

Josefa Steinhauer, PhD

Specialties: *Drosophila* genetics, developmental biology, molecular biology

Associate Professor of Biology (tenured)

2017-present

Yeshiva College, Yeshiva University

2495 Amsterdam Avenue, Belfer Hall 1408, New York, NY 10033

Office: 212-960-5400 x6295, Cell: 347-886-3142, Email: jsteinha@yu.edu

Place of Birth/Citizenship: New York/USA

Prior Position

2011-2017

Assistant Professor, Yeshiva College, Yeshiva University, New York, NY

Education

Postdoc in Developmental Genetics	NYU Langone Medical Center, New York, NY	2005-2011
PhD in Biological Sciences	Columbia University, New York, NY	2005
MPhil in Biological Sciences	Columbia University, New York, NY	2002
MA in Biological Sciences	Columbia University, New York, NY	2001
BS in Biology	Case Western Reserve University, Cleveland, OH	1999
	<i>summa cum laude</i> , Phi Beta Kappa	

Research Experience

Independent Research

2011-present

Department of Biology

Yeshiva College, New York, NY

- First characterization of phospholipase A₂ in *Drosophila* development and physiology.
- Discovered a novel lipid signaling pathway mediated by the Lands Cycle lysophospholipid acyltransferases Oysgedart and Nesy in *Drosophila* spermatogenesis.
- Collaboration with Andreas Jenny (Albert Einstein College of Medicine): First demonstration of a role for planar cell polarity regulators in *Drosophila* spermatogenesis.
- Collaboration with Eric Lai (Memorial Sloan Kettering Cancer Center): Newly evolved genes are important in male fertility.

Postdoctoral Research

2005-2011

Advisor: Jessica Treisman

Skirball Institute of Biomolecular Medicine

NYU Langone Medical Center, New York, NY

- First characterization of the *Drosophila* lysophospholipid acyltransferases Oysgedart and Nesy. Collaboration with the labs of Robert Murphy (University of Colorado, Denver) and Dennis Voelker (National Jewish Health).
- Analysis of the function and regulation of post-translational palmitic acid modification of the secreted Epidermal Growth Factor Receptor ligand Spitz in *Drosophila*. Collaboration with the lab of Marilyn Resh (Memorial Sloan-Kettering Cancer Center).
- Participated in a cell-based screen for novel lipid modified signaling ligands. Collaboration with the lab of Marilyn Resh (Memorial Sloan-Kettering Cancer Center).
- Participated in a genetic *Drosophila* photoreceptor development screen of the X chromosome.

Ph.D. Thesis Research

2002-2005

Advisor: Daniel Kalderon

Department of Biological Sciences
Columbia University, New York, NY

- Discovered a role for the RNA binding protein Squid in microtubule reorganization and axis formation in the *Drosophila* oocyte.
- Participated in a genetic *Drosophila* PKA oogenesis enhancer screen.

Graduate Research

1999-2002

Advisor: James Erickson

Department of Biological Sciences
Columbia University, New York, NY

- Characterized the undescribed basic leucine-zipper proteins encoded by predicted genes *CG16815* and *CG16813* as potential binding partners of Sisterless-A in *Drosophila*.
- Analyzed Sisterless-A transcriptional activation activity.

Undergraduate Thesis Research

1997-1998

Advisor: Saul Purton

Department of Structural and Molecular Biology
University College London, London, UK

- Mapped and characterized the *rpl36* ribosomal protein gene and its highly conserved operon in the plastid genome of *Chlamydomonas reinhardtii*.

Undergraduate Research

Summer 1996, 1997

Advisor: Marcia Goldberg

Department of Microbiology and Immunology
Albert Einstein College of Medicine, Bronx, NY

- Characterized the IcsA specific protease IcsP as being essential for maintenance of asymmetric IcsA localization at the old cell pole in *Shigella flexneri*.
- Participated in a genetic screen for chaperones of the outer membrane protein IcsA in *Shigella flexneri*.

