



## CURRICULUM VITAE

### ERIK MATHIAS JORGENSEN

Distinguished Professor, School of Biological Science, University of Utah  
Adjunct Professor, Department of Biomedical Engineering  
Adjunct Professor, Department of Human Genetics  
Investigator, Howard Hughes Medical Institute  
Member, National Academy of Science

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#### Professional Experience

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- 2013-present **Distinguished Professor**, School of Biological Sciences, University of Utah. Genetic analysis of neurotransmission in the nematode *C. elegans*.
- 2013-2015 **Visiting Scientist**, Neurocure Crossover, Charité Universitätsmedizin, Berlin, Germany. Postsynaptic endocytosis of AMPA receptors.
- 2012-2013 **Sabbatical**, Charité Universitätsmedizin, Berlin, Germany. Synaptic vesicle endocytosis. Host: Christian Rosenmund.
- 2011 **Director**, Advanced Microscopy Facility, University of Utah
- 2005-present **Investigator**, Howard Hughes Medical Institute.
- 2005-present **Adjunct Professor**, Department of Human Genetics, University of Utah.
- 2004-present **Adjunct Professor**, Department of Biomedical Engineering, University of Utah.
- 2003-2013 **Professor**, Dept of Biology, University of Utah. Genetic analysis of neurotransmission in the nematode *C. elegans*.
- 2003-2010 **Scientific Director**, Brain Institute, University of Utah.
- 2000-2003 **Associate Professor**, Dept of Biology, University of Utah. Genetic analysis of neurotransmission in the nematode *C. elegans*.
- 2001-2002 **Sabbatical, Associate Professor**, Dept of Biology, Ecole Normale Supérieure, Paris, France. Double-strand break repair in the nematode *C. elegans*. Host: Professeur Antoine Triller.
- 1994-2000 **Assistant Professor**, Dept of Biology, University of Utah. Genetic analysis of neurotransmission in the nematode *C. elegans*.
- 1989-1994 **Postdoctoral Fellow**, MIT, Advisor: Dr. H. Robert Horvitz. Genetic analysis of GABA function in the nematode *C. elegans*.
- 1984-1989 **Graduate Student**, University of Washington, Advisor: Dr. Richard Garber. Transcriptional regulation of the *Antennapedia* gene in *Drosophila*.

## Education

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- 1983-1989 University of Washington, Seattle, Washington; Department of Genetics, Ph.D.  
 1982-1983 University of Heidelberg, Heidelberg, West Germany; Department of Biology, Major: Molecular Biology.  
 1981-1982 University of California at Berkeley, Department of Genetics, Major: Genetics.  
 1976-1979 University of California at Berkeley, Bachelor's of Science Degree from the College of Natural Resources, Major: Animal Resources.  
 1974-1976 West Valley Junior College. Saratoga, CA.

## Awards

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- 2022 Member, National Academy of Science  
 2022 Member, Utah Academy of Engineering and Science  
 2015 Utah Governor's Medal for Science and Technology  
 2015 Roger Eckert Memorial Award, Goettingen University  
 2014-2015 Frank Lillie Innovation Award, Univ of Chicago & Marine Biological Lab  
 2014 Allen Harmon Endowed Lecture, Oklahoma Medical Research Foundation  
 2013 Distinguished Professor, University of Utah  
 2012 Humboldt Prize, Alexander von Humboldt Foundation, Germany  
 2011 Distinguished Scholarly and Creative Research Award, University of Utah  
 2010 College of Science Professor, University of Utah

## Current Funding

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- 2023-2027 NIH NIGMS 1R01GM146005-01A1  
 "Genome Engineering in the nematode *C. elegans*"  
 2020-2025 NSF, subcontract from University of Texas at Austin  
 "NeuroNex: Enabling Identification and Impact of Synaptic Weight in Functional Networks"  
 1995-2025 NIH NINDS 5R01NS034307 "Synaptic Function in the Nematode *C. elegans*."  
 2005-2029 Howard Hughes Medical Institute Investigator

## Training

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### Teaching (2022-23)

- Summer 2023 Neurobiology Course Lecturer. Marine Biological Laboratory, Woods Hole  
 Spring 2023 BIOL3960, Eukaryotic Genetics Lab (Jorgensen lab personnel), Univ of Utah  
 Fall 2022 BIOL6140, Advanced Genetics, University of Utah  
 Fall 2022 NS6040, Cellular and Molecular Neuroscience, University of Utah

