The Department of
Marine Biology

# Alumni newsletter

## Keeping in touch with the Marine Biology Department after you graduate

H. Nativ

July 2020

אוניברסיטת חיפה
University of Haifa
جامعة حيفا

LEON H. CHARNEY
SCHOOL OF MARINE SCIENCES
בית הספר למדעי הים על שם ליאון צ'רני

Dear students and alumni,

We had an exceptionally interesting and challenging academic year. We have started the year with a new faculty member, Dr. Tal Luzzatto Knaan, an expert in marine metabolomics, who studies microbial chemical communication in the sea. Our international MSc program was opened and currently our department has grown to about 60 MSc and PhD students from all over the world. Special greeting to our recently graduated students and to our three fresh PhDs: Dr. Maya Britstein, who has joined a start-up company (see below), Dr. Yotam Popovich, who has been very busy in disinfection and prevention of the Covid-19 pandemic in the last few month and Dr. Sophi Marmen, who continued to postdoctoral research. As in previous years, this past fall we had another wonderful academic get-together that included excellent talks and posters. It was a great joy for me to be part of such an event, providing a unique opportunity to get to know the new students and to learn more about each other in an informal setting. The 7th Haifa Conference on the Mediterranean Sea Research "Food from the Sea – Towards 2050 and beyond" took place in January, headed by Prof. Muki Shpigel, Prof. Ariel Diamant and Dr. Amir Neori, who have joined our Department as Research Fellows. Spring 2020 was a very unique semester, as we had to navigate through the challenges of the COVID-19 pandemic. This has been a challenge for everyone involved, students, faculty and staff. Following government and university guidelines, we moved all our classes online, and our students continue with their research analysis at home. We even had a departmental Passover beer toast on Zoom. Once it was permitted, our students returned to the labs, working in shifts. Currently, we have resumed our intensive courses at sea and in the labs and we will successfully complete the year's curriculum.

I would like to take this opportunity to thank you all for supporting each other. The faculty who had to transform their lectures to the online format, the Israeli and foreign students that continued to study under these challenging conditions, the lab managers and the essential students who took care of our labs and research, while we were at home, and our great staff that made all that possible, working unusual hours from home. This teamwork is very special and I highly appreciate that.

In the Newsletter, you will find some of the highlights and achievements from this extraordinary year of teaching, learning and research. As always, we very much want to hear about you, our Department's members and friends, past and present. Please keep in touch as you are part of our Marine Biology Department.

Wishing you a great summer,

**Dr. Tamar Lotan**

To our students and alumni,

This past semester has flown by in the shadow of the Corona pandemic that has hit globally and has affected us all in many ways, challenging us to change plans and acclimate to many new situations. As biologists we know that acclimation and adaptation are necessary evolutionary strategies allowing populations to adjust and survive in the face of environmental changes. Change also resulted in some hidden benefits that I think are well worth learning from. In this period of lockdowns and the regular school year shifting to mostly on-line classes and seminars we experienced new methodologies of teaching and learning. We held School seminars and events that could be reached by a much greater audience with invitees from around the world joining live on-line or recorded for later listening. Another benefit was the reduction of time wasted on hedging traffic and commuting – which could be focused on other activities such as research proposals, paper writing or even just getting to read more of the scientific literature.

Unfortunately, some things are still not possible and may be postponed or delayed for an unknown length of time. We could not hold a School-wide Ceremony to celebrate with our graduating students and to thank all those involved. Thus, I would like to take the opportunity to wish all graduating students – best of luck on your onward journey and hoping that the time spent a CSMS was a positive and productive experience. To our graduates around the world we hope you will join our efforts and spread-the word about your time here to potential new students that will come and enrich our multi-faceted team.

Enjoy the summer and I wish everyone much health and a rapid return to our daily rhythms and routines.

**Prof. Ilana Berman-Frank**


*The 7th Haifa Conference, Food from the Sea*

## Welcome Dr. Tal Luzzatto-Knaan

Metabolomics is the large-scale study of small molecules (AKA metabolites) and their interaction within a biological system. My main interest is understanding the functional role of natural products and their potential for biotechnological and medicinal applications. As a post-doctoral fellow at UC-San Diego, I specialized in cutting-edge mass spectrometry-based metabolomics, by developing tools for studying microbial chemistry and natural products discovery from marine cyanobacteria. Joining the department of Marine Biology at the Leon Charney School for Marine Sciences, my lab aims to pioneer the field of 'Functional Metabolomics' by exploring the biological role, regulation, diversity and distribution of natural products in polymicrobial environments and marine plants. These highly prolific environments are a treasure trove for novel chemistry and potential drug discovery.

