Roshan A. Jain, Ph.D.
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EDUCATION

Ph.D., Princeton University, Princeton, NJ *2007*
Dissertation: A Characterization of the *Cis*-acting Signals and *Trans*-acting Factors Regulating *nanos* mRNA Localization

B.S., Cornell University, College of Agriculture and Life Sciences, Ithaca, NY *2000*
Honors Thesis: Characterization of *nirV* and a gene encoding a novel pseudoazurin in *Rhodobacter sphaeroides 2.4.3*
Graduated *summa cum laude*

RESEARCH EXPERIENCE

Assistant Professor *2015-present*
Department of Biology, Haverford College

Postdoctoral Fellow, Advisor: Dr. Michael Granato *2008-2015*
Department of Cell and Developmental Biology, University of Pennsylvania

Graduate Researcher, Advisor: Dr. Elizabeth R. Gavis *2001-2007*
Department of Molecular Biology, Princeton University

Undergraduate Honors Researcher, Advisor: Dr. James P. Shapleigh *1998-2000*
Department of Microbiology, Cornell University

Research Intern, Advisor: Dr. Richard Almon *1996-1998*
Department of Biological Sciences, State University of New York at Buffalo

FUNDING & AWARDS

Young Investigator Travel Award, International Behavioural and Neural Genetics Society *2019*
Travel Award, International Zebrafish Society *2019*
Haverford College Faculty Research Grant: *Combining High-Speed Behavioral Analysis with Live Imaging of Brain Activity.* *2018-2019*
Haverford College Faculty Research Grant: *Identification of Genes Regulating Decision-Making Through Next Generation Sequencing.* *2017-2018*
Koshland Integrated Natural Sciences Center Faculty Research Grant: *Establishing Optical Techniques for Dissecting Neural Function in Behavior.* *2016-2019*
Kirschstein-NRSA Fellowship, National Institutes of Health (Individual fellowship) *2010-2012*
Kirschstein-NRSA Fellowship, National Institutes of Health (Institutional Training Grant) *2008-2009*
DeLill Nasser Award for Professional Development in Genetics, Genetics Society of America *2008*
Dean's Fund for Scholarly Travel Award Recipient, Princeton University *2006*
Graduate Research Fellowship, National Science Foundation *2001-2004*
Graduate Excellence in Teaching Award, Princeton University *2001*
High Honors in Research for Undergraduate Thesis, Cornell University *2000*
Howard Hughes Undergraduate Research Scholar, Cornell University *1999*

TEACHING EXPERIENCE

Instructor, **Haverford College** *2015-present*
BIOL 200: Evolution, Genetics, & Genomics (Lab & Lecture)
BIOL 202: Unlocking Key Concepts in Biology
BIOL 301: Advanced Lab in Biology (“Superlab”)
BIOL 319: Molecular Neurobiology
BIOL 380: Independent Study in Biology for Juniors
BIOL 409: Senior Research Tutorial in Molecular Neurobiology
BIOL 480: Independent Study in Biology for Seniors

Guest Lecturer, Haverford College *2018*
Chesick Scholars Summer Course

Guest Lecturer, Haverford College *2018*
PSYC 218: Behavioral Neuroscience

Guest Lecturer, Haverford College *2017*
PSYC 217: Behavioral Neuroscience

Faculty, Woods Hole Marine Biology Laboratory *2010-2016*
Zebrafish Development & Genetics Course

Guest Lecturer, Princeton University *2015*
MOL 516: Genetics of Eukaryotic Organisms

Guest Lecturer & Teaching Assistant, Princeton University *2005*
MOL 507: Developmental Biology

Teaching Assistant, Princeton University *2003*
MOL 348: Cell and Developmental Biology

Laboratory Instructor, Princeton University *2001*
MOL 214: Introduction to Cellular and Molecular Biology Lab

MENTORED STUDENTS

Haverford College

Current Lab:

(1) Amalia Axinn ’21 – Biology Major
(2) Nicholas Roland ’21 – Biology Major
(3) Jordyn Greenbaum ’20 – Biology Major
(4) Leanne Ludwick ’20 – Biology Major
(5) Rory Seymour ’20 – Biology Major
(6) Rodrigo Zuniga Mouret ’20 – Biology Major, SACNAS Travel Award Winner

Lab Alumni*:*

(1) Federico Perelmuter ’21. English Major
(2) Sophia Nelson ’20, Velay Scholar, Biology Major.
(3) Arielle Schwartz ’20, Velay Scholar, Biology Major.
(4) Graham Peet ’19, KINSC Summer Scholar, Ariel G. Loewy Prize for Senior Research in Biology, “The Molecular and Circuit Mechanisms Underlying Simple Decision-Making and Learning in Larval Zebrafish.” Current research assistant at the University of Pennsylvania Children’s Hospital of Philadelphia.
(5) Tristan Reasor ’19, Chesick Scholar, “What is the role of *ap2s1* in the Neural Circuit of Habituation in Zebrafish?”
(6) Rory King ’18, “Investigation of the Neural Structures Critical for Zebrafish Decision-Making.”
(7) Santiago Laverde ’18, Chesick Scholar. “Determination of Lighting Preferences in *Danio rerio* Using a Light/Dark Preference Assay.”
(8) Claudia Nguyen ’18, “Exploring Stress and Its Effect on Decision-Making in Larval Zebrafish.” Current research assistant at Johns Hopkins Medical School.
(9) Jack Sollee ’18, Ariel G. Loewy Prize for Senior Research in Biology, “Optogenetics as a Tool for Investigating the Neurobiological Basis of Decision Making in Zebrafish.” Current research assistant at the Children’s Hospital of Pennsylvania.
(10) Christina Szi ’18, Chesick Scholar. “*ignorance is bliss*: Decoding the genetic control of learning.” Marian E. Koshland Prize in Biology. Current research assistant at Yale University.
(11) Amy Zamora ’18, Mathematics Major, Velay Scholar. “Computational approaches to quantify neural activity imaging data.” Current research scholar at the Institute for Systems Biology.
(12) Emilia Cobbs ’17, “Investigation of Glycinergic Neurons in Decision-making: *In vivo* Ca^{2+} Imaging of Inhibitory Neurons in Larval Zebrafish.” Current research assistant at New York University Langone Medical Center.
(13) Adedoyin Eisape ’17, “Characterizing the Role of *ap2s1* in the Behavioral Plasticity of the Acoustic Startle Response in *Danio rerio*.” Current Haverford House Fellow.
(14) Benjamin Miltenberg ’17, “Uncovering the Genetic Contribution to Decision-Making Behavior: using RNA-seq based bulked segregant analysis for zebrafish mutation mapping.” Current MD student at Tufts University.

(15) Keisuke Sawada '17, "Elucidating the Role of Calcium-Sensing Receptor in Regulating Acoustic Startle Response in Zebrafish." Current MD/PhD student at University of Cincinnati.
(16) Vivian Sun '17, "The Functional Role of *ap2s1* in Habituation and Decision-Making in Zebrafish Acoustic Startle Response." Current MA student at Stanford University.
(17) Kyle Albagli '16, "Genetic and Structural Characterization of Novel Decision-Making Genes in Zebrafish." Current MD student at Stony Brook University.
(18) Elizabeth Fishman '16, "Investigating Decision-Making in Larval Zebrafish (*Danio rerio*) Through Multi-Sensory Integration in the Startle Response Circuit." Current PhD student at UC Davis.
(19) Amanda Fleming '16, "Deciphering the Role of the Calcium-Sensing Receptor in Decision-Making Behavior in the Zebrafish."
(20) Lindsey Lopes '16, "Investigating the Role of the Stress Response in Decision-Making Using Larval Zebrafish." Current PhD student at Rockefeller University. NSF Graduate Research Fellowship, Marian E. Koshland Prize in Biology.
(21) George Ordiway '16, "Evaluating Zebrafish Pitch Perception via Acoustic Startle Response." Current PhD student at Northwestern University.

