

# tidepool



**October 2022**

Editor-in-Chief:  
Eric Ignatz

Associate Editor:  
Dr. Matthew Rise

Photography:  
Valesca De Groot



Valesca De Groot

## Thanks for Reading!

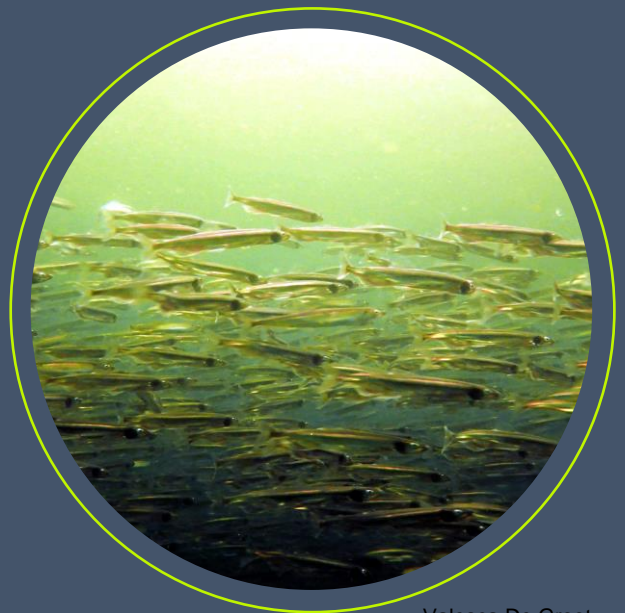
Thank you for reading the second edition of *tidepool*! With the continued support from members within the department, the current newsletter contains all sorts of exciting updates from our community.

As always, our goal is to increase transparency, communication and help to build a stronger sense of community at the Ocean Sciences Centre (OSC).

If there are any recommendations for future issues of *tidepool* or you would like to become involved on the editorial team, please email Eric at [ehignatz@mun.ca](mailto:ehignatz@mun.ca)!

## Table of Contents

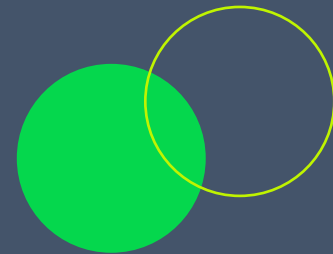
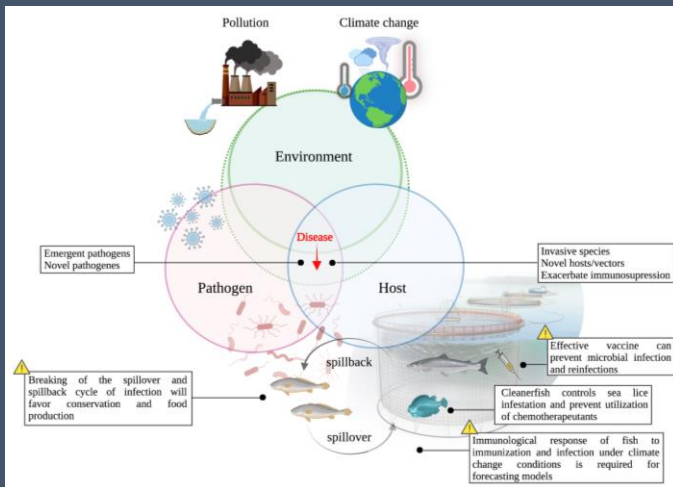
Faculty Spotlight – Dr. Javier Santander	3
A Word from the Department Head	5
AAC Research Award of Excellence	6
OceanUS Announcements	8
OSGSA News	9
Welcome to New Arrivals	10
Occupational Health & Safety Report	11
Public Outreach	11
Accomplishments within the Department	12



Valesca De Groot

## Faculty Spotlight: Dr. Javier Santander Marine Microbial and Pathogenesis Laboratory

Diseases are natural components of ecological systems, acting as a driver of population dynamics with the capacity to reshape ecosystems, altering services, biomass production, succession, and overall stability. Disease outcomes are dynamic and environmental changes can affect both the host and the pathogen (Fig. 1). Under this context, my research program focuses on host-bacterial pathogen interaction, fish and cellular immunity, marine bacterial physiology, and, more recently, cleaner fish genomics. The long-term goals of my research program are to *i)* understand the molecular mechanism(s) of pathogenesis in marine organisms and give an insight into microbial pathogenesis evolution driven by climate change; *ii)* understand how different microbial pathogens hijack the fish innate and adaptive immune systems, *iii)* understand how to induce a protective memory immune response against microbial infectious diseases in fish; and *iv)* accelerate the genetic selection of finfish families resistant to infectious diseases.