Teaching Experience

Yeshiva College

2011-present

- NAWO1001, Freshman Core course "The Natural World: From Molecules to Organisms"
- BIO3513C, Genetics lecture and lab
- BIO2601C, Developmental biology lecture and lab
- BIO3521C, Molecular biology lecture and lab
- Students trained in my laboratory:
Aryeh Korman, Jacob Borck† (YC valedictorian finalist), Matthew Lubin, Nathaniel Elkaim, Eitan Dechter*, Yonatan Schwartz†, Daniel Edelman†, Isaac Lipsky*.†, Tzvi Fishkin, Adina Wakschlag, Sogol Eizadshenass (post-Masters), Solomon Friedman*.† (Kressel fellow), Yosef Frenkel† (Kressel fellow, YC valedictorian), Benjamin Statman† (Best Honors Thesis 2015 Natural Sciences), Joel Lasker*, Ryan Fiter† (Kressel finalist), Eli Miller*, Geulah Ben-David (post-bacchalaureate), Michael Goldstein

*Provost's Student Summer Research Scholarship

†Yeshiva College Honors Program

NYU Langone Medical Center

- Students trained in the Treisman laboratory:
Farah Taufiq, Hui Hua Liu (Masters), Sophie Balmer (Masters), Magali Richard (Masters)

2005-2011

Research Grants

- **R15 Academic Research Enhancement Award** **2018-2021**
Calcium Independent Phospholipase A2 in *Drosophila*
National Institute of Child Health and Human Development, NIH
R15HD080511-02
Direct costs: \$250,000
Indirect costs: \$125,000
- **R15 Academic Research Enhancement Award** **2014-2018**
Lipid mediators in *Drosophila* spermatogenesis
National Institute of Child Health and Human Development, NIH
R15HD080511-01
Direct costs: \$250,000
Indirect costs: \$162,140
- **Henry Kressel Research Scholarship** **2016-2017**
Solomon Friedman: Aging, Fertility, and Sperm Storage in *Drosophila* Males
Yeshiva University
Direct research funds: \$800
- **Henry Kressel Research Scholarship** **2015-2016**
Yosef Frenkel: Phospholipid-derived signaling molecules in *Drosophila*
Yeshiva University
Direct research funds: \$800

Fellowships and Awards

- Lab featured on the Genetics Society of America's New Faculty Profiles **2016**
(genestogenomes.org/new-faculty-profile-josefa-steinhauer/)
- Yeshiva University Provost's Faculty/Student Summer Research Scholarship **2012-2016, 2018**
- F32 Ruth L. Kirchstein National Research Service Award For Individual Postdoctoral Fellows. National Institute of General Medical Sciences. F32GM079811 **2007-2008**
- Peter Sajovic Memorial Prize for a graduate student doing outstanding work in biology, Columbia University **2006**
- Publication featured in *Faculty of 1000* (Steinhauer and Kalderon *Development* 2005) **2005**
- National Science Foundation Graduate Research Fellowship award **2000-2003**
- Honorable mention, Predoctoral Fellowships in Biological Sciences of the Howard Hughes Medical Institute **2000**
- The Francis Hobart Herrick Prize for outstanding biological research and academic excellence in biology, Case Western Reserve University **1999**
- Barry M. Goldwater National University Student Scholarship **1997-1999**
- President's Academic Scholarship, Case Western Reserve University **1995-1999**

Publications

- **Steinhauer J[†]**, Statman B*, Borck J*, Fagan J, Edelman D*, and Jenny A.† Comover is required for spermatogenesis in *Drosophila*, independent of planar-cell polarity genes. *PLoS Genetics*. Submitted. **2018**
- Schonbrun A*, Eizadshenass S*, Lubin M*, Dechter A*, Ren M, Schlame M, and **Steinhauer J.†** Calcium-independent phospholipase A2 beta is required in neurons for normal lifespan and for survival of the female germline in *Drosophila*. *Molecular Biology of the Cell*. Submitted. **2018**

