
CATHERINE S. SCHRANKEL, Ph.D.

Curriculum Vitae June 2022

San Diego State University
Department of Biology
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I study cellular defense systems, how they become active during animal embryogenesis, and how these systems function during interactions with gut microbes and anthropogenic pollutants. I am committed to a career in scientific research and teaching. A primary goal of my work is to engage and recruit students from traditionally underserved communities into academic research experiences in STEM. I bring a unique teaching expertise in the topics of Cell and Developmental Biology, Toxicology, Immunology, and CRISPR Gene-Editing.

EDUCATION

- 2017 Ph.D, Immunology:** University of Toronto, Toronto ON, Canada
Advisor: Dr. Jonathan Rast. GPA 4.0 (A+)
Thesis: Gene regulatory control of immune cell specification and differentiation in the sea urchin embryo and larva.
- 2010 M.Sc., Biological Sciences:** The George Washington University, Washington, DC
Advisor: Dr. L Courtney Smith. GPA 3.70 (A)
Binding Studies of the Sp185/333 Proteins of the Purple Sea Urchin, Strongylocentrotus purpuratus: Implications of Diversity in the Function of a Novel Protein Family.
- 2009 B.Sc., Biological Sciences,** The George Washington University, Washington, DC
Advisor: Dr. L Courtney Smith. GPA 3.37 (A-)
The Function of 185/333 Proteins in the Immune System of the Purple Sea Urchin.

APPOINTMENTS

August 16th 2022 **Incoming Assistant Professor of Cell Biology**
San Diego State University, Department of Biology
San Diego, CA

July 1st - August 15th 2022 **Adjunct Assistant Professor of Cell Biology**
SDSU Department of Biology
San Diego, CA

June 2017–July 2022 **NIH Ruth L. Kirschstein Postdoctoral Fellow**
Scripps Institution of Oceanography: University of California, San Diego
San Diego, CA (Advisor, Dr. Amro Hamdoun)

PUBLICATIONS

PRIMARY LITERATURE AND METHODS PAPERS. **Post-Doctoral work (n=5)

1. Vyas H, **[Schrankel CS](#), Espinoza JA, Mitchell KL, Nesbit KT, Jackson E, Chang N[^], Lee Y, Warner J, Reitzel A, Lyons DC, Hamdoun A. (2022) **Generation of a homozygous mutant drug transporter (ABCB1) knockout line in the sea urchin *Lytechinus pictus*.** *Development*. 2022 Jun 1;149(11):dev200644. doi: 10.1242/dev.200644. Epub 2022 Jun 6. PMID: 35666622. [^] *mentored Master's student*
2. **[Schrankel CS](#) and Hamdoun A. (2021) **Early patterning of *ABCB*, *ABCC*, and *ABCG* transporters establishes unique territories of small molecule transport in the embryonic mesoderm and endoderm.** *Dev Biol*. 472:115-124. Doi: 10.1016/j.ydbio.2020.12.021. PMID: 33460641; PMCID: PMC8171262.
3. **[Schrankel CS](#)¹, Fleming TJ^{1^}, Vyas H¹, Rosenblatt HD, and Hamdoun A. (2021) **CRISPR/Cas9 mutagenesis reveals a role for *ABCB1a* in protection of sea urchin embryos from pathogenic gut bacteria.** *J Exp Biol*. 224(7):jeb232272. doi: 10.1242/jeb.232272. PMID: 33653719; PMCID: PMC8077557. ¹ *co-first author*; [^] *mentored undergraduate*
4. Schuh NW, Carrier TJ, [Schrankel CS](#), Reitzel AM, Heyland A, and Rast JP. (2020) **Bacterial exposure mediates developmental plasticity and resistance to lethal *Vibrio lentus* infection in purple sea urchin (*Strongylocentrotus purpuratus*) larvae.** *Front Immunol*. 10:3014. doi:10.3389/fimmu.2019.03014
5. **[Schrankel CS](#), Gökirmak T, Lee CW, Chang G, and Hamdoun A. (2019) **Generation, expression and utilization of single-domain antibodies for *in-vivo* protein localization and manipulation in sea urchin embryos.** In: Hamdoun A, Foltz KR, editors: *Methods in Cellular Biology, Volume 151*. PMID: 30948018
6. Buckley KM*, Ho EC*, Hibino T, [Schrankel CS](#), Schuh N, Wang G, Rast JP. (2017) **IL-17 is the primary factor expressed in the gut epithelium during an invertebrate inflammatory response.** *Elife*. doi: 10.7554/eLife.23481. PMID 28447937 *co-first author.
7. [Schrankel CS](#), Solek CM, Buckley KM, Anderson MK, Rast JP. (2016) **A conserved alternative form of the purple sea urchin *HEB/E2-2/E2A* transcription factor mediates a switch in E-protein regulatory state in differentiating immune cells.** *Dev Biol*. 416(1):149-61. PMID 27265865
8. Ho EC*, Buckley KM*, [Schrankel CS](#), Schuh NW, Hibino T, Solek CM, Bae K, Wang G, Rast JP. (2016) **Perturbation of gut bacteria induces a coordinated cellular immune response in the purple sea urchin larva.** *Immunol Cell Biol*. 94(9):861-874. PMID 27192936. *co-first author
9. Solek CM, Oliveri P, Loza-Coll M, [Schrankel CS](#), Ho EC, Wang G, Rast JP. (2013) **An ancient role for *Gata-1/2/3* and *Scl* transcription factor homologs in the development of immunocytes.** *Dev Biol*. 382(1):280-92. PMID 23792116