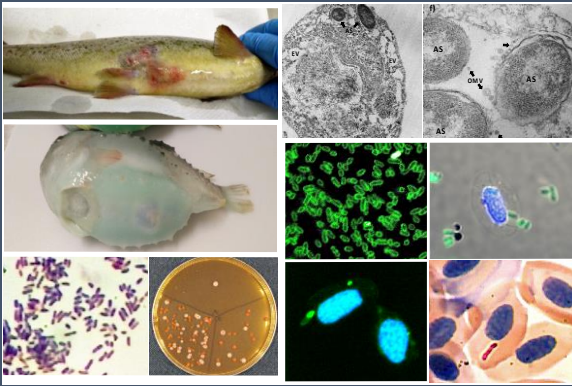


**Figure 1.** Climate change impacts on marine host-pathogen-environment triad of ecological factors to consider in disease management in cold-ocean environments and aquaculture, and under study in Santander lab.

Using microbiological, cellular, genetic, and omics techniques, we study mechanisms of pathogenesis and fish immunity<sup>1,2</sup>. The molecular mechanisms of bacterial fish pathogens are poorly understood, precluding the development of effective vaccines<sup>3-5</sup>. Although virulence factors of bacterial pathogens are diverse, the regulatory mechanisms of these virulence factors seem conserved. Studying these regulatory mechanisms might allow the development of vaccine platforms for different purposes, such as delivering heterologous antigens or DNA vaccines directly to the lymphoid tissue without a needle. Also, the study of virulence factors allows for the design of injectable prototype vaccines using reverse vaccinology and immunoinformatics<sup>6</sup>. In collaboration with the aquaculture, government, and pharma industry, our most successful vaccine is under field testing, which is a milestone for our lab<sup>7</sup>. Recently, we began to explore the genome sequencing of cleaner fish species, including lumpfish and cunners, and study their pathogens<sup>8</sup>. In partnership with multiple collaborators, we recently launched a successful pioneer program to select lumpfish resistant to bacterial infectious diseases, which has been expanded to other fish species. In addition, we collaborate with national and international institutions on biofilms, microbial-induced corrosion, oil bioremediation in marine environments, fish nutrition, and biomedicine. Overall, this research has generated fundamental knowledge about the evolutionary mechanisms of bacterial pathogens, host-response, and fish health applied to aquaculture<sup>9-15</sup>.







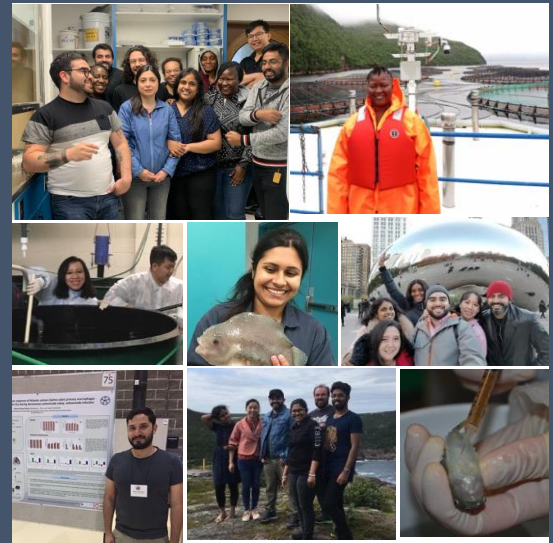
Representative figure of techniques/results used/observed in the Santander lab.

Our research group is diverse in gender, age, visible minorities and ethnicity. We have students/colleagues from 6+ different countries, with a great interest in marine sciences, which creates and maintains an inclusive, creative, academic intensive, and welcoming environment. Finally, recently, I was awarded the 2022 Distinguished Emerging Scholar Award by the Faculty of Sciences at Memorial University, and I would like to take the opportunity to thank the current and past members of our lab that contributed to this honour.; many thanks to all and to the “omnipresent microbes”.