- Voices: Perspectives in teaching undergraduate genetics. Invited interview. *Trends in Genetics*. 34: 1–7, 79-85, 159-164, 247-252, 327-329. **2018**
- Kondo S, Vedanayagam J, Mohammed J, Eizadshenass S*, Pang N, Aradhya R, Siepel A, **Steinhauer J**, and Lai EC. New genes often acquire male-specific functions but rarely become essential in *Drosophila*. *Genes and Development*. 31:1841–1846. PMID: 29051389 **2017**
- **Steinhauer J**.† Co-culture activation of MAP kinase in *Drosophila* S2 cells. Invited contribution. *Methods in Molecular Biology: ERK signaling*. 1487:235-241. PMID: 27924571 **2017**
- **Steinhauer J**.† Separating from the pack: molecular mechanisms of *Drosophila* spermatid individualization. Invited review. *Spermatogenesis*. 5:2, e1041345. PMID: 26413413 **2015**
- Ben-David G*, Miller E*, and **Steinhauer J**.† *Drosophila* spermatid individualization is sensitive to temperature and fatty acid metabolism. *Spermatogenesis*. 5:1, e1006089. PMID: 26413411. Cover photo. **2015**
- **Steinhauer J**†, Liu HH, Miller E*, and Treisman JE. Trafficking of the EGFR ligand Spitz regulates its signaling activity in polarized tissues. *Journal of Cell Science*. 126(19): 4469-78. PMID: 23902690 **2013**
- Legent K, **Steinhauer J**, Richard M, Treisman JE. A Screen for X-Linked Mutations Affecting *Drosophila* Photoreceptor Differentiation Identifies Casein Kinase 1 α as an Essential Negative Regulator of Wingless Signaling. *Genetics*. 190(2):601-16. PMID: 22095083 **2012**
- **Steinhauer J**, Gijón MA, Riekhof W, Voelker DR, Murphy RC, Treisman JE. *Drosophila* lysophospholipid acyltransferases are specifically required for germ cell development. *Mol Biol Cell*. 20(24): 5224-5235. PMID: 19864461 **2009**
- **Steinhauer J** and Treisman JE. Lipid-modified morphogens: functions of fats. *Curr Opin Genet Dev*. 19: 1–7. PMID: 19442512 **2009**
- **Steinhauer J**† and Kalderon D. Microtubule polarity and axis formation in the *Drosophila* oocyte. *Dev Dyn*. 235(6): 1455-68. PMID: 16586443 **2006**
- **Steinhauer J** and Kalderon D. The RNA-binding protein Squid is required for the establishment of anteroposterior polarity in the *Drosophila* oocyte. *Development*. 132(24): 5515-25. PMID: 16291786. Featured in Faculty of 1000. **2005**
- **Steinhauer J**, Agha R, Pham T, Varga AW, Goldberg MB. The unipolar *Shigella* surface protein IcsA is targeted directly to the bacterial old pole: IcsP cleavage of IcsA occurs over the entire bacterial surface. *Mol Microbiol*. 32(2): 367-77. PMID: 10231492 **1999**

†Corresponding author

*Students trained in the Steinhauer lab

Invited Talks

-
- **Annual *Drosophila* Research Conference**. *Early career workshop*. Calcium independent phospholipase A2-beta is non-essential for somatic phospholipid metabolism but is required for maximal lifespan and fertility. **2018**
 - **Bernard Baruch College**. Phospholipids and their metabolism in fertility. **2017**
 - **Nerd Nite** at Le Poisson Rouge. Tall tales and small pox: the true story of the first vaccine. **2017**
 - **College of Mount Saint Vincent**. Phospholipids and their metabolites in fertility. **2017**
 - **NY Fly Eye Club**. Phospholipid-derived signals in *Drosophila* development and physiology. **2016**
 - **Rutgers Center for Lipid Research**, Rutgers University. The Lands Cycle in *Drosophila* development. **2016**
 - **NYU Medical Center**, Department of Cell Biology. Phospholipid-derived signals in *Drosophila* development and physiology. **2015**
 - **Undergraduate Student Research Presentations**, Yeshiva College. Lipid signaling in spermatogenesis. **2014**
 - **Nerd Nite** at Galapagos Art Space. Yo mama has so much adipose tissue. **2014**
 - **NY Fly Eye Club**. Trafficking of the EGFR ligand Spitz regulates its activity. **2013**
 - **Vassar College**. Cell-cell communication in the fruit fly: Processing and Presentation of an Epidermal Growth Factor Receptor Ligand. **2012**
 - **NYU Medical Center Fly Club**. Trafficking of the EGFR ligand Spitz to distinct membrane domains regulates signaling capacity in polarized tissues. **2012**
 - **Annual *Drosophila* Research Conference**. Trafficking of the EGFR ligand Spitz to distinct membrane domains regulates

- signaling capacity in polarized tissues. **2012**
- **Undergraduate Student Research Presentations**, Yeshiva College. Studying spermatogenesis in the fruit fly: *Drosophila* as a model for human fertility and cell biology. **2011**
 - **FASEB Summer Research Conference** on Protein Lipidation, Signaling and Membrane Domains. Presentation and Transport of EGFR Ligands in *Drosophila*. **2011**
 - **NYU Medical Center**, Department of Cell Biology. *Drosophila* lysophospholipid acyltransferases are specifically required for germ cell development. **2009**
 - **Skirball Institute Annual Retreat**. *Drosophila* lysophospholipid acyltransferases are specifically required for germ cell development. Presentation Award. **2009**
 - **Annual *Drosophila* Research Conference**. *squid* functions in AP axis determination in early and mid-oogenesis. **2005**
 - **Columbia University**, Department of Biological Sciences Department Mini-Symposium. RNA Binding Proteins and Microtubule Polarization: The Role of Squid in *Drosophila* Axis Formation. **2004**