## Proteorhodopsin bacteria: Non-photosynthetic marine bacteria that also capture and utilize light energy, indirectly affecting ocean $CO_2$ fluxes

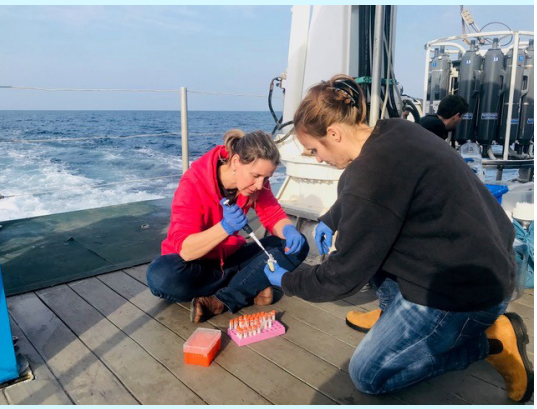
Dr. Laura Steindler

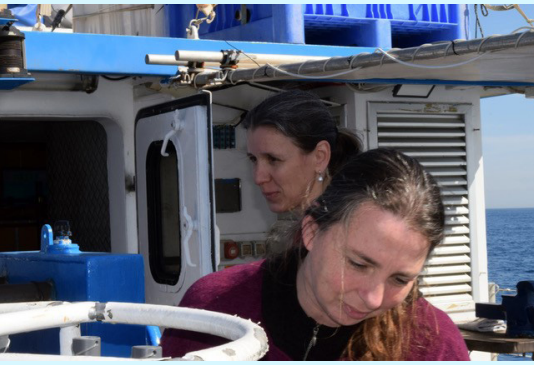
Since January 2020, all members of my lab have been involved in a wide investigation about proteorhodopsin photoheterotrophy and its function in light energy capture in the Sea.

So, let me first explain what proteorhodopsin is:

Proteorhodopsins are proteins found on the membrane of bacteria that, when exposed to light, will pump protons (H+) out of the cell. This creates a higher concentration of protons outside the cell, which will flow back into the cell through another membrane protein that creates energy, in the form of adenosine triphosphate (ATP). This energy can then drive many cellular processes, such as the uptake of nutrients into the cell or motility.


Thus, similar to photosynthetic bacteria and algae, proteorhodopsin-containing bacteria can also trap sunlight, but rather than being able to use light energy to fix carbon dioxide ($CO_2$) into sugars, they use light energy to produce chemical energy (ATP) and still require external organic carbon for their growth. Therefore, marine bacteria with proteorhodopsins are not just



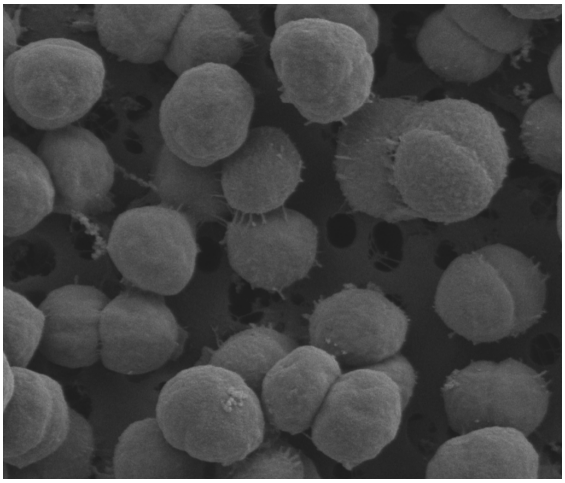


decomposers, as originally thought, but can actually function as producers of energy at ocean surface.

We study the function of proteorhodopsins in several diverse marine bacteria and find that often proteorhodopsins function as a back-up energy source. In other words, proteorhodopsins will not be very useful as long as the cells can obtain energy by “eating” (i.e., respiring organic carbon available in the Sea). However, once food (i.e. organic carbon) will no longer be available, cells with proteorhodopsin will have their back-up plan to survive during starvation by producing energy for survival through proteorhodopsin based “sun-tanning”. In a way, proteorhodopsin-harboring bacteria remind us of hybrid cars, powered by organic matter when available, and by sunlight, when nutrients become depleted.

To determine the ecological importance of proteorhodopsins, one needs to understand how common they are in the Seas. Several surveys showed proteorhodopsins can be very common in marine bacteria, with many more proteorhodopsin bacteria than photosynthetic bacteria in the Sea. In 2017 we showed that the incidence of proteorhodopsin in marine bacteria is highest in the Eastern Mediterranean Sea, making our location particularly interesting for the study of this phenomenon (this work was led by Dani Dubinski and Markus Haber, ex MSc and post-doc students in the lab). The Eastern Mediterranean Sea is characterized by particularly low nutrient concentrations and low primary productivity, suggesting that proteorhodopsin would be especially important for marine bacteria to survive such ‘desert’ conditions.

