution (2006–2008)
- Departmental Search Committee for Ecological Geneticist (2005–2006)
- Animal Science Search Committee for Functional Geneticist (2005–2006)
- University Graduate School Council (2005–2008)
- University Committee for Genetics Curriculum (2004–2008)
- Departmental Committee for Curriculum Review (2004–present)
- Department Chair Search Committee (2003–2004)
- Wyoming Science Fair judge (2002–2004)
- Graduate Student Thesis Committees (12 students total, 2002–present)

- Organizer/speaker graduate student recruitment trips/Colorado (2002)

OTHER SERVICE AND MEMBERSHIPS

- ACS regional representative/speaker (Has included ~20 talks to ACS volunteer groups including Jackson, Capser, Gillette, Laramie, Cheyenne, and Denver)
- Genetics Society of America
- Society for Developmental Biology
- American Association for the Advancement of Science

COURSES TAUGHT

Classroom

- Spring 2017** • Cell and Developmental Genetics (MOLB 4450/5450)
- Spring 2016** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2015** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2015** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2014** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2014** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2013** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2013** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2012** • MCLS Cornerstone Course (MOLB 5630-02)
- Fall 2011** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2011** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2010** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2010** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2009** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2009** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2008** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2008** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2007** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2007** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2006** • MCLS Cornerstone Course (MOLB 5630-02)
- Spring 2006** • Cell and Developmental Genetics (MOLB 4450/5450)
- Fall 2005** • Undergraduate Student Seminar (MOLB 4050)
- Spring 2005** • Cell and Developmental Genetics (MOLB 4450/5450)
- Spring 2004** • Cell and Developmental Genetics (MOLB 4450/5450)
- Graduate Student Seminar (MOLB 5050)
- Spring 2003** • Molecular Genetics (MOLB 4440/5440; equivalent to 4450/5450)
- Fall 2002** • Departmental Seminar (MOLB 4051/5051)
- Developmental and Molecular Cell Biology (MOLB 5670)
- Spring 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)