Poster Presentations

- Eli Miller*, Geulah Ben-David*, Yosef Frenkel*, Sogol Eizadshenass*, and Josefa Steinhauer. **Seventh International Conference on Phospholipase A₂ and Lipid Mediators**. Fatty acid mediators are critical for male fertility in *Drosophila*. **2016**
- Yosef Frenkel*, Geulah Ben-David*, Eli Miller*, and Josefa Steinhauer. **Gordon Conference** on Molecular and Cellular Biology of Lipids. Phospholipase A₂ and phospholipid-derived signaling molecules in *Drosophila* spermatogenesis. **2015**
- Josefa Steinhauer, Rayshonda Williams, Marilyn Resh, and Jessica Treisman. **FASEB Summer Research Conference** on Protein Lipidation, Signaling and Membrane Domains. Presentation and Transport of EGFR Ligands in *Drosophila*. **2011**
- Josefa Steinhauer, Miguel Gijon, Wayne Riekhof, Dennis Voelker, Robert Murphy, and Jessica Treisman. **Annual *Drosophila* Research Conference**. *Drosophila* lysophospholipid acyltransferases are specifically required for germ cell development. **2010**
- Josefa Steinhauer, Miguel Gijon, Wayne Riekhof, Dennis Voelker, Robert Murphy, and Jessica Treisman. **Keystone Symposium on Complex Lipids: Signaling, Compartmentalization and Disease**. *Drosophila* lysophospholipid acyltransferases are specifically required for germ cell development. **2009**
- Josefa Steinhauer and Jessica Treisman. **Annual *Drosophila* Research Conference**. Regulated secretion of the EGFR ligand Spitz via palmitoylation and proteolysis. Honorable Mention. **2008**
- Josefa Steinhauer and Jessica Treisman. **Skirball Institute Annual Retreat**. Lipid Modification of Extracellular Signaling Ligands. Poster Award. **2008**
- Josefa Steinhauer and Jessica Treisman. **Gordon Conference** on Molecular and Cellular Biology of Lipids. Lipid Modification of Extracellular Signaling Ligands. **2007**
- Josefa Steinhauer, Lora Barnhart, and Daniel Kalderon. **Annual *Drosophila* Research Conference**. A Screen for Enhancers of the PKA Oogenesis Polarity Phenotype. **2003**

*Students trained in my lab

Student Presentations from my lab

- **Jacob Borck**. Reevaluating the role of the piRNA pathway in germline maintenance in *Drosophila*. Yeshiva College Honors Program Year End Dinner. Talk. **2018**
- **Yonatan Schwartz**. Fertility and sperm storage in aged *Drosophila* males. **Annual *Drosophila* Research Conference**. Poster. Victoria Finnerty Undergraduate Travel Award. **2018**
- **Matthew Lubin**. Calcium independent phospholipase A₂ –beta is non-essential for somatic phospholipid metabolism but is required for maximal lifespan and female fertility.