University of Pennsylvania
(1) Myra Eckenhoff (High School Student)
(2) Mariah Barstow (Undergraduate, Bates College)
(3) Hannah Bell (Technician), current MD/PhD student at University of Rochester
(4) Nikoia Federickson (Undergraduate, Lincoln College Summer of Excellence Fellow)
(5) Colleen Fehm (Undergraduate, University of Pennsylvania)
(6) Bercu Kement (Undergraduate, University of Pennsylvania)
(7) Kerri-Ann Limbeek (Undergraduate, University of Pennsylvania)
(8) Laura Liss (Technician)
(9) Lauren Schmidt (Technician)
(10) Kim Schnabel (Undergraduate, UT München)
(11) Julianne Skinner (Post-Baccalaureate Student)
(12) Rachel Monyak (Graduate Rotation Student)

Princeton University
(1) Maja Klosinska (Graduate Rotation Student)
(2) Dorothy Lerit (Graduate Rotation Student)

SERVICE AT HAVERFORD COLLEGE

Advisor: 22 Biology majors and 10 1st year & 2nd year students *2015-present*
Biology Faculty Representative: Search Committee for Tenure-Track Geneticist *2019*
Faculty Representative: Search Committee for Biology Lab Instructor *2018*
Faculty Representative: Educational Policy Committee *2017-2018*
Member: Pre-health Advisory Committee *2017-2018*
Biology Faculty Representative: Search Committee for Tenure-Track Microbiologist *2016*

PROFESSIONAL SERVICE

Course Coordinator: Woods Hole Marine Biology Zebrafish Development & Genetics Course *2020*
Ad-hoc Reviewer: *Biology Open, Current Psychopharmacology, Trends in Biotechnology, Developmental Biology*, *PLOS One*, *Behavioral Brain Research*, *Nature Communications, Journal of the American Association for Laboratory Animal Science,* Murdock Trust College Research Program for Natural Sciences *2012-present*
Panelist: Society for Neuroscience 2019 Meeting, Professional Development Workshop, "Getting Creative with Course-Based Research Experiences to Enhance Scholarship and Generate Publishable Data" *2019*
Expert Panelist: International Behavioural And Neural Genetics Society Meeting, Career Development Workshop *2019*
Invited Speaker: Princeton University Department of Molecular Biology Symposium: "Launching Your Career" *2017*
Associate Editor: International Zebrafish Society Newsletter *2017-present*
Invited Speaker: Haverford College, Panel on "Teaching With Technology: Mobile Devices and Tablets in the Classroom" *2017*
Invited Speaker: Children's Hospital of Pennsylvania, Panel on "Diversity in STEM: Career Opportunities for Doctoral Level Scientists" *2017*

Co-organizer: Mid-Atlantic Regional Zebrafish Meeting, Philadelphia PA	*2016*
Volunteer: Cornell Alumni Admissions Ambassador Network	*2012-2016*
Science Fair Mentor: iPraxis at Belmont Charter School	*2010-2015*
Judge: Belmont Charter School Science Fair	*2012-2014*
Instructor: Philadelphia School's K-12 Science Outreach Program, "Fishy Brains & Learning"	*2010-2014*
Judge: Penn Alexander Elementary School Science Fair	*2011-2013*
Science & Life Storyteller: First Person Arts	*2013*
Judge: Lea Elementary School Science Fair	*2011*
Coordinator: New Jersey Jr. High Regional Science Olympiads (Heredity)	*2007*
Invited Speaker: Scholars in Schools	*2004*

PUBLICATIONS

(Haverford College student author; *Undergraduate or postbaccalaureate student author)

(1) **Jain RA**, Wolman MA, Marsden KC, Nelson JC, Shoenhard H, Echeverry FA, Szi C ('18)*, Bell H*, Skinner J*, Cobbs EN ('17)*, Sawada K ('17)*, Zamora A ('18)*, Pereda AE, Granato M. A forward genetic screen in zebrafish identifies the G-protein coupled receptor *CaSR* as a modulator of sensorimotor decision-making. *Current Biology*. ***2018**, 28:1357-69.*