-Dr. Javier Santander

References (\*corresponding author; underline, past and present Santander's lab members; <https://scholar.google.com/citations?user=-tY9JQMAAAAJ&hl=en>)

- Gnanagobal, H., T. Cao, A. Hossain, M. Dang, J.R. Hall, S. Kumar, D.V. Cuong, D. Boyce, J. Santander\*. 2021. Lumpfish (*Cyclopterus lumpus*) is susceptible to *Renibacterium salmoninarum* infection and induces cell-mediated immunity in the chronic stage. *Frontiers in Immunology* 12:733266.
- Gnanagobal, H., and J. Santander\*. 2022. Host-pathogen interactions of marine Gram-positive Bacteria. *Biology* 11(9):1316
- Chakraborty S., T. Cao, H. Gnanagobal, I. Vasquez, D. Boyce, J. Santander\*. 2019. Vibrogen-2 Vaccine Trial in Lumpfish (*Cyclopterus lumpus*) Against *Vibrio anguillarum*. *J. Fish Dis* 0:1-8
- Dang, M., T. Cao, A. Hossain, I. Vasquez, H. Gnanagobal, S. Kumar, J. Hall, J. Monk, D. Boyce, J. Westcott, J. Santander\*. 2021. Oral immunization of larvae and juvenile of lumpfish (*Cyclopterus lumpus*) against *Vibrio anguillarum* does not influence systemic immunity. *MDPI Vaccines* 9(8):819.
- Vasquez, I., T. Cao, A. Hossain, K. Valderrama, H. Gnanagobal, M. Dang, R. Leeuwis, M. Ness, B. Campbell, R.L. Gendron, K. Kao, J. Westcott, K. Gamperl, J. Santander\*. 2020a. *Aeromonas salmonicida* Infection Kinetics and Protective Immune Response to Vaccination in Sablefish (*Anoplopoma fimbria*). *Fish and Shellfish Immunol* 104:557-566.
- Chukwu-Osazuwa, J., T. Cao, I. Vasquez, H. Gnanagobal, A. Hossain, V. I. Machimbirike, J. Santander\*. 2022. Comparative reverse vaccinology of *Piscirickettsia salmonis*, *Aeromonas salmonicida*, *Yersinia ruckeri*, *Vibrio anguillarum* and *Moritella viscosa*, frequent pathogens of Atlantic salmon and lumpfish aquaculture. *Vaccines* 10(3):43
- Onireti, T., T. Cao, H. Gnanagobal, J. Chukwu, I. Vasquez, A. Hossain, V. I. Machimbirike, J. Monk, A. Houry, N. O'Brian, A. Swanson, D. Boyce, J. Santander\*. 2022. Evaluation of the protective efficacy of an autogenous vaccine in lumpfish (*Cyclopterus lumpus*) against *V. anguillarum* under controlled and field conditions. *Science Atlantic Aquaculture and Fisheries and Biology Conference, PEI, Canada. Oral presentation; Remote presentation. 1st Best Communication Award\**
- Navaneethaiver, U., K. Valderrama, I. Vasquez, C. Segovia, A. Hossain, T. Cao, H. Gnanagobal, J. Monk, D. Boyce, and J. Santander\*. 2021. A Novel Marine Pathogen Isolated from Wild Cunners (*Tautoglabrus adspersus*): Comparative Genomics and Transcriptome Profiling of *Pseudomonas* sp. Strain J380. *MDPI Microorganisms* 9(4):812.
- Soto-Dávila, M., A. Hossain, M.L. Rise and J. Santander\*. 2019. *Aeromonas salmonicida* subsp. *salmonicida* Early Infection in Atlantic Cod (*Gadus morhua*) Primary Macrophages. *Frontiers in Immunology* 10:1237
- Valderrama, K., M. Soto-Dávila, C. Segovia, I. Vasquez, M. Dang, J. Santander\*. 2019. *Aeromonas salmonicida* Infects Atlantic salmon (*Salmo salar*) Erythrocytes. *J. Fish. Dis.* 00:1-8
- Vasquez, I., Cao T., Chakraborty S., Gnanagobal H., O'Brien, N., Mock, J., Boyce, D., Westcott J. D., J. Santander\*. 2020b. Comparative Genomics of *Vibrio anguillarum* Isolated from Lumpfish (*Cyclopterus lumpus*) in Newfoundland Revealed Novel Chromosomal Organizations. *Microorganisms* 8(11):1666.
- Soto-Dávila, M., S. Chakraborty, J. Santander\*. 2022. Relative expression and validation of *Aeromonas salmonicida* subsp. *salmonicida* reference genes during *in vitro* and *in vivo* infection. *Infection, Genetics and Evolution.* 103:105320
- Chakraborty, S., T. Woldemariam-Nardos, V. Tina, M.L. Rise, D. Boyce, J. Santander\*, R. Andreassen\*. 2022. Characterization of miRNAs in embryonic, larval, and adult lumpfish adult provides a reference miRNAome for *Cyclopterus lumpus*. *Biology* 11:130
- Gendron, R.L.\*, H. Paradis, T. Hyde, T. Cao, V. I. Machimbirike, C. Segovia, I. Vasquez, M. Ghasemishk, G. Scapigliati, D. Boyce, J. Santander. 2022. CD45 in ocular tissues during larval and juvenile stages and early stages of *V. anguillarum* infection in young lumpfish (*Cyclopterus lumpus*). *Fish and Shellfish Immunology* 128:523-535.
- Vasquez, I., A. Hossain, K. Valderrama, H. Gnanagobal, M. Ness, B. Campbell, S. Charrete, K.A. Gamperl, R. Cipriano, C. Segovia, J. Santander\* 2022. Comparative Genomics of Typical and Atypical *Aeromonas salmonicida* subsp. *salmonicida* reveals new insights in bacterial evolution and pathogenesis. *Microorganisms* 10:189