- Annual *Drosophila* Research Conference.** Poster. 2018
- New York Academy of Sciences Mitochondria in Health and Disease.** Poster. 2017
- **Solomon Friedman.** Fertility and sperm storage in aged *Drosophila* males. 2017
- Annual *Drosophila* Research Conference.** Poster. 2017
- Yeshiva College Honors Program Year End Dinner. Talk. 2017
- **Adina Wakschlag.** Null mutants for calcium independent phospholipase A₂ show normal male fertility but reduced female fertility. 2017
- Annual *Drosophila* Research Conference.** Poster. 2017
- Undergraduate Student Research Presentations, Yeshiva College. Talk. 2017
- Stern Undergraduate Research Group Exchange. Talk. 2017
- **Sogol Eizadshenass.** Phospholipases in *Drosophila* development. 2016
- Undergraduate Student Research Presentations, Yeshiva College. Talk. 2016
- **Yosef Frenkel.** Phospholipase A₂ and phospholipid-derived signaling molecules in *Drosophila* spermatogenesis. 2015
- Annual *Drosophila* Research Conference.** Poster. 2015
- Yeshiva College Honors Program Year End Dinner. Talk. 2016
- Undergraduate Student Research Presentations, Yeshiva College. Talk. 2015
- Yeshiva College Summer Research Student Seminar Series. Talk. 2015
- YU Undergraduate Research Abstracts Volume 8. Abstract. 2014-2015
- **Benny Statman.** Actin regulators in *Drosophila* spermatogenesis. 2015
- Yeshiva College Summer Research Student Seminar Series. Talk. 2015
- Yeshiva College Honors Program Year End Dinner. Talk. 2015
- **Eli Miller.** Lipid signaling in spermatogenesis. 2014
- Annual *Drosophila* Research Conference, PUI Workshop - selected talk.** 2014
- Annual *Drosophila* Research Conference.** Poster. 2014
- YU Undergraduate Research Abstracts Volume 7. Abstract. 2013-2014
- Yeshiva College Research Day. Poster. 2013
- **Ryan Fiter.** Determination of the role of cyst cells in *Drosophila* spermatogenesis using the GAL-4/UAS system. YU Undergraduate Research Abstracts Volume 7. Abstract. 2013-2014
- **Eli Miller.** Trafficking of the EGFR ligand Spitz regulates its activity. 2013
- Yeshiva College Summer Research Student Seminar Series. Talk. 2013
- YU Undergraduate Research Abstracts Volume 6. Abstract. 2012-2013
- **Geulah Ben-David.** Lipid signaling between soma and germline is required for *Drosophila* spermatogenesis. 2013
- Annual *Drosophila* Research Conference.** Poster. 2013
- Yeshiva College Summer Research Student Seminar Series. Talk. 2013
- Yeshiva College Research Day. Poster. 2012
- YU Undergraduate Research Abstracts Volume 6. Abstract. 2012-2013
- Stern College Women in Science Abstracts. Abstract. 2011-2012
- **Michael Goldstein.** Cell Junctions and Polarity in the *Drosophila* Testis. 2012
- Yeshiva College Summer Research Student Seminar Series. Talk. 2012

Community Service

- Organizer, NY Fly Eye Club 2017-present
- Panelist, Columbia University Biological Sciences Career Initiative 2014, 2017
- Peer review: *Cell Death and Disease*, *Scientific Reports*, *Oncotarget*, *Fly*, *BMC Cell Biology*, *Royal Society Open Biology*, *BMC Developmental Biology*, *Current Biology*, *Genetics* 2012-present
- Member, FlyBase Community Advisory Group 2014-present
- Organizer, Research and Pedagogy at Primarily Undergraduate Institutions Workshop, Annual *Drosophila* Research Conference 2014, 2015
- Member, Genetics Society of America 2005-present

University Service

- Yeshiva College Associate Dean search committee **2018**
- Yeshiva College faculty contact, *Pathways to Israel*: Graduate Study in the Biological Sciences and Biochemistry, Partnership with Technion University **2018-present**
- Yeshiva College Curriculum Committee **2017-present**
- Yeshiva College Biology department faculty search **2017, 2018**
- Nobel Prize Nanosecond presentation, Physiology and Medicine **2013, 2015, 2017**
- Marsha Stern Talmudical Academy Honors College Informational and Recruitment Talk **2015**
- University Security Committee **2013-present**
- Core curriculum **2014-2015**

Student Service

- Honors Thesis Mentor, Jacob Borck **2018**
- Honors Thesis Mentor, Yonatan Schwartz **2018**
- Honors Thesis and Kressel Fellowship Mentor, Solomon Friedman **2017**
- Honors Thesis and Kressel Fellowship Mentor, Yosef Frenkel **2016**
- Honors Thesis Mentor, Benjamin Statman **2015**
- Organizer, Summer Research Student Seminar Series **2013-2015**
- Introduction, YU Undergraduate Research Abstracts Volume 7 **2013-2014**
- Honors Thesis Reader (7 total) **2013-present**
- Applicant Interviewer, YC Honors Program (more than 20) **2012-present**
- More than 60 student letters of recommendation written

Department Service

- Supervisor, Lab specialist Danielle Wasserman **2017-2018**
- Assessment coordinator **2016-present**
- Manager, two epifluorescent microscopes and one confocal microscope **2013-present**
- Organizer and minutes, Biology department meetings **2013-present**
- Seven hosted seminar speakers **2013-2017**