10. Lun CM, Schrankel CS, Chou HY, Sacchi S, Smith LC. (2016) **A recombinant Sp185/333 protein from the purple sea urchin has multitasking binding activities towards certain pathogens and PAMPs.** *Immunobiology*.221(8):889-903. PMID: 27020848
11. Sherman LS, Schrankel CS, Brown KJ, Smith LC. (2015) **Extraordinary Diversity of Immune Response Proteins among Sea Urchins: Nickel-Isolated Sp185/333 Proteins Show Broad Variations in Size and Charge.** *PLoS ONE*. 25;10(9). PMID: 26406912.

BOOK CHAPTERS AND REVIEWS

12. **Hamdoun A, Schrankel CS, Nesbit K, Espinoza JE. (2018) **Sea urchins as lab animals for reproductive and developmental biology.** In: Skinner M, Swanson P, editors. *Encyclopedia of Reproduction, Second Edition*. San Diego: Academic Press.
13. Smith LC, Arriza V, Barela Hudgell MA, Barone G, Bodnar AG, Buckley KM, Cunsolo V, Dheilly N, Franchi N, Fugmann SD, Furukawa R, Garcia-Araras J, Henson JH, Hibino T, Irons ZH, Li C, Lun CM, Majeske AJ, Oren M, Pagliara P, Pinsino A, Raftos DA, Rast JP, Samasa B, Schillaci D, Schrankel CS, Stabili L, Stensvåg K, Sutton E. (2018) **Complexity of the Immune System in Echinoderms.** In: Cooper EL, editor. *Comparative Immunology*. Springer Publisher. All equal contributors.
14. Ghosh J, Lun CM, Majeske AJ, Sacchi S, Schrankel CS, Smith LC. (2011) **Invertebrate immune diversity.** *Dev Comp Immunol*.35(9):959-74. PMID: 21182860. All equal contributors.
15. Smith LC, Ghosh J, Buckley KM, Clow LA, Dheilly NM, Haug T, Henson JH, Li C, Lun CM, Majeske AJ, Matranga V, Nair SV, Rast JP, Raftos DA, Roth M, Sacchi S, Schrankel CS, Stensvag K. (2010) **Echinoderm immunity.** In *Adv Exp Med Biol*. PMID 21528703. All equal contributors.