Representative figure of past and present members of the Santander lab

## A Word from the Department Head

Firstly, I would like to thank Dr. Ian Fleming for his excellent recent service as Head of our Department. Also, many thanks to everyone involved in making the newly renovated Head's Office such a beautiful working space. With that view, there is no need for art on the walls!

Secondly, even though they are mentioned elsewhere in this issue of *tidepool*, I'd like to congratulate two members of our community who have won prestigious national awards over the past three months:

- Dr. Uta Passow is the 2022 recipient of the A.G. Huntsman Award for Excellence in the Marine Sciences. This distinguished award was presented by the Royal Society of Canada to Dr. Passow for "significant contributions to our understanding of the ocean and its ability to respond to anthropogenic changes such as climate change and oil pollution" (web reference: <https://www.huntsmanaward.org/>).
- At the Aquaculture Canada and World Aquaculture Society North America 2022 conference in St. John's in August, Danny Boyce and the JBARB Team received the Aquaculture Association of Canada (AAC) Research Award of Excellence for their world-class work on the cleaner fish (e.g., lumpfish) that are key parts of integrated pest management programs at salmon farms. Please read Danny's article in this issue of *tidepool*. I will not steal any more of his thunder.

Finally, I extend congratulations to members of our community who were honoured at the Faculty of Science Awards Ceremony on September 21, 2022. Our Department had a lot to be proud of at this awards ceremony, including student, staff and faculty awards! Danielle Nichols received the Dean of Science Distinguished Service Award; please see the "Public Outreach" article in this issue of *tidepool* for some details on the important public education work that Danielle leads. Dr. Javier Santander won a Distinguished Emerging Scholar Award; please see this issue's "Faculty Spotlight" article for information on the exciting, timely and state-of-the-art research occurring in Dr. Santander's lab. In addition, two students in our Department (Sydney Sullivan and Darren Li Chong Youne Li Shing Hiung) won the coveted Lou Visentin Award for being named to the Dean's List in all four years of their program. There are several other important awards and milestones listed in this issue of *tidepool*. Well done all!

-Dr. Matt Rise

## AAC Research Award of Excellence Every Challenge is an Opportunity

### Change the Way You Think About Problems & Come Out on Top!

Congratulations to Danny Boyce and the entire JBARB Team at Memorial University, Department of Ocean Sciences and Cooke Aquaculture for winning the Aquaculture Association of Canada (AAC)'s Research Award of Excellence for their work on advancing cleaner fish technologies regionally and internationally!

The award was recently presented during the Aquaculture Association of Canada (AAC), World Aquaculture Society (WAS) and Newfoundland Aquaculture Industry Association (NAIA) North America Conference in St. John's, NL Canada. This conference hosted 1186 participants, from 46 countries and was by far the largest and best aquaculture event ever held in Canada.

**The AAC Research Award of Excellence recognizes high quality, innovative and current research that has a “significant impact on the aquaculture industry in Canada”.**



Dr. Andrew Swanson (Cooke Aquaculture - VP Research and Development), Mr. Danny Boyce (MUN) receiving awards from Ms. Kim Gill (AAC President).

It's the 2<sup>nd</sup> time since inception of this prestigious award starting in 2000, that the award has been received in Newfoundland and Labrador. The last time was by the late Dr. Joe Brown in 2001 at Memorial University.

I am truly honored to receive it along with my co-workers at Memorial University, research scientists and support staff – at the Department of Ocean Sciences, Marine Institute and industrial partner Cooke Aquaculture.

It is an even greater honor to be placed in such distinguished ranks as those of the past honorees, most of whom have been colleagues at one time or another, all of whom have made important contributions to the Aquaculture Industry in Canada.