Thanks to a joint NSF-BSF grant received, I have partnered with Laura Gómez-Consarnau from University of Southern California, LA. The purpose of our ongoing study is to determine what regulates the presence and function of proteorhodopsins in contrasting nutrient regimes: the ultraoligotrophic Eastern Mediterranean Sea, and a dynamic upwelling region in the North Pacific coastal ocean.

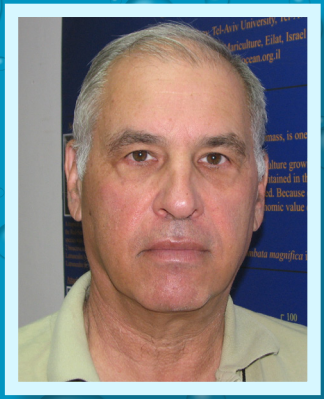


*Verrucomicrobia SEM image*

On our side, we started running monthly research cruises to an offshore location at circa 12 miles off the Israeli coast. We are now exactly half-way through our cruises (6 out of 12) and have found that proteorhodopsin function is important to energetically fuel substrate-transport functions in marine bacteria of our region. Additional information will derive from samples that we will be able to process in parallel, only at termination of the project (once we completed all 12 cruises). The student who is leading this project in my lab is Valeria Squatrito (PhD student), however all the lab (Rinat, Ilia, Chiara, Gustavo, Tzipi, Gobardhan, Xinyu and Reut) is recruited to assist and collaborate on this project, as it requires heavy-labor field and lab work. Moreover, Ayelet Dadon-Pilosof (Michmoret, Rupin), Tal Ben-Ezra, Mike Krom, Yoav Lehahn, and Misha Suchanov are collaborating with us and their input to the project is crucial to understand the chemo-physical conditions of the samples collected at different months of the year.

We hypothesize that summer months characterized by water column stratification and lower nutrient availability will show highest proteorhodopsin abundance and activity. If this holds true, we predict that in the future there will be a shift in the bacteria community, with warmer surface waters resulting in lower primary production and higher incidence of proteorhodopsin photoheterotrophy.

Results from our ongoing study aim to help inform element-based models that do not currently consider proteorhodopsin's potentially important solar energetic-capture contribution, and may thus provide inaccurate evaluations of the ocean carbon cycle. If substantially less organic carbon is required for heterotrophic bacterial growth in the ocean than is currently predicted based on photosynthetic-carbon assimilation only, this would be an important link in understanding the global carbon budget and potential responses to global climate change.



# Research projects at the Morris Kahn Marine Research Station, Department of Marine Biology

## Scientists: Profs Muki Shpigel, Ariel Diamant and Dr. Amir Neori Research assistants: Itai Kolski and Barak Azrieli

Muki Shpigel, Arik Diamant and Amir Neori are emeritus marine biologists who for over 30 years were senior researcher staff at the National Center of Mariculture (NCM) of the Israel Oceanographic and Limnological Research Institute (IOLR) in Eilat. Following their retirement (2017–2018), they joined the University of Haifa as Research Fellows and since 2018 have been involved with the advancement of the discipline of Marine Aquaculture at the Morris Kahn Marine Research Station.

## Reproduction and farming of the Mediterranean snail Hexaplex trunculus for the production of the Biblical light blue "Tchelet" dye

Funded by the Chief Scientist Office, Ministry of Agriculture & Rural Development.

*Hexaplex trunculus* (Muricidae) is a carnivorous gastropod, commonly found throughout the Mediterranean coasts and on the eastern coast of the Atlantic Ocean. The snail inhabits rocky and sandy environments, from shallow inshore coastal waters and down to a depth of 30m. Mature individuals may reach 80 mm in length. In shallow coastal waters, it usually favors calm areas protected from wave action and strong currents.

*The snail Hexaplex trunculus and the eggs capsule*

*H. trunculus* has double economic potential: like all representatives of the Muricidae family, its meat is considered a delicacy, which makes this marine snail an important part of the world shellfish fishery and in the Mediterranean basin in particular. In ancient times, this species was the main source for a dye industry that flourished among the early cultures of the Levant Basin and even permeated Jewish tradition. The dye was used to color expensive fabrics with a light blue tint ("Tchelet"). Today, there is a huge demand on the world market for natural dyes for textiles as well as a sectoral demand aimed at renewing the practice of dying prayer shawls ("Talitot") and various quality fabrics in Israel. The main compound in the *H. trunculus*-produced dye is 6-bromoindigotin (MBI), along with small quantities of 6,6'-dibromoindigotin (DBI) and indigotin.