### Laboratory Personnel (2022-23)

Graduate Students (Total 37). Current: S. West, S. Fernando, B. Mueller, T. Page.  
 Postdoctoral Fellows (Total 33) Current: C. Wnukowski, B. Graham, A. Hefel, K. Kruse, M. Rich  
 Undergraduate Students (Total 120) Current: K. Wall, N. Raymond, P. Biehler, G. Dhiman  
 3 Senior Scientists, 2 Laboratory Technicians, 3 Student Laboratory Assistants

## Research Products

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### Patents

Microscopy Visualization (#9,104,903). Status: Issued. Type: Parent/Utility. Inventors: Steven P. Callahan, Bryan W. Jones, Greg M. Jones, Erik M. Jorgensen, Stan Kanarowski, John Schreiner, Tolga Tasdizen, Shigeki Watanabe, Joshua E. Cates. File date 03/18/2013; Issue date 08/11/2015. Assignee: The University of Utah. Country: United States.

Microscopy System and Method for Creating Three Dimensional Images Using Probe Molecules (#8,994,807). Status: Issued. Type: Nationalized PCT-US. Inventors: Brian T. Bennett, Joerg Bewersdorf, Erik M. Jorgensen, Travis Gould, Samuel T. Hess, Mudalige Siyath Gunewardene. File date 04/11/2012; Issue date 03/31/2015. Assignee: The University of Utah. Country: United States.

H+-Gated Ion Channel (#8,232,063). Status: Issued. Type: Continuation [CN]. Inventors: Erik M. Jorgensen, Asim A. Beg, Paola Nix. File date 08/17/2011; Issue date 07/31/2012. Assignee: The University of Utah. Country: United States.

H+-Gated Ion Channel (#7,820,791). Status: Issued. Type: Continuation [CN]. Inventors: Erik M. Jorgensen, Asim A. Beg, Paola Nix. File date 08/08/2008; Issue date 10/26/2010. Assignee: The University of Utah. Country: United States.

Method of Transposon-Mediated Mutagenesis in the Nematode *Caenorhabditis Elegans* (#7,196,244). Status: Issued. Type: Nationalized PCT-US. Inventors: Jean-Louis Bessereau, Erik M. Jorgensen. File date 11/01/2001; Issue date 03/27/2007. Assignee: The University of Utah. Country: United States.

## Software



SapTrap builder is a program for guided construction of reagents for CRISPR-based genome engineering. Released: 2016.

Inventors: M. L. Schwartz and E. M. Jorgensen.

Available: [https://jorgensen.biology.utah.edu/matts/saptrap\\_builder/](https://jorgensen.biology.utah.edu/matts/saptrap_builder/)

### Reference:

Schwartz, M.L., E.M. Jorgensen. 2016. SapTrap, a toolkit for high-throughput CRISPR/Cas9 gene modification in *C. elegans*. *Genetics* 202, p. 1277-1288. doi: 10.1534/genetics.115.184275.

Schwartz, M.L., E.M. Jorgensen. 2018. SapTrap vectors for introducing point mutations with unc-119+ selection. *microPublication Biology*. <https://doi.org/10.17912/DDVH-BG64>.

Schwartz, M.L., E.M. Jorgensen. 2018. SapTrap Builder: a desktop utility for CRISPR edit design. *microPublication Biology*. <https://doi.org/10.17912/M4QQ02X02>.



## ApE

ApE is an integrated program for plasmid construction and visualization. A program designed by a molecular biologist, for molecular biologists. Released: 2005.

Inventors: M. W. Davis and E. M. Jorgensen.

Available: <https://jorgensen.biology.utah.edu/wayned/ape/>

### Reference:

Davis, M.W., E.M. **Jorgensen**. 2022. ApE, A plasmid Editor: a freely available DNA manipulation and visualization program. *Frontiers in Bioinformatics-Data Visualization* 04 Feb, <https://doi.org/10.3389/fbinf.2022.818619>.

**Publications****Total Published: 156**Manuscripts in preparation:

Palfreyman, M., S.E. West, E.M. **Jorgensen**. 2023. SNARE proteins in synaptic vesicle fusion. Molecular Mechanisms of Neurotransmitter Release.