(2) Marsden KC, **Jain RA**, Wolman MA, Echeverry F, Nelson JC, Hayer KE, Miltenberg B ('17)*, Pereda AE, Granato M. A Cyfip2-dependent excitatory interneuron pathway establishes the innate startle threshold. *Cell Reports*. ***2018**, 23:878-87.*

(3) Hoffman EJ, Turner KJ, Fernandez JM, Cifuentes D, Ghosh M, Ijaz S, **Jain RA**, Kubo F, Bill BR, Baier H, Granato M, Barresi MJF, Wilson SW, Rihel J, State MW, Giraldez AJ. Estrogens Suppress a Behavioral Phenotype in Zebrafish Mutants of the Autism Risk Gene, *CNTNAP2*. *Neuron. **2016**, 89(4):725-33.*
Highlighted in Biran & Levkowitz (2016) "Zebrafish Reel in Phenotypic Suppressors of Autism." *Neuron. **2016,** 89(4):673-5.*

(4) Wolman MA, **Jain RA**, Marsden K, Bell H*, Skinner J*, Hayer K*, Hogenesch J, Granato M. A genome wide screen identifies PAPP-AA-mediated IGFR signaling as a novel regulator of habituation learning. *Neuron. **2015** 85(6):1200-11*.
Highlighted in Ardiel & Rankin (2015) "Casting a Genome-wide Net for Learning Mutants." *Neuron. **2015**, 85(6):1147-8*.

(5) **Jain RA**, Bell H*, Lim A, Chien CB, Granato M. Mirror movement-like defects in startle behavior of zebrafish *dcc* mutants are caused by aberrant midline guidance of identified descending hindbrain neurons. *J Neuroscience. **2014**, 34(8):2898-909.*

(6) Lakhina V, Marcaccio C, Shao X, Lush M, **Jain RA**, Fujimoto E, Bonkowsky J, Granato M, Raper J. Netrin/DCC signaling guides olfactory sensory axons to their correct location in the olfactory bulb. *J Neuroscience. **2012**, 32(13):4440-56.*

(7) **Jain RA**, Wolman MA, Schmidt LA*, Burgess HA, Granato M. Molecular-genetic mapping of zebrafish mutants with variable phenotypic penetrance. *PLoS One. **2011**, 6(10):e26510.*

(8) Wolman MA, **Jain RA**, Liss LE*, Granato M. Chemical modulation of memory formation in larval zebrafish. *PNAS. **2011**, 108(37):15468-73.*

(9) Sinsimer K, **Jain RA**, Chatterjee S, Gavis ER. A late phase of germ plasm accumulation during *Drosophila* oogenesis requires Lost and Rumpelstiltskin. *Development. **2011**, 138(16):3431-40.*

(10) **Jain RA**, Gavis ER. The *Drosophila* hnRNP M homolog, Rumpelstiltskin, regulates *nanos* mRNA localization. *Development. **2008**, 135(5):973-982.*

(11) Forrest KM, Clark IE, **Jain RA**, Gavis ER. Temporal complexity within a translational control element in the *nanos* mRNA. *Development. **2004**, 131:5849-57.*

(12) **Jain R**, Shapleigh JP. Characterization of *nirV* and a gene encoding a novel pseudoazurin in *Rhodobacter sphaeroides* 2.4.3. *Microbiology. **2001**, 147, 2505-2515.*

INVITED ORAL PRESENTATIONS

(1) 4th International Symposium on The Extracellular Calcium-Sensing Receptor, Platform Session, March 2020. San Francisco, CA.
(2) 21st Annual Genes, Brain, & Behavior Meeting, Platform Session, May 2019. Edinburgh, UK.
(3) Champalimaud Center for the Unknown, Vision to Action Group Meeting, April 2019. Lisbon, Portugal.
(4) 8th Strategic Conference of Zebrafish Investigators, Neural Circuits and Behavior Platform Session, January 2019. Pacific Grove CA.
(5) North Carolina State University, W. M. Keck Center for Behavioral Biology Seminar Series, January 2019. Raleigh, NC.
(6) Ecole des Neurosciences Paris Île-de-France Seminar Series, Centre Universitaire des Saints-Pères, December 2018. Paris, France