FELLOWSHIPS, AWARDS and HONORS

Postdoctoral:

- Nov 2019** **Company of Biologists Scientific Meeting Grant, £2000**
Schrankel CS and Rast JP
Symposium: Animal immunity at the interface of development and the microbial environment
 8th Meeting of the European Society for Evolutionary and Developmental Biology
 Naples, Italy. July 2020 **Rescheduled to May 2022
- June 2019** **European ASSEMBLE Grant**
“Comparative studies on xenobiotic metabolism in tunicates”
 Hamdoun A and Schrankel CS.
 Host: Institute de la Mer Villefranche. Villefranche, France. June-July 2019.
- Aug 2018** **Ruth L. Kirschstein National Research Service Award. \$130,000**
“Identifying the ABCs of xenobiotic metabolism in protecting the germ line lineage” Dec 2018 to Nov 2021; 1-year COVID extension 03/2022 to 02/2023.
 National Institute of Environmental Health Sciences, National Institute of Health.

- Dec 2018** **Runner-up, Elevator Speech.** American Society of Cell Biology | EMBO Meeting.
- April 2018** **Nominated, Governor General Gold Medal.** Department of Immunology, U of T
- Mar 2018** **Best Poster Bulletin, €280.** 7th FEBS Meeting on ABC Proteins. Innsbruck, Austria.

Graduate and Undergraduate:

- Apr 2017** **Plenary Speaker Travel Award, \$480:** Marine Biological Laboratory 24th Meeting of the Developmental Biology of the Sea Urchin. Woods Hole, MA.
- Jan 2017** **Doctoral Completion Award, \$9,022:** Department of Immunology, U of Toronto.
- Dec 2016** **Hardi Cinader Award, \$700.** Annual award to one graduating student for outstanding achievements in research and a broad interest in the sciences and the arts. Department of Immunology, University of Toronto.
- June 2016** **CIHR Gold Level Poster Award, \$500.** Canadian Institute of Health Research (CIHR) Poster Competition, Top award category. 29th Canadian Student Health Research Forum (CSHRF). Winnipeg, MB, Canada.
- Mar 2016** **CSHRF Conference Bursary, \$750:** Nominated and selected for CIHR-supported registration by the Department of Immunology, University of Toronto.
- Oct 2015** **Scholarship, \$1,315.** Gene Regulatory Networks for Development Course Marine Biological Laboratory.
- Sept 2015** **Research Fellowship, \$40,931:** Department of Immunology, University of Toronto. Departmental award for full stipend and international tuition fees. (09/2015 - 05/2016)
- Mar 2013** **CiscoTech Case Competition \$1,500:** Cisco Systems Canada Co. Case Competition Women in Science and Engineering Conference. Toronto ON, Canada.
- Nov 2012** **Conference Travel Grant, \$810:** School of Graduate Studies, University of Toronto.
- April 2012** **National Finalist, Vanier Canada Graduate Scholarship, \$50,000:** National Sciences and Engineering Research Council.
- April 2011** **Conference Grant, \$375:** School of Graduate Studies, University of Toronto.
- May 2010** **Graduate Research Fellowship, \$6,000:** Department of Biological Sciences, The George Washington University (GWU). (05/2010 - 08/2010)
- March 2010** **Travel Award, \$300:** Comparative Immunology Symposium, Florida International University.
- Sept 2009** **Graduate Teaching Assistant Fellowship, \$1,900:** Department of Biological Sciences, GWU. (09/2009 - 12/2009)
- June 2009** **Travel Bursary, \$750:** Society for Developmental and Comparative Immunology **Scholarship, \$500:** Enosinian Research Society, GWU.

- Travel Award, \$500:** Columbian College of Arts and Sciences, GWU.
- May 2008 NSF Undergraduate Summer Research Fellowship, \$4,000:** GWU
- Sept 2005 Scholarship, \$1000:** Federal Employees Education and Assistance Fund, Washington, D.C.