It is also extra special to receive this award, from a personal perspective in recognition of the late Dr. Joe Brown, whom received this award in 2001 and passed away in 2005, after 20 years at the Marine Lab.

I've tried my best to carry on Joe's aquaculture legacy with managing the day to day operations of the Dr. Joe Brown Aquatic Research Building (JBARB) in aid of our programs, supporting students, industrial research and so forth.

Having a personal relationship with industry members, taking the time to support students and having fun. Trying to minimize barriers that exist between industry and academia. Understanding what the industry needs are and ensuring we can help.

Memorial is truly a supporter of the Ocean sector, with a focus on “Aquaculture”.

I saw the Sea Lice Challenge as an “Opportunity” for R&D at Memorial.

This research has allowed us to further expand and increase our knowledge and production of an important tool for industrial use in their “Integrated Pest Management Program (IPMP)” within our salmon farms. Cleaner fish which is an **“Innovative and New Green Technology”** continues to be an important tool for use on farm sites in the region.



The Cleaner Fish file(s) at Memorial are excellent examples of where personnel from “Industry” collaborate with the “MUN Research Team” and this has created some very positive outcomes.

It provides immediate insight into discoveries and helps to build long-term, trusting relationships between Memorial’s Research Team, Industry Partners and Funders.

This file over the past number years has received support from a variety of sources - Province of NL, Atlantic Canada Opportunities Agency (ACOA), Department of Fisheries and Oceans (DFO) – Atlantic Fisheries Fund (AFF), Canadian Centre for Fisheries Innovation (CCFI), Genome Canada /Genome Atlantic, Ocean Frontier Institute (OFI), MUN, NAIA and Industry players such as all salmon farming companies (Cooke Aquaculture, Grieg Seafood Newfoundland and Mowi Canada East) and soon to be producer Marbase Cleanerfish Ltd. have all supported this file.

A special thanks to Mr. Richard Pricket whom is a true friend and mentor - and to me is the best marine finfish hatchery consultant globally.

A sincere thanks to all my friends and colleagues who supported and helped me along the way in the United States, Iceland, Faroe Islands, United Kingdom, Norway and Ireland. Finally, the support of my family- Renee, Cameron and Rachel.

Outcome - We are now North America’s Leading Cleaner Fish R&D Facility and have Industry Led Sea Cage Demonstration Site(s).

- ▶ Broodstock Development - Global Leader
- ▶ Hatchery Production Technology
- ▶ Juvenile Supply for NL and Region
- ▶ Nursery Support (grading, vaccination etc.)
- ▶ Fish Health and Vaccine Development
- ▶ Population Genomics
- ▶ Transport Technology (land and sea)
- ▶ Farm Related Implementation Strategies (fish welfare, hides, feeding, distribution, timing)
- ▶ Training Support
- ▶ International Network & Rural Sustainability



Jill Porter, Danny Boyce, Taylor Sheppard. Cooke Aquaculture - Dr. Andrew Swanson and Sheldon George (NAIA President and Cooke -Salt Water Production Manager NL)

## In closing-

“In facing a challenge, history has shown research to be a catalyst for solving the world’s most pressing issues”.

Danny Boyce  
Facility and Business Manager  
Dr. Joe Brown Aquatic Research Building



# OceanUS Announcements

OceanUS (Ocean Sciences Undergraduate Society) is a student-run group that provides Ocean Sciences students with social events, networking opportunities, community engagement/volunteer opportunities, advice and more!

OceanUS has had a busy first month of the semester! We first had a Welcome Bonfire at Middle Cove Beach, where there were plenty of smores had and new friendships made. Last weekend, we joined up with BIOS to host a beach cleanup at Topsail Beach! It was great to have Biology and Ocean Sciences students connect over helping our community and the environment. We'd love to have you at our next event!

To keep up with OceanUS updates feel free to follow us on social media! OceanUS can be found on Facebook (OCEANUS – Ocean Sciences Undergraduate Society), Instagram (@mun\_oceanus) and email (oceanus@mun.ca).