In the Levant coast of Israel, where it was once abundant, *H. trunculus* is now rare and even considered endangered, for unknown reasons that have yet to be investigated. We think that the prospects for obtaining a steady supply of *H. trunculus* the purpose of dyeing fabrics (including prayer shawls) with a natural dye product while avoiding fishing pressure on its dwindling natural stocks on the Israeli coast, can only be achieved through environment-friendly farming in aquaculture.

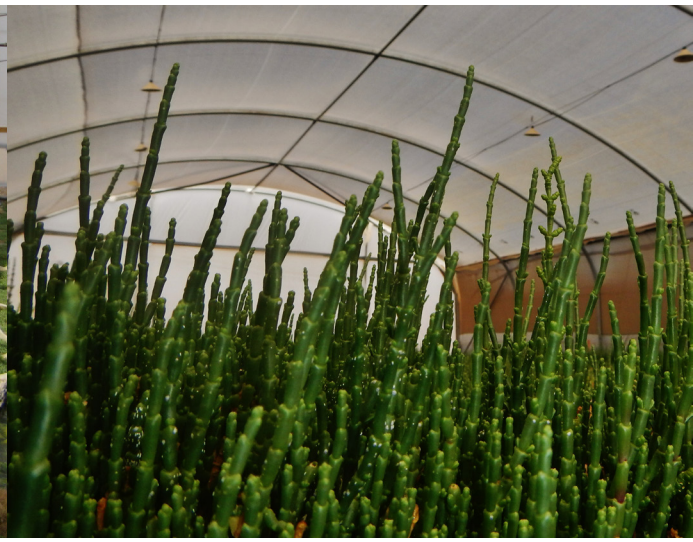
There are two major objectives in this project:

1. Developing a rearing protocol, including all of the snail's life stages, and identifying and overcoming any possible "bottlenecks" that may hold back its growth in captivity under farming conditions.
2. Developing a methodology that will enable extraction of *"Tchelet"* dye from the snail's ink gland in a non-destructive procedure, i.e., without having to sacrifice the animal, as is currently done.

Successful completion of the project will set the foundation for the establishment of a natural "Tchelet" dye industry with broad commercial potential, and help cease massive harvest of these snails from the sea, which is being currently done.

## SaltyCrops; Exploring perennial *Sarcocornia* as a halophyte biofilter for mariculture effluents and a source for profitable foods and biochemicals

Israel-Portugal collaboration; Funded by the Ministry of Science and Technology, Israel.



*Sarcocornia sp. as a commercial product and biofilter of fishponds effluents.*

Rising demand for seafood in Europe requires a sustainable expansion of aquaculture and calls for the tackling, both in Portugal and Israel, the delicate issue of aquaculture waste. Aquaponics combines conventional aquaculture

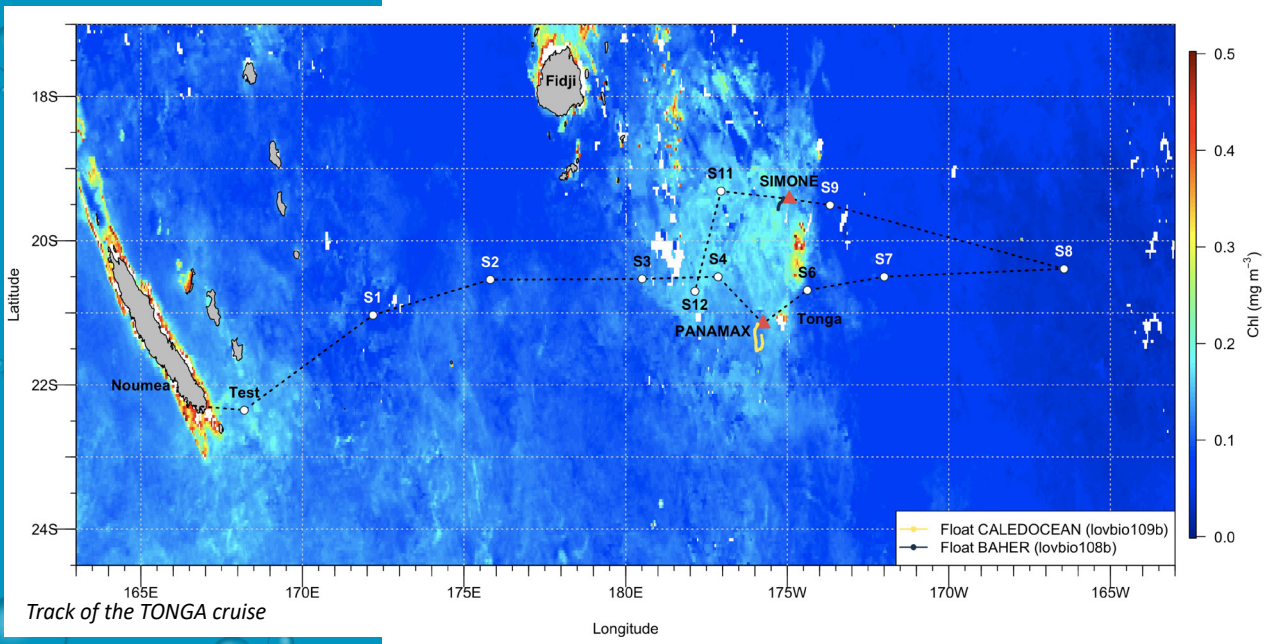
(raising aquatic animals) with hydroponics (cultivating rooted plants in water) in an interdependent environment. In aquaculture, excretions from the animals being raised can accumulate in the water, increasing toxicity. In an aquaponic system, water from an aquaculture system is fed to a hydroponic system where the animals' excretions are broken down by microorganisms into inorganic N, which is then utilized by the plants. The Integrated Multi-Trophic Aquaculture (IMTA) approach accomplishes environmental sustainability by growing aquatic plants with the cultured aquatic animals, such as fish and shrimp. The plants bio-mitigate the aquaculture wastes while providing additional ecosystem services and contributing to product diversification. The IMTA approach is highly recommended by FAO and other important bodies. Salt tolerant plants (halophytes) have been introduced in Israel in fish-halophyte IMTA systems, an innovation that has allowed using saline soils (considered non-arable and often available in coastal regions near pond fish farms) instead of costly ponds for the plant component. In Israel, the market value of the annual halophytes *Salicornia* spp. (a.k.a. marine asparagus, saltwort, glasswort, samphire) has made this approach economically attractive. Israeli farmers have recently tested related perennial shrubs- *Sarcocornia* spp. So far, however, these plants have shown inferior growth rates and an extended blooming period (a negative trait). In Portugal, this approach is still in its infancy. The objectives of Salty Crops are to 1) develop and optimize the production of faster-growing, shorter-blooming, and higher quality *Sarcocornia* varieties for fish- or shrimp-halophyte IMTA farms, and 2) identify and develop biochemical products from the inedible parts of *Sarcocornia.*


## The TONGA cruise

Prof. Ilana Berman-Frank

Waking up in the wee hours of the night to the sound of seawater gushing in through the porthole and standing in pajamas wringing out towels to dry the 15 cm of water splashing on the cabin floor, was not in my plans when I boarded the L'Atalante – a French research vessel headed from New Caledonia to the great South Pacific Gyre. Yet, thirty-seven days later (no docks in sight – only blue ocean and sky), after 7,000 km traversed, reaching depths of 5,700 m at deepest station, and working intensely around the clock, I realized this was an adventure I will cherish for a long-time.

The **TONGA** cruise (short for – Shallow hydro**T**hermal s**O**urces of trace eleme**N**ts: potential impacts on biological productivity and the biolo**G**ic**A**l carbon pump) set out to explore the impacts of hydrothermal sources on the




*Track of the TONGA cruise*

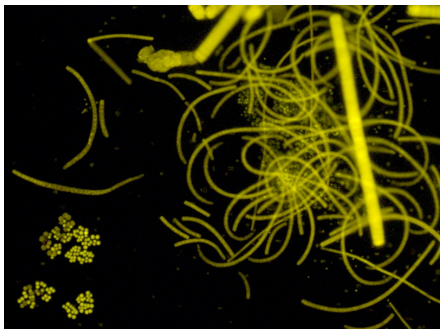
planktonic ecosystems of the South Pacific Ocean in areas of active volcanic activity both below the sea as well as above. The 70 people on board included 30 scientists working together investigating diverse perspectives from mapping the underwater volcanoes, their physical structures and chemistry of the plumes and hydrothermal emissions, to their impacts on the surface waters and the atmosphere above, and the biological populations.

For me, this was an opportunity to continue a long-term collaboration with my French colleagues in the South Pacific Ocean looking specifically for the effects of these processes on the amazingly versatile dinitrogen-fixing cyanobacteria that currently thrive in these areas. These ancient organisms, forming the basis of marine food-webs, have special metabolic pathways enabling them to use atmospheric nitrogen and consequently supply the oceans with biologically available nitrogen, a compound needed for all living organisms, yet with limited availability in many of the world's surface oceans.