INVITED ACADEMIC PRESENTATIONS

Postdoctoral:

- Jun 2022** Illuminating the role of drug transporters in host-microbe interactions.
[Plenary Seminar]
Symposium: Animal immunity at the interface of development and the microbial environment
 8th Meeting of the European Society for Evolutionary and Developmental Biology
 Naples, Italy
- Apr 2022** Drug transporters in embryo-environment interactions. **[Plenary Seminar]**
 26th Meeting of the Developmental Biology of the Sea Urchin. (Virtual)
- Mar 2021** Imaging the ontogeny and activity of small molecule transporters in gut epithelia.
[Invited Future Investigator Presentation]
 4D Cellular Physiology Workshop: *Epithelial Biology*
 Janelia Research Campus (Virtual)
- Feb 2021** Small molecule transporters in development and host-environment interactions.
[Invited Departmental Seminar]
 University of South Carolina. Department of Environmental Health (Virtual)
- Oct 2020** Spatial patterning and CRISPR/Cas9 mutagenesis of small molecule transporters: A role for ABCB1 in the protection of sea urchin embryos against *Vibrio* bacteria.
 Oceans and Human Health, Virtual Meeting.
- Oct 2019** Patterning and activity of multidrug ABC transporters during embryogenesis.
 5th Congress of the Meredith Gould Symposium. Ensenada, Mexico.
- July 2019** Patterned expression and activity of ABC Transporters during embryogenesis.
[Invited Institutional Seminar]
 Institute de la Mer Villefranche. Villefranche, France.
- May 2019** Patterned expression of cellular defense systems in the sea urchin embryo.
[Plenary Seminar]
 Guest Symposium: *Deuterostome Immune Innovations from Echinoderms to Mammals*
 American Association of Immunology 2019 Meeting. San Diego, CA.
- Oct 2018** Patterned expression and activity of ABC Transporters during gut morphogenesis. **[Plenary Seminar]**
 25th Meeting of the Developmental Biology of the Sea Urchin. Woods Hole, MA.

- Mar 2018** ABC Transporters are differentially regulated during gut development and gut epithelial immune responses. [**Lightning Poster Presentation; winner**]
- Oct 2017** 7th FEBS Special Meeting on ABC Proteins. Innsbruck, Austria.
ABC Transporters are differentially regulated during development.
4th Congress of the Meredith Gould Symposium. Ensenada, Mexico.

Graduate and Undergraduate:

- April 2017** The MACPF gene family in the sea urchin and beyond. [**Plenary Seminar**].
24th Meeting of the Developmental Biology of the Sea Urchin. Woods Hole, MA.
- July 2016** Larval immunity and the role of E-proteins in immunocyte development in the purple sea urchin. [**Invited Institutional Seminar**]
Department of Biological Sciences, GWU. Washington, DC.
- June 2016** A conserved alternative form of the purple sea urchin HEB/E2-2/E2A transcription factor mediates a switch in E-protein regulatory state in differentiating immune cells.
6th North American Comparative Immunology Workshop. Charlottetown, PEI. Canada.
- Oct 2015** Conserved alternative forms of E-protein transcription factors function in immune cell development in the sea urchin embryo.
23rd Meeting of the Developmental Biology of the Sea Urchin. Woods Hole, MA.
- Apr 2014** A gene regulatory network model for the development of immune cells in the purple sea urchin embryo.
22nd Meeting of the Developmental Biology of the Sea Urchin. Woods Hole, MA.
- June 2012** Ancient roles of hematopoietic factors revealed in sea urchin immunocyte development. 3rd North American Comparative Immunology Workshop.
Rochester, NY.
- Mar 2010** The highly diverse Sp185/333 proteins of the purple sea urchin, *S. purpuratus*, exhibit bacterial binding properties. (Undergraduate)
Florida International University Comparative Immunology Symposium. Miami, Florida.
- July 2009** The 185/333 proteins of the purple sea urchin, *S. purpuratus*, bind bacteria.
11th Congress of the International Society for Developmental and Comparative Immunology. Prague, Czech Republic. (Undergraduate)