Published manuscripts: 2022- HHMI Open Access Publications Policy takes effect

Fernando, S, J. Martineau, R. Hobson, E. **Jorgensen**, J Gerton. 2022. Two-Color Fixed Cell Imaging Using Engineered Point Spread Functions – XPSF Family. *Microscopy and Microanalysis* 28(S1) 1564-1566.

Mueller, B.D., S.A. Merrill, S.Watanabe, P.Liu, A.Singh, A.Cherry, M.Silva, Z.W. Wang, E.M. **Jorgensen**. 2022. CaV1 and CaV2 calcium channels mediate the release of separate synaptic vesicle pools. *eLife* (submitted). bioRxiv doi: <https://doi.org/10.1101/2022.05.03.490438>

Imoto, Y, S. Raychaudhuri, Y. Ma, P. Fenske, E. Sandoval, K. Itoh, L. Mamer, F. Zarebidaki, B. Söhl-Kielczynski, T. Trimbuch, S. Nayak, J.H. Iwasa, T. Ha, E.M. **Jorgensen**, C. Rosenmund, S. Watanabe. 2022. Dynamin is primed at endocytic sites for ultrafast endocytosis. *Neuron*. 110:2815-2835. <https://doi.org/10.1016/j.neuron.2022.06.010>

Parra-Rivas, L.A., M.T. Palfreyman, T.N. Vu, E.M. **Jorgensen**. 2022. Interspecies complementation identifies a pathway to assemble SNAREs. *iScience* 25(7): 104506. <https://doi.org/10.1016/j.isci.2022.104506>

Davis, M.W., E.M. **Jorgensen**. 2022. ApE, A plasmid Editor: a freely available DNA manipulation and visualization program. *Frontiers in Bioinformatics-Data Visualization* 04 Feb, <https://doi.org/10.3389/fbinf.2022.818619>.

Guo, R., S. Nelson, M. Reigier, M. W. Davis, E.M. **Jorgensen**, J. Shepherd, R. Menon. 2022. Scan-less machine-learning-enabled incoherent microscopy for minimally-invasive deep-brain imaging. *Optics Express*. 30:1546-1554. <https://doi.org/10.1364/OE.446241>.

Rich, M. S., Nix, P., E.M. **Jorgensen**. 2022. The *C. elegans* mapping locus *rol-9* is encoded by a gain-of-function mutation in *mlt-11*. *microPublication Biology*. 10.17912/micropub.biology.000506.

Schwartz, M.L., M.W. Davis, M.S. Rich, E.M. Jorgensen. 2021. High-efficiency CRISPR gene editing in *C. elegans* using Cas9 integrated into the genome. *PLoS Genetics* 17(11): e1009755. <https://doi.org/10.1371/journal.pgen.1009755>.

Watanabe S, M.W. Davis, G.F. Kusick, J. Iwasa, E.M. **Jorgensen**. 2020 SynapsEM: Computer-Assisted Synapse Morphometry. *Frontiers in Synaptic Neuroscience*. Dec 18;12:584-549. doi: 10.3389/fnsyn.2020.584549.

Kusick GF, M. Chin, S. Raychaudhuri, K. Lippmann, K.P. Adula, E.J. Hujber, T. Vu, M.W. Davis, EM **Jorgensen**, S. Watanabe. 2020 Synaptic vesicles transiently dock to refill release sites. *Nature Neuroscience*. Nov 23:1329-1338. doi: 10.1038/s41593-020-00716-1. Epub 2020 Sep 28.

LaBella, M.L., E.J. Hujber, K.A. Moore, R. L. Rawson, S. A. Merrill, P.D. Allaire, M. Ailion, J. Hollien, M.J. Bastiani, E.M. **Jorgensen**. 2020. Casein Kinase 1 $\alpha$  stabilizes mature axons by inhibiting transcription termination of ankyrin. *Development Cell*. 52:88-103.

• mini-review Katherine L. Thompson-Peer. 2020. Casein Kinase 1 $\delta$  triggers giant Ankyrin expression. *Dev Cell* 52, p4-5.