*First land sighted after 25 days at sea – uninhabited islands off Tonga*

Standing on the bridge of the ship – watching the blooms of these organisms which have inhabited the Earth for over 2 billion years and were observed also 200 years ago by Captain Cook and Charles Darwin (termed "sea-sawdust")., and knowing that these blooms are so expansive they can be seen by satellites

above – is a humbling experience. Their great physiological and ecological flexibility and multitude of adaptations to the changing environment will probably enable them to keep on flourishing long after we humans are gone from this earth.



*diverse nitrogen fixing cyanobacteria that bloom on the surface ocean as yellow-red ribbons that can be seen by satellites*

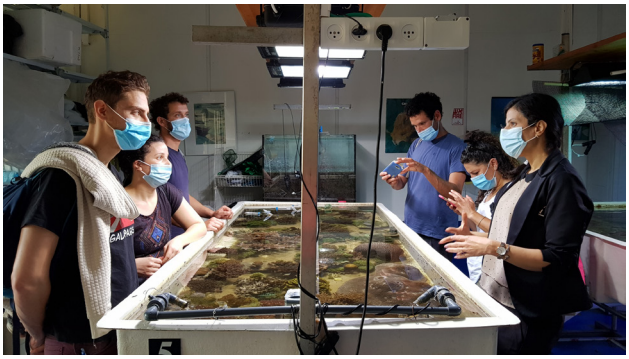
Studying these organisms for the past 20 years, I have come to understand that the more we know about them, the more questions remain… The hundreds of samples and thousands of measurements we now have in our freezers and computers from the TONGA cruise will, after the long analytical process hopefully bring us a few steps closer to understanding what makes them so successful on an evolutionary scale.

*Practicing for unexpected emergencies – wearing immersion suits*

## Sea, society, education and leadership

### Dr. Tzvia Gildor


One of the goals of the Charney School of Marine Sciences is to connect the general public to the sea and to marine sciences. Another goal is to provide the school alumni with the expertise and tools to plan and carry out projects, including educational ones. As a way to reach both goals, we initiated this year a course named “sea, society, education and leadership”, with the assistance of the University “flag program” and with funding from the national committee for higher education.



Students from our school learned about challenges in education (especially for children from a low socio-economic background) and obtained experience in project management, time and resource planning, and educational skills. The initial plan was to work with 7th grade kids from IRONI GIMEL school, study with them various aspects of human impact on the sea, and present our mutual work to their peers at school. BUT… then the COVID epidemic came and shuffled the cards. Since we could not meet the kids at school directly, we focused on finding online ways to introduce marine sciences. We built an internet site in Hebrew with lots of information on the sea and on marine sciences https://windowtothesea2020.wixsite.com/ocean), presented TED-like talks on a selected idea in marine sciences, and helped guide the school kids in their final scientific project for the year via ZOOM meetings. Maybe we won't fix the world, but at least we hope we did our small part to educate the next generation to think about the problems and solutions of responsibly harvesting the sea.


## Congratulation

Dr. Smadar Ben-Tabou de-Leon

for the publication of her first children book together with her daughter Yarden

Marine Biology
Get Together

*Marine biology Get Together logo designed by Irit Shaim*

# 6th Academic Get-Together

In January, the 6th academic meeting of the department took place at Caesarea Sea Center. It was attended by more than 80 PhD and MSc students, postdoctoral fellows, principal investigators, research fellows and scientists. Words in memory of Prof. Abraham (Avremala) Haim were said by Ziv Zemach Shamir. The meeting included excellent lectures by students from different research groups and two poster sessions, during which 45 interesting posters were presented by the students. This year, we had a logo competition and the winner was Irit Shaim, whose beautiful logo decorated the mugs for the meeting.

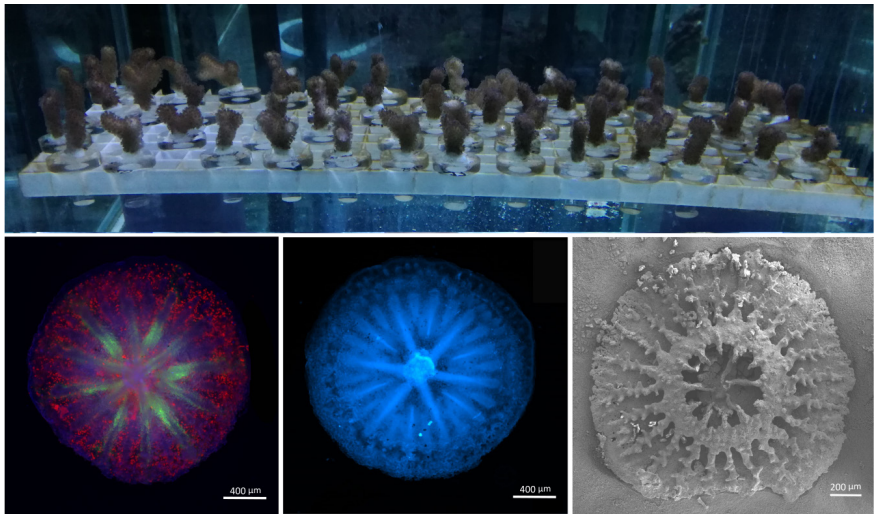
We are pleased to share with you a few words from the six students, who won awards at the meeting.

# Outstanding talk awards

## Federica Scucchia

I'm a PhD student at Dr. Tali Mass' lab and my research is focused on the response of juvenile and adult corals to decreasing oceanic pH. In particular, I'm employing a multidisciplinary approach by examining changes in skeletal morphology, calcification, respiration, photosynthesis and gene expression patterns in both the corals and their endosymbiotic algae, to better understand the response of these organisms to ocean acidification.

I'm also interested in examining the relative influence of plasticity versus adaptation on changes in morphology, physiology and gene expression that enable corals to thrive across broad vertical gradients, from shallow to mesophotic reef.

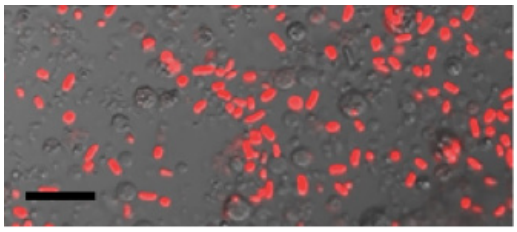



*Coral fragments incubated at decreased pH conditions in a controlled aquarium system. Bottom pictures showing coral primary polyps observed with a fluorescent microscope and with a scanning electron microscope.*

## Chiara Conti

I am a newly recruited direct PhD student, currently working in Dr. Steindler's marine microbiology lab. The topic of my research is the symbiotic relationship between marine sponges and cyanobacteria. Since phylum Porifera is a basal group of eumetazoans, investigating the host-microbe interaction in this system may shed light into the more complex systems on higher rungs of the ladder of evolution. The model I am currently working on involves the demosponge *Petrosia ficiformis* and the cyanobacterium *Synechococcus feldmannii.* I am using fluorescent activated cell sorting and microscopy to investigate special sponge-derived structures aimed to host symbiotic bacteria, called bacteriocytes. *S. feldmannii* is a cyanobacterium that apparently occurs

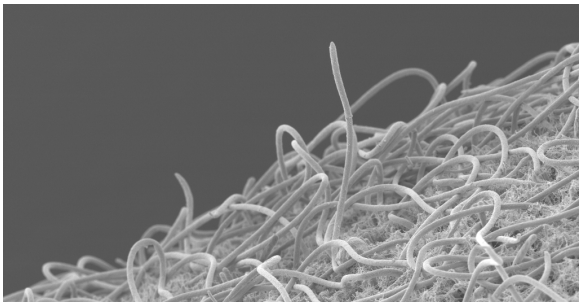
both as a free living and as a symbiont. I aim to isolate, cultivate and study this bacterium, in order to understand the nature of the unique symbiosis with its host.



*Confocal microscope picture of dissociated cells from sponge tissue. The sample is highly enriched in the strongly fluorescent, elongated cyanobacterium Synechococcus feldmannii, and the round, less fluorescent sponge cells are visible as well.*

### Menahem Korzets

I am an MSc student at Tamar's Lotan lab that specialize in cnidarians developmental biology and molecular ecology. I am at my second year of my master's degree and I have been focusing on the impact of the $GABA_B$ receptor signaling on cilia dynamics in the developing starlet sea anemone, *Nematostella vectensis*. As part of my research, I use different modulators to activate the $GABA_B$ receptor during *Nematostella* early developmental stages follow by testing the sea anemone behavior, morphology, gene and protein expression and metabolism with an emphasis on motility and cilia dynamics.



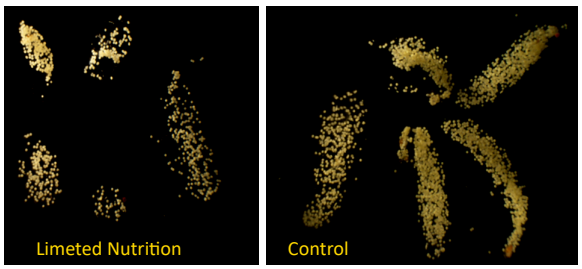
*Cilia of Nematostella vectensis planula*

## Outstanding poster awards

### Irit Shaim

I'm second year MSc student under the supervision of Tamar Lotan, currently in maternity leave with my first child. In my research I'm trying to reveal the molecular mechanism that couples nutrition, insulin signaling pathway and oogenesis in the sea anemone *Nematostella vectensis*. The phenomenon of offspring quality decline and infertility during female starvation is widespread among Bilateria. We found that nutrition plays an important role in *Nematostella* reproduction and that Insulin-like Growth Factor (IGF) expression

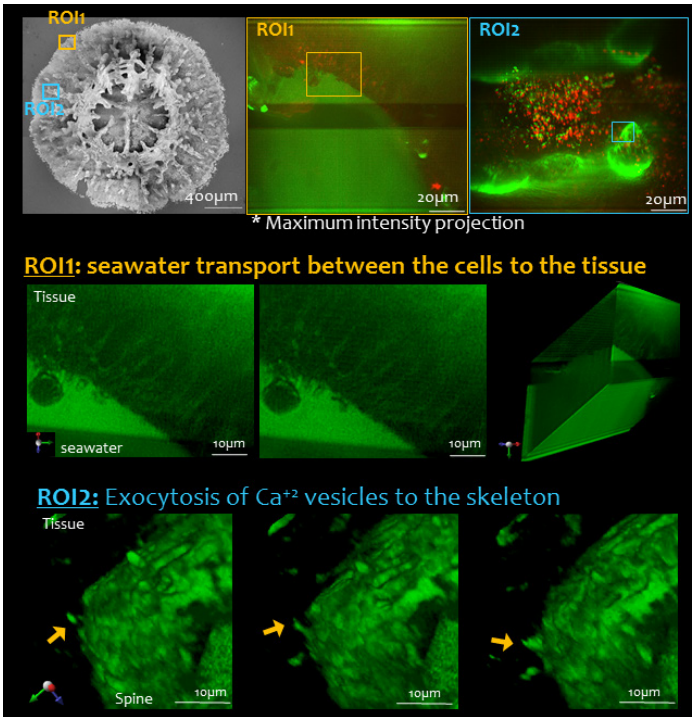
levels change during nutritional limitation. Furthermore, nutritional limitation has an immediate effect on their reproduction capability. Our findings shed light on an evolutionarily conserved basal process regulating oogenesis.




*Nematostella egg sack in limited nutrition condition versus control*

## Maayan Neder

I'm a PhD student with Dr. Tali Mass at Haifa University and I'm based at the Interuniversity Institute for Marine Sciences in Eilat, studying coral biomineralization during early development stages. My research is dealing with few aspects on how corals are initiating and developing their exoskeleton. The first aspect is how the skeleton is initiated, which crystal shapes and structures are appeared, and how it is develops. I'm trying to understand how the animal is concentrating some of the seawater ions into the skeleton. Last aspect of my research is how the mineral is formed across the diel cycle. My research combines verity of microscopy and spectroscopy methods, together with molecular approaches.

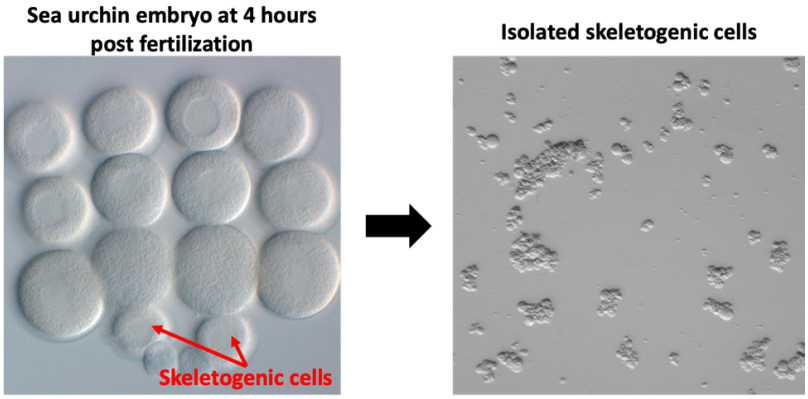



*live imaging of Stylophora pistilata primary polyps, using lattice light sheet microscope. The images shows how calcium ions are transferred from the external seawater to the skeleton. Two types of transports are involves; passive transport between the cells, and active transport via vesicles.*

### Majed Layous

I am a PhD student in the laboratory of Dr. Smadar Ben-Tabou de-Leon, where I have also did my MSc degree. Our lab studies embryonic development and molecular mechanisms that control developmental processes and their evolution. We use the sea urchin embryo as a model organism and concentrate on the sea urchin skeletogenesis as a model of human angiogenesis.

In my current project, I expand my research to the field of mechanobiology. I hope to illuminate the molecular mechanisms that enable cells to sense the rigidity of their environment and translate it into the modulation of developmental gene regulatory network that control skeletogenesis.