(7) 5th Paris NeuroZebrafish Meeting, Muséum National Histoire Naturelle, Sorbonne Universités, November 2018. Paris, France.
(8) Batiment Institut Curie, Research Presentation, September 2018. Paris, France.
(9) National Institutes of Health International Workshop on Zebrafish Neural Circuits and Behavior, Platform Session, 2017. Bethesda, MD.
(10) Howard Hughes Medical Institution, Janelia Farms Conference: Action Selection in the Animal Kingdom, Platform Session, 2016. Ashburn, VA.
(11) The Allied Genetics Conference: International Zebrafish Meeting, Platform Session, 2016. Orlando, FL.
(12) University of Pennsylvania Zebrafish Meeting Research Presentation, 2016. Philadelphia, PA.
(13) Villanova University Department of Biology Symposium, 2016. Villanova, PA.
(14) Summer Mid-Atlantic Regional Zebrafish Meeting, Platform Session, 2015. New York City, NY.
(15) Princeton University Developmental Biology Symposium, 2014. Princeton, NJ.
(16) Cold Spring Harbor Laboratory Meeting: Axon Guidance, Synapse Formation and Regeneration, Platform Session, 2012. Cold Spring Harbor, NY.
(17) Mid-Atlantic Regional Zebrafish Meeting, Platform Session, 2011. Baltimore, MD.
(18) Gordon Research Conference: Genes & Behavior, "Data Blitz" Presentation, 2010. Ventura, CA.
(19) 48th Annual Drosophila Research Conference, Platform Session, 2007. Philadelphia, PA.
(20) 47th Annual Drosophila Research Conference, RNA Biology Workshop, 2006. Houston, TX.

SELECTED CONFERENCE POSTER PRESENTATIONS
(Underline: Haverford College student)

(1) Peet GC ('19), Reasor T ('19), **Jain RA**. "The Role of *ap2s1* in the Modulation of Habituation Learning." *Spring Mid-Atlantic Zebrafish Meeting*, Apr 2019. Baltimore, MD.
- Poster was also selected for an oral presentation by Graham Peet ('19)

(2) Schultz A ('20), Zuniga R ('20), **Jain RA**. "Investigating regulation of habituation by *ap2s1* in zebrafish." *Winter Mid-Atlantic Zebrafish Meeting*, Dec 2018. Philadelphia, PA.
(3) Zuniga R ('20), Schultz A ('20), **Jain RA**. "Uncovering the genes behind basic learning." *Winter Mid-Atlantic Zebrafish Meeting*, Dec 2018. Philadelphia, PA.
(4) Peet GC ('19), **Jain RA**. *Winter Mid-Atlantic Zebrafish Meeting*, Dec 2018. Philadelphia, PA.
(5) **Jain RA,** Wolman MA, Marsden KC, Szi C ('18), Peet GC ('19), Rajan G, Del Bene F, Granato M. "The Calcium Sensing GPCR CaSR modulates larval sensorimotor decision-making." *The 5th Conference on Imaging Structure & Function of the Zebrafish Brain*, 2018. Brighton, United Kingdom.
(6) Zuniga R ('20), Schultz A ('20), **Jain RA**. "Uncovering the genes behind basic learning." *SACNAS 2018: The National Diversity in STEM Conference,* 2018. San Antonio, TX.
(7) Szi C ('18), Zamora AD ('18), Marsden, KC, **Jain RA.** "*ignorance is bliss:* Decoding the genetic control of learning." *13th International Zebrafish Conference*, 2018. Madison, WI.
(8) Meserve J, **Jain RA**, Marsden K, Nelson J, Wolman M, Granato M. "Model behavior in zebrafish: characterization of the startle response." *13th International Zebrafish Conference*, 2018. Madison, WI.
(9) Ortiz E, Miltenberg B ('17)**,** Nelson J, **Jain RA**, Marsden K, Granato M. "Molecular-genetic mechanisms underlying establishment of the acoustic startle threshold." *13th International Zebrafish Conference*, 2018. Madison, WI.
(10) Szi C ('18), Zamora AD ('18), **Jain RA.** "*ignorance is bliss:* Decoding the genetic control of learning." *Spring Mid-Atlantic Zebrafish Meeting*, 2018. Hershey, PA.
- Poster was selected for a "Lightning Talk" oral presentation by Christina Szi ('18)