\*Herman R: F1000Prime Recommendation of [LaBella ML et al., *Dev Cell* 2020 52(1):88-103.e6]. In F1000Prime, 04 Feb 2020; 10.3410/f.737164126.793570455”

\*Grishok A: F1000Prime Recommendation of [LaBella ML et al., *Dev Cell* 2020 52(1):88-103.e18]. In F1000Prime, 07 Apr 2020; 10.3410/f.737164126.793572910

- Appadurai D, Gay L, Moharir A, Lang MJ, Duncan MC, Schmidt O, Teis D, Vu TN, Silva M, **Jorgensen EM**, Babst M. 2020. Plasma membrane tension regulates eisosome structure and function. *Molecular Biology of the Cell*. 31:287-303.
- Kurshan, P. T., S. A. Merrill, Y. Dong, C. Ding, M. Hammarlund, J. Bai, E.M. **Jorgensen**, K. Shen. 2018.  $\gamma$ -Neurexin and Frizzled mediate parallel synapse assembly pathways antagonized by receptor endocytosis. *Neuron* 100, 150-166.
- Watanabe, S., L.E. Mamer, S. Raychaudhuri, D. Luvsanjav, J. Eisen, T. Trimbuch, B. Söhl-Kielczynski, P. Fenske, I. Milosevic, C. Rosenmund, E.M. **Jorgensen**. 2018. Synaptojanin and endophilin mediate neck formation during ultrafast endocytosis. *Neuron*. 27:1184-1197.
- Martineau, JT, E.M. **Jorgensen**, R. Menon, J. Gerton. 2018. Precisely localizing wavelength sensitive point-spread functions engineered with a silicon oxide phase plate. *Microscopy and Microanalysis*. 24: 1364-1365
- Schwartz, M.L., E.M. Jorgensen. 2018. SapTrap vectors for introducing point mutations with unc-119+ selection. <https://doi.org/10.17912/DDVH-BG64>.
- Schwartz, M.L., E.M. Jorgensen. 2018. SapTrap Builder: a desktop utility for CRISPR edit design. *microPublication Biology*. <https://doi.org/10.17912/M4QQ02X02>.
- Chen, B., P. Liu, E. J. Hujber, Y. Li, E.M. **Jorgensen**, Z. W. Wang. 2017. AIP limits neurotransmitter release by inhibiting calcium bursts from the ryanodine receptor, *Nature Communications*, 8:1380.
- Palfreyman, MP, E.M. **Jorgensen**, 2017. Unc13 Aligns SNAREs and Superprimed Synaptic Vesicles. *Neuron* 85: 473-475.
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- Hobson, R. J., K. J. Yook and E.M. **Jorgensen**, *Genetics of Neurotransmitter Release in Caenorhabditis elegans*, In Reference Module in Life Sciences, Elsevier, 2017, ISBN: 978-0-12-809633-8
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- Geisler, F., H. Gerhardus, K. Carberry, W. Davis, E.M. **Jorgensen**, C. Richardson, O. Bossinger, and R. E. Leube. 2016. A novel function for the MAP kinase SMA-5 in intestinal tube stability. *Molecular Biology of the Cell* 27, p3855-3868.
- Edelman, T. L. B. , K. A. McCulloch, A. Barr, C. Frøkjær-Jensen, E. M. **Jorgensen**, and A. E. Rougvie. 2016. Analysis of a lin-42/period null allele implicates all three isoforms in regulation of *Caenorhabditis elegans* molting and developmental timing. *G3* 6:4077-4086.
- Wheeler, B.S., E. Anderson, C. Frøkjær-Jensen, Q. Bian, E.M. **Jorgensen**, B. J. Meyer. 2016. Chromosome-wide mechanisms to decouple gene expression from gene dose during sex-chromosome evolution. *eLife* 5:e17365. DOI: 10.7554/eLife.17365.
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- Mini-review: W. David Arnold. "Genotype–phenotype correlation with CRISPR-Cas9: Bedside to bench" *Neurology* 87, p1138.