CONFERENCE PARTICIPATION: Selected poster presentations

Postdoctoral:

- July 2020** Spatiotemporal patterning of *ABCB*, *ABCC*, and *ABCG* small molecule transporters during development
79th Annual Meeting of Society of Developmental Biology. (Virtual)
- July 2019** Patterned expression and activity of ABC transporters during gut morphogenesis.
10th International Tunicate Meeting. Villefranche, France.

- Dec 2018** Patterned expression of ABC transporters during gut morphogenesis and immune responses. **[Runner-up, Best Elevator Talk]**
American Society for Cell Biology-EMBO 2018 Meeting. San Diego, CA.
- Mar 2018** ABC Transporters are differentially regulated during gut development and gut epithelial immune responses. **[Winner, Best Lighting Talk Presentation]**
7th FEBS Special Meeting on ABC Proteins. Innsbruck, Austria.
- Oct 2017** ABC Transporters are differentially regulated during development.
4th Congress of the Meredith Gould Symposium. Ensenada, Mexico.

Graduate and Undergraduate:

- June 2016** Conserved alternative forms of E-protein transcription factors: Lessons learned from basic animal models of hematopoiesis” **[Gold Level Best Poster winner]**
29th Canadian Student Health Research Forum, CIHR Poster Competition.
Winnipeg, Manitoba. Canada.
- June 2015** Conserved alternative forms of E-protein transcription factors function in immune cell development in the sea urchin embryo.
5th North American Comparative Immunology Workshop. Toronto, ON. Canada.
- Oct 2012** Characterizing molecular markers for immunocyte lineages in the embryo and larva of *S. purpuratus*.
21st Meeting of the Developmental Biology of the Sea Urchin. Woods Hole, MA.
- April 2011** Immunocyte differentiation in the sea urchin larva.
20th Meeting of the Developmental Biology of the Sea Urchin. Woods Hole, MA.
- July 2008** The role of 185/333 proteins in the immune system of the purple sea urchin.
National Science Foundation Undergraduate Research Symposium at The George Washington University. Washington, D.C.

MENTORSHIP and TEACHING EXPERIENCE

Postdoctoral:

Mentor: Undergraduate (3), Masters (2), and PhD (3) students

Scripps Institution of Oceanography, UCSD.

06/2017 to present

- Aug 2021 to present: **Mentoring PhD students** Evan Tjeerdema and Svenja Kling in basic molecular lab techniques, sea urchin fertilization and culturing, generation and maintenance of transgenic sea urchin lines, whole mount in-situ hybridization (ISH), confocal microscopy; FIJI and Adobe Creative Suite; graduate fellowship applications (NSF; Boehringer Ingelheim-Fonds PhD Fellowships).
- Sept 2021 to Dec 2021: Designed and ran a **gene annotation and ISH “bootcamp”** for 6 MSc/PhD students in the Hamdoun and collaborators’ lab (Lyons Lab): Annotation of *L.pictus* genes from 2nd genome assembly; ISH probe design, cloning and labeling, embryo fixation and ISH (alkaline phosphatase “purple” staining and fluorescent staining); imaging.
- Jan 2021 to present: **Mentoring BS/MSc students** Nathan Chang and Kathy Le in basic molecular biology lab techniques, sea urchin fertilization and culturing, generation and

maintenance of transgenic sea urchin lines, ISH, microscopy; FIJI and Adobe Creative Suite; writing scholarship proposals and primary data publications on the expression and localization of nuclear hormone receptors; graduate level fellowships and PhD applications. Nathan was awarded a competitive **\$3000 SIO Masters Scholarship** (May 2021). Nathan has applied to PhD programs and the **Ford Foundation Graduate Fellowship** (3 years) to **pursue PhD studies** in developmental toxicology starting Fall 2022.

- Oct 2020 to present: Mentoring **PhD student** Yoon Le in basic lab techniques, sea urchin fertilization, culturing, ISH; writing manuscripts and scholarship proposals. Current manuscript (his first author) focus: scRNA-Seq identification of developmental cell “activity states” governed by small molecule transport capabilities (target submission Feb 2022).
- June 2017 to June 2020: **Mentored undergraduate** Travis Fleming (2nd to 4th year) in basic lab techniques, sea urchin fertilization and culturing, CRISPR/Cas9 gene editing, live-cell ABC transporter assays, confocal microscopy; FIJI and Adobe Creative Suite; two conference presentations, undergraduate and graduate fellowship applications, graduate school applications, and co-first author manuscript preparation (Fleming et al, *JEB* 2021). Travis was awarded the UCSD Triton Research and Experiential Learning Scholars (**TRELS**) **research scholarship** (\$1000) for 6 consecutive academic Quarters (2 years + summers), and an **NSF Graduate Fellowship** (3 years) to pursue **PhD studies at Harvard University**, started Sept 2020.
- Jan 2019 to Jan 2020: **Mentored freshman undergraduate** Isabelle Danforth in basic lab techniques, sea urchin fertilization, culturing, bacterial exposure, live microscopy and ISH; writing scholarship proposals and research posters on the effects of microbial environmental exposures on the expression of ABC transporters during development. Isabelle was awarded the **TRELS scholarship** for the 2019 Spring Quarter (\$1000) and **The David Marc Belkin Memorial Research Scholarship** for Environment and Ecology for 2019 summer research (\$5000); presented in two **undergraduate research conferences** in 2019.
- Sept to Dec 2019: Mentored visiting **Master’s student**, Svenja Kling from University of Heidelberg: Sea urchin fertilization, culturing, feeding and bacterial exposure protocols; live and fixed imaging of embryos and larvae; *in-situ* hybridization; CRISPR/Cas9 gene-editing. Svenja is now continuing this work as a PhD student in the Hamdoun Lab since Sept 2021.
- 2017-2018: Mentored **undergraduate Hannah Rosenblatt** in manuscript preparation and graduate school applications. Hannah is currently a **PhD student at Stanford University**.

Educator, The Reproductive and Onco-fertility Science Academy (ROSA)

Scripps Institution of Oceanography, La Jolla, CA.

July 2017 to present.

Annual hands-on summer science program for ethnically and socioeconomically diverse 10th to 12th grade women from the greater San Diego area; develop and mentor a lab activity on fertilization and early development; Run a Q&A session on paths to becoming a scientist and women in STEM issues. ***Summer 2020 and 2021 cancelled. Summer 2022, in-person.*

Teaching Assistant, “Genome Editing of Marine Organisms”

University of California, San Diego.

SIO 296: Genome Editing of Marine Organisms

Fall 2018; Fall 2021

Helped choose developmental and immunology themed topics and papers for discussion; lead themed discussion among 9 MSc/PhD students; helped develop and run hands-on CRISPR-based gene editing learning modules with the sea urchin embryo.

Guest lecturer, “Ecological Developmental Biology”

University of California, San Diego.

SIO 189: Pollution, Environment, and Health.

Nov 2019 to present

Prepare and present one 90-min lecture on environmental inputs on development and embryonic defense mechanisms; Create short-answer and multiple-choice exam questions.

Invited guest lecturer, “Cell to Cell Signaling” (Virtual)

San Francisco State University.

BIO 380: Evo-Devo

Feb 2021

Prepared and presented one 90-min lecture on cell signaling pathways and environmental inputs on development; Created 5 short-answer exam questions.

Graduate and Undergraduate Experience:

2012-2017 Mentor, Undergrad students (2). Sunnybrook Research Institute, Toronto, ON

- 2016 to 2017: Mentored undergraduate Hannah Fung, in her senior thesis project (cloning transgene reporters for gene regulation in development; microinjection of zygotes; fluorescent microscopy techniques) and **graduate school applications**. Hannah started **PhD studies at Stanford** University in Sept 2018.
- 2012: Supervised undergraduate summer student, Koeun Bae, in basic molecular biology techniques, microinjection of zygotes, microscopy, and poster presentation. Koeun **received manuscript authorship** (Ho et al *ICB* 2016) and has since **completed the MSc program** in Cell and Systems Biology, University of Toronto.

2014-2015 Mentor, High school students (2). The Dragon Academy, Toronto ON

- Jan 2015: Ran a sea urchin-based **interactive high school lab activity** (90 min) on fertilization and early development, hosted at The Dragon Academy Secondary School.
- Sept 2014 to May 2015: Mentored two male Grade 10 and 12 students in basic molecular biology skills for **high school science fair** projects.

2013-2016 Teaching Assistant, Fundamental and Developmental Immunology.

Department of Immunology, University of Toronto

- Ran Mock Debate group activity 2x a semester.
- Graded midterm and final exams (>30 students).

2011-2013 Volunteer, SciChat Outreach. University of Toronto

- Developed and presented community center and public library education programs that feature immunology and basic science research-related topics for the general public
- Co-hosted a “Labs on Tap” event in 2016 and presented basic and immunology research for a non-science audience

2010-2016 Volunteer, Let’s Talk Science Foundation. Toronto, ON

- World Immunology Day (April 2012-2016): Presented an overview of the immune system for Grade 10-12 science classes at Toronto area high schools.
- Stem Cell Talks Toronto (May 2013): Group discussion leader for Grade 11/12 students in a symposium on the biology and ethics of hematopoietic stem cells and public bone marrow transplantation/umbilical cord blood bank networks.
- Science Rendezvous Festival (May 2012): Organized hands-on activities with microscopes and macrophages at the Department of Immunology (U of T) booth.
- Afternoon Science Club, Jarvis Collegiate Institute (Sept 2011): Implemented a hands-on, sea urchin based lab activity on fertilization and early development.

2009-2010 Teaching Assistant, *Introduction to Biology (Lab)*. GWU, Washington, D.C

- Developed and presented weekly lab lectures for 25 undergraduates.
- Designed and graded homework, lab assignments, and test materials.

2009 Undergraduate Lab Assistant, *Microbiology*. GWU, Washington, D.C

- Maintained 2x weekly lab sections and supplies for 20 undergraduates.

2006 Summer Camp Counselor, *Stephen Birch Aquarium*. SIO, La Jolla, CA

- Supervised aquarium and beach visits for 20+ grade school students.
- Developed art and science activities to augment Aquarium Education.

ACADEMIC SERVICE and LEADERSHIP EXPERIENCE

Dec 2021 to present Echinoclub Co-Organizer

- Organizing and administrating monthly virtual meetings of the Echinoderm Research Community, <https://www.echinobase.org/entry/doNewsRead.do?id=675>.
- Establishing new communication venues to support trainee learning and troubleshooting
- Improving Post Doc and Junior Faculty career development and resource sharing within the community
- Create and promote social media content and monitor Slack Channel for trainee discussion.

March 2020-present Symposium Co-organizer.

Animal immunity at the interface of development and the microbial environment

- 8th European Society for Evolutionary Developmental Biology. July 2020. Naples, Italy.
**Rescheduled for May-June 2022. <https://www.evodevo2020.eu>
- Sponsored by The Company of Biologists Scientific Meeting Grant, £2000.
- Invited four senior guest speakers (2 female, 2 male).
- Chairing our symposium session and Q+A.

Jan 2018 to present Reviewer: *Frontiers in Zoology, Scientific Reports, iScience*

April 2018 Judge: UCSD Biotechathon Case Competition

2014- 2016 Co-Editor-in-Chief and Design Director: *IMMpress Magazine*

Department of Immunology, University of Toronto.

<http://www.immpressmagazine.com/>

- Student-led magazine that promotes the open discussion of immunology, science, and academia. ISSN 2291-2401 (Online); 2291-2398 (Print, Quarterly).

- Acquired outside sponsorship and co-managed a \$15,000 annual budget.
- Directed the editorial themes and designed layouts for each 32-page issue; managed web content.
- Advocated for content covering basic and comparative sciences and evolutionary topics in immunology.
- Contributing author and designer since 03/2013:
<http://www.immpressmagazine.com/author/cschrinkel/>

2015-2016 Selection Committee Member, SRI Summer Scholarship.

Sunnybrook Research Institute, Toronto ON.

- Panel member to discuss, rank, and award undergraduate scholarships for the SRI Summer Student Research Program

2011-2012 Representative, Immunology Graduate Student Association.

Department of Immunology, University of Toronto

- Organized weekly lunches between Easton seminar speakers and departmental graduate students.
- Planned monthly social and cultural activities for interdepartmental graduate students.

ADDITIONAL RESEARCH EXPERIENCE

July 2019 ASSEMBLE Visiting Scholar

Characterized ABC transporter localization and activity in developing tunicates. McDougall and Dumollard Labs, Institute de la Mer Villefranche. Villefranche, France.

Oct 2015 Gene Regulatory Networks for Development

Marine Biological Laboratory, Woods Hole, MA.

10-day workshop on gene regulatory networks (GRNs) in embryonic and post-embryonic developmental systems across several model systems.

July 2012 Visiting Graduate Student, Mount Desert Island Biological Laboratory.

Rast Lab summer sabbatical to study environmental impacts on sea urchin larval immunity. Mount Desert Island, Maine.

UNDERGRADUATE RESEARCH EXPERIENCE

2008-2009 Thesis Student, Undergraduate Honors Program. GWU, Washington, D.C

2008 Undergraduate Research Summer Scholar. GWU, Washington, D.C

- Developed a bacterial binding assays and performed immunoblotting to elucidate immune functions of the innate immune response Sp185/555 protein family in the purple sea urchin.
- Youngest student presenter at the 11th Congress of the International Society for Developmental and Comparative Immunology (ISDCI) in Prague, CR.
- Acquired \$1250 in travel awards for ISDCI attendance.
- Mentored a local female Grade 12 student in basic sea urchin care and molecular biology.

2007-2008 S.E.A. Semester, Oceans and Climate study abroad program

Sept to Oct 2007: Sea Education Activity, Woods Hole, MA

Nov 2007 to Jan 2008: *S.S.V. Robert C. Seamans*, Pacific Ocean.

- Used oceanographic field methods to study the distribution of phytoplankton in relation to pH and depth along a 3,000-mi cruise track from Puerto Vallarta, Mexico to Papetee, Tahiti
- Active crewmember and scientist aboard a brigantine research vessel.

REFERENCES

1. Dr. Amro Hamdoun, PhD

Post-Doctoral Advisor

Professor

Scripps Institution of Oceanography

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Hubbs Hall 3255

La Jolla, CA 92037

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ahamdoun@ucsd.edu

4. Dr. Jeffrey Chang, M.D.

ROSA Program Collaborator and Mentor

Professor Emeritus

Reproductive Endocrinology & Infertility

Department of OB/GYN & Reproductive Sciences

UCSD School of Medicine

9500 Gilman Drive, #0633

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2. Dr. Jonathan Rast, PhD

PhD Advisor

Senior Scientist

Emory University School of Medicine

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5. Dr. Victor Vacquier, PhD

Post-Doctoral Mentor

Distinguished Emeritus Professor

Scripps Institution of Oceanography

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3. Dr. L. Courtney Smith, PhD

Masters/Undergraduate Advisor

Professor of Biology

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6. Dr. Dede Lyons, PhD

Collaborator; Post-Doctoral Mentor

Assistant Professor

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