(11) Ortiz E, Miltenberg B ('17), Nelson JC, **Jain RA**, Marsden KC, Granato M. "Molecular-genetic mechanisms underlying establishment of the acoustic startle threshold." *Neuronal Circuits Meeting*, 2018. Cold Spring Harbor Labs, NY
(12) Szi C ('18), King R ('18), Reasor T ('19), **Jain RA.** "*ignorance is bliss*: Decoding the genetic control of learning." *Fall Mid-Atlantic Zebrafish Meeting,* 2017. New York, NY.
(13) Ordiway GB ('16), **Jain RA.** "Evaluating Zebrafish Pitch Perception via Acoustic Startle Response." *The Allied Genetics Conference*: *International Zebrafish Meeting,* 2016. Orlando, FL.
(14) Albagli K ('16), **Jain RA.** "Genetic and Structural Characterization of Novel Decision-Making Genes in Zebrafish." *Spring Mid-Atlantic Zebrafish Meeting,* 2016. Philadelphia, PA.
(15) Lopes L ('16), **Jain RA.** "Investigating the Role of the Stress Response in Decision-Making Using Larval Zebrafish." *Spring Mid-Atlantic Zebrafish Meeting,* 2016. Philadelphia, PA.
(16) **Jain RA**, Wolman MA, Marsden K, Bell H, Hayer K, Hogenesch J, Granato M. "Genetics and pharmacogenetics of simple vertebrate decision-making." *44th Annual Society for Neuroscience Conference,* 2014. Washington, DC.

(17) **Jain RA**, Wolman MA, Marsden K, Bell H, Hayer K, Hogenesch J, Granato M. "Genetics and pharmacogenetics of reflexive decision-making." *11th International Zebrafish Development and Genetics Conference,* 2014. Madison, WI.
(18) **Jain RA**, Wolman MA, Marsden K, Bell H, Granato M. "Forward genetic dissection of acoustic startle behavioral performance and plasticity." *10th International Zebrafish Development and Genetics Conference,* 2012. Madison, WI.
(19) **Jain RA**, Wolman MA, Marsden K, Bell H, Schmidt L, Granato M. "Genetic analysis of simple learning behavior in vertebrates." *Neuronal Circuits Meeting,* 2012. Cold Spring Harbor Labs, NY.
(20) **Jain RA**, Granato M. "The Deleted in Colorectal Cancer (DCC) guidance receptor coordinates fast turning behaviors." *Axon Guidance, Synapse Formation and Regeneration Meeting,* 2010. Cold Spring Harbor Labs, NY.
(21) **Jain RA**, Granato M. "The role of the *spaced out* gene in modulating larval startle behavior." *9th International Zebrafish Development and Genetics Conference,* 2010. Madison, WI.
(22) **Jain RA**, Wolman MA, Liss LE, Clark KJ, Ekker SC, Granato M. "Genetic analysis of simple learning behavior in vertebrates." *Gordon Research Conference: Genes & Behavior,* 2010. Ventura, CA.
(23) **Jain RA**, Gavis ER. "Regulation of *nanos* mRNA by *Drosophila* hnRNP M." *48th Annual Drosophila Research Conference,* 2007. Philadelphia, PA.

PROFESSIONAL AFFILIATIONS

Faculty of Undergraduate Neuroscience (FUN)
Genetics Society of America (GSA)
International Zebrafish Society (IZFS)
Society for Neuroscience (SfN)
International Behavioural and Neural Genetics Society (IBANGS)