- Frøkjær-Jensen, C., N. Jain, L. Hansen, M.W. Davis, Y. Li, D. Zhao, K. Reborá, JR. Millet, X. Liu, SK. Kim, D. Dupuy, E.M. Jorgensen\*, and A.Z. Fire\*. 2016. An abundant class of non-coding DNA can prevent stochastic gene silencing in the *C. elegans* germline. *Cell* 166, p343-357. (\*co-corresponding authors).
- Commentary: Robert Herman. 2016. Faculty of 1000. <http://f1000.com/prime/726482828>.
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- Commentary: Lewis, S 2016 Nat Rev Neuroscience doi:10.1038/nrn.2016.55
- Schwartz, M.L., E.M. **Jorgensen**. 2016. SapTrap, a Toolkit for High-Throughput CRISPR/Cas9 Gene Modification in *C. elegans*. *Genetics* 202, p1277-1288.
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- Jobson, M.A., C.M. Valdez, J. Gardner, L.R. Garcia, E.M. **Jorgensen**, and A.A. Beg. 2015. Spillover transmission is regulated by the excitatory GABA receptor LGC-35 in *C. elegans*. *J. Neurosci.* 35, p2803-2816.
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- Mini-review: Vladan Lucic 2014. *Nature* 515, p207-208.
- Hollopeter, G.H., J.J. Lange, Y. Zhang, T.N. Vu, M. Gu, M. Ailion, E.J. Lambie, B.D. Slaughter, J.R. Unruh, L. Florens, and E.M. **Jorgensen**. The membrane-associated proteins FCHO and SGIP are allosteric activators of the AP2 clathrin adaptor complex. *eLife* (2014) Oct 10; 3 doi:10.7554/eLife.03648.
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- Frøkjær-Jensen, C., M.W. Davis, M. Sarov, J. Taylor, S. Flibotte, M. LaBella, A. Pozniakovski, D.G. Moerman, and E.M. **Jorgensen**. 2014. Random and targeted transgene insertion in *C. elegans* using a modified Mos1 transposon. *Nature Methods* 11, p529-534.
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- Rawson, R.L., L. Yam, R.M. Weimer, E.G. Bend, E. Hartwig, H.R. Horvitz, S.G. Clark, E.M. **Jorgensen**. 2014. Axons degenerate in the absence of mitochondria. *Current Biology* 24, p760-765.
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- Watanabe, S., M. Lehmann, E. Hujber, R.D. Fetter, J. Richards, B. Söhl-Kielczynski, A. Felies, C. Rosenmund, J. Schmoranzler, and E.M. **Jorgensen**. 2014. Nanometer-resolution fluorescence electron microscopy (nano-fEM) in cultured cells. Ed. J. Kuo. Humana Press. In *Methods in Molecular Biology: Electron Microscopy* 1117, p. Book chapter.
- Kavalali, E., and E.M. **Jorgensen**. 2014. Visualizing Presynaptic Function. *Nature Neuroscience* 17, p10-16. Review.
- Watanabe, S., B. Rost, M. Camacho, M.W. Davis, B. Söhl-Kielczynski, A. Felies, C. Rosenmund and E.M. **Jorgensen**. 2013. Ultrafast endocytosis at mouse hippocampal synapses. *Nature* 504, p242–247.
- Commentary: Thomas Wollert 2013. Faculty of 1000. DOI: 10.3410/f.718197285.793487897.
  - Mini-review: Cho and von Gersdorff. 2013. “Faster than kiss-and-run”. *Nature* 504, p220-221.
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- Watanabe, S., Q. Liu, M.W. Davis, N. Thomas, J. Richards, G. Hollopeter, M. Gu, N.B. Jorgensen and E.M. **Jorgensen**. 2013. Ultrafast endocytosis at the *C. elegans* neuromuscular junction. *eLife* 2, e00723.
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- Qi, Q.B., M.D. Po, P. Mac, T. Kawano, E.M. **Jorgensen**, M. Zhen, Y. Jin. 2013. Hyperactivation of B-type motor neurons results in aberrant synchrony of the *Caenorhabditis elegans* motor circuit. *J. Neurosci.* 33, p5319-5325.
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- Commentary: Justin Taraska, Kem Sochacki. 2013. Faculty of 1000.
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- Watanabe, S., J. Richards, G. Hollopeter, R.J. Hobson, M.W. Davis, and **Jorgensen**, E.M. 2012. Nano-fEM: protein localization using correlative photo-activated localization microscopy and electron microscopy. *Journal of Visual Experiments* 3, e3995. doi: 10.3791/3995.
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