- OceanUS 2022-2023 Executive Team

### 2022-2023 Executive Team:

President: Jill Carter

Vice President: Alessia King

Secretary: Theresa Allingham

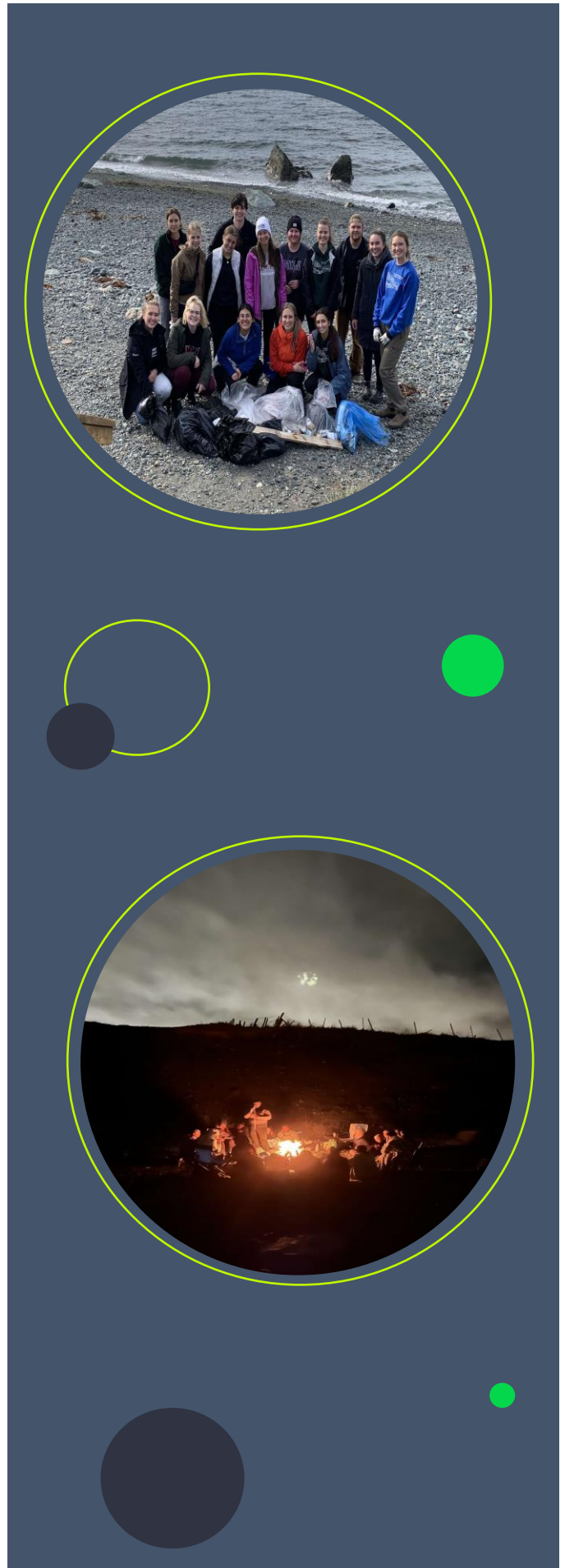
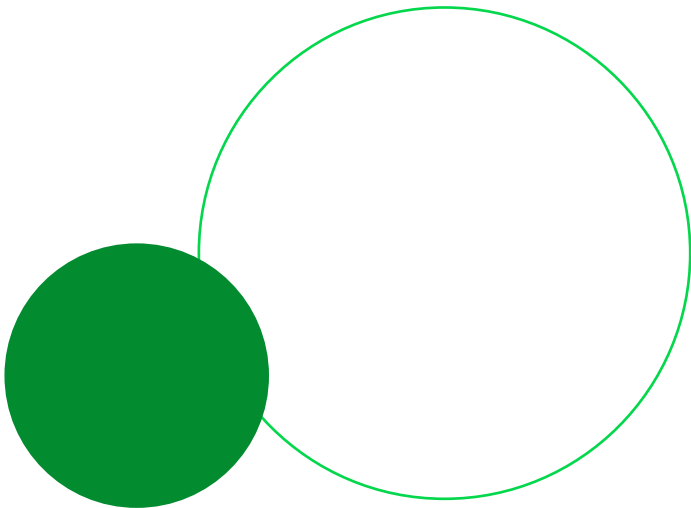
Treasurer: Jacob Mercer

Social Rep: Mary Londero

4th Year Rep: Isaiah Power Smith

3rd Year Rep: Jenna Keveryga

2nd Year Rep: Marcella Whelan





## OSGSA News

The Ocean Sciences Graduate Student Association (OSGSA) is an organization that aims to improve graduate student life at the OSC by providing both academic and social support!

The semester is already off to a busy start as the OSGSA organized a welcome BBQ back in early September and co-hosted a student bar crawl event with the BGSA and MIGS the following day. Our seminar series is in full swing as well with twelve presenters scheduled for this semester! We also will be hosting a potluck and board game night at the OSC on October 6 for graduate students to attend!

On September 27<sup>th</sup>, we held our fall general meeting and filled our executive committee for the 2022/2023 year. Grace Walls was elected as the Social Events Coordinator and Rahana Ebrahim was elected as our Communications Coordinator.

Be sure to follow us on social media to keep up to date on our future events!

-OSGSA 2022/2023 Executive Team

### **2022/2023 Executive Team:**

Chairperson: Eric Ignatz

Treasurer: Verena Kalter

Seminar Series Coordinators: Natalie Perrin, Coral San Roman, Joanna Dicks

Graduate Development Coordinator: Eleanor Barry

Graduate Studies Representative: Colleen McBride

Sustainability Coordinator: Olivia Dillon

Graduate Student Food Coordinator: Sara Jobson


Graduate Student Union Representative: Mary Clinton

Social Events Coordinator – Grace Walls

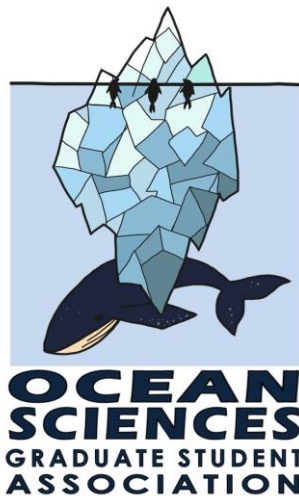
Communications Coordinator – Rahana Ebrahim

 MUN Ocean Sciences Graduate Student Association

 @munosgsa

 @munosgsa

 osgsa@mun.ca



## Welcome to New Arrivals



### Rahana Ebrahim

My name is Rahana and I'm from Toronto, Ontario. I completed my undergraduate degree in biology at the University of Ottawa. Here at the MUN OSC, I am in Dr. Iain McGaw's lab and plan to study the cardiovascular system of lobsters (Decapoda). Feel free to stop me in the halls to say hi!



### Mitchell Mehaney

My name is Mitchell and I'm from Summerford, Newfoundland. I completed my undergraduate degree in Marine Biology and Ocean Science here at Memorial. I'm just starting my Master's in Sustainable Aquaculture in Dr. Javier Santander's lab where my research will focus on the pathogenesis of *Piscirickettsia salmonis*.



### Stephan Hamisch

I am Stephan, a new grad student in Dr. Paul Snelgrove's lab. I studied Chemistry and Environmental Sciences at the University of Bayreuth, Germany. I completed my undergrad degrees on surface chemistry of aging microplastics and the impact of island development on epifauna in tropical seagrass ecosystems, respectively. My current research interests at OSC aim towards understanding the impact of rising ocean temperatures on biodiversity and nutrient exchange processes in benthic habitats.



### Victoria Heath

My name is Victoria, although I can go by Vicki, and I recently started my PhD with co-supervisors Dr. Sarah Lehnert from DFO and Dr. Ian Fleming in Marine Biology. I am from Windsor, Ontario where I completed my Masters degree at University of Windsor on Sea Lamprey and I am now working on understanding the effects of climate change on Atlantic salmon.



### Grace Walls

I'm Grace, originally from Cape Cod Massachusetts I was drawn off island to spend the last 8 years at sea, mostly working within the Baltic, Bering and North Atlantic on various research and fishing vessels. I completed my masters in Biological Oceanography at GEOMAR in Kiel, Germany and am currently a second-year doctoral candidate in the St. FX and Memorial University joint program, supervised by Dr. Iain McGaw and Dr. Russell Wyeth looking to unravel the mysteries of lobster foraging ecology using baited underwater videos.



### Dr. Kevin Ma

My name is Kevin and I recently joined the Mercier Lab. I received my PhD in Oceanography from Université Laval (Québec). For the past three years, I was a postdoctoral research fellow at Rhodes University (South Africa) working primarily with Christopher D. McQuaid on marine biogeography and species interactions on rocky shores. Here at Memorial University, my current research interests centre on the taxonomy and range extensions of deep-sea echinoderms, and on the population ecology and fisheries of sea cucumbers in Canada.

## Occupational Health and Safety Report

In addition to annual Laboratory and Workplace inspections conducted by Environmental Health and Safety staff, the OSC - OHS Workplace Committee conducts internal Workplace Inspections. These inspections are regular examinations of the workplace to recognize and evaluate existing and potential hazards and recommend corrective action. They are planned for later this Fall and an OSC Newsline will provide an update when they are scheduled.

The OSC – OHS Workplace Committee members include John Evelyn (employer representative co-chair), Dr. Iain McGaw, Greg Tremblett, Gord Nash (worker representative co-chair), Rebecca Sandrelli, Christine Vickers, Trevor Newman & Donna Inkpen. If you have any workplace safety concerns or are interested in participating on the committee, please contact one of the members.

-Gord Nash

## Public Outreach

### The Big Splash

The Big Splash event open house held at our partner site, the Champney's West Aquarium on Aug 6<sup>th</sup>, was a huge success welcoming 250+ visitors who participated in touch tanks, print making and beach walks.

### Outdoor Marine Public Education Program

We welcomed just over 21,000 visitors to the OSC's Outdoor Marine Public Education Program this summer (June 1st to Sept 5th) and an additional ~2400 people with our on-the-road traveling touch tank since June. We limited the traveling program this year and focused on more education events and groups that are not able to visit the OSC because of accessibility issues, such as the Vera Perlin Society, Easter Seals, etc. as well as support our partner organizations the Johnson GeoCentre, the Manuels River Interpretation Centre, and Parks Canada.

It was another busy but rewarding summer for the program staff and they did an amazing job!

-Danielle Nichols





## Accomplishments within the Department

### Awards

*Dean of Science Distinguished Emerging Scholar Award*  
**Dr. Javier Santander**

*Dean of Science Distinguished Service Award*  
**Danielle Nichols**

*AAC Research Award of Excellence*  
**Danny Boyce & the JBARB Team**

*A.G. Huntsman Medal*  
**Dr. Uta Passow**

*Best Poster – PEOPLE International Conference*  
**Verena Kalter**, PhD Marine Biology (Supervisor – Dr. Uta Passow)

*Philip H Jones Award – PEOPLE International Conference*  
**Emma Wells**, MSc Marine Biology (Supervisors – Dr. Uta Passow & Dr. Javier Santander)

*Ms. Carole Solberg and Dr. John Hoddinott Graduate Teaching Award*  
**Verena Kalter**, PhD Marine Biology (Supervisor – Dr. Uta Passow)

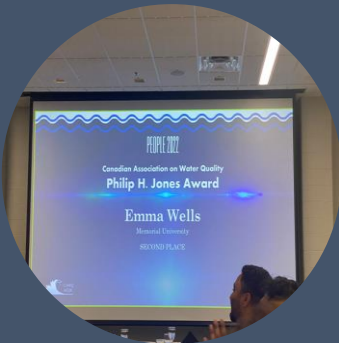
*Dean of Science Book Prize*  
**Rachel Stephan**, BSc Marine Biology

*Lou Visentin Award*  
**Darren Li Chong Youne Li Shing Hiung**, BSc Honours Ocean Sciences  
**Sydney Sullivan**, BSc Honours Marine Biology

### Theses Defended

**Rebecca Kwabiah**, BSc Honours Marine Biology, “Linkage between Eye Deformity, Major Histocompatibility Complex Class II, and LIM Homebox-2 encoding genes in Lumpfish (*Cyclopterus lumpus*)” (Supervisor – Dr. Javier Santander)

**Emilie Geissinger**, PhD Biology, “Overwinter Survival of Juvenile Atlantic Cod (*Gadus morhua*) in a Coastal Ecosystem” (Supervisors – Dr. Paul Snelgrove & Dr. Bob Gregory)



## ***Dean's List***

**Ajatshatru Balaji**, BSc Honours Ocean Sciences

**Devon Bath**, BSc Honours Ocean Sciences

**Alannah Chen**, BSc Marine Biology

**Jillian Carter**, BSc Honours Marine Biology

**Melanie Downer**, BSc Honours Ocean Sciences

**Nicholas Edwards**, BSc Ocean Sciences

**Jacob Mercer**, BSc Honours Ocean Sciences

**Isaiah Power Smith**, BSc Honours Marine Biology

**Rachael Stephan**, BSc Marine Biology

**Sydney Sullivan**, BSc Honours Marine Biology

## ***30 Years of Service***

**Dr. Margaret Shears**

## ***20 Years of Service***

**Dr. Kurt Gamperl**

**Dr. Jennifer Hall**

**Christine Vickers**

## ***Personal News***

Congratulations to **Zhiyu Chen**, Research Assistant with the CDRF, who recently welcomed a new addition to their family, Jesse Chen, a baby boy born on Canada Day!

\* If any updates / new arrivals / accomplishments were accidentally missed, please reach out to Eric ([ehignatz@mun.ca](mailto:ehignatz@mun.ca)) so that this information can be included in the next issue of *tidepool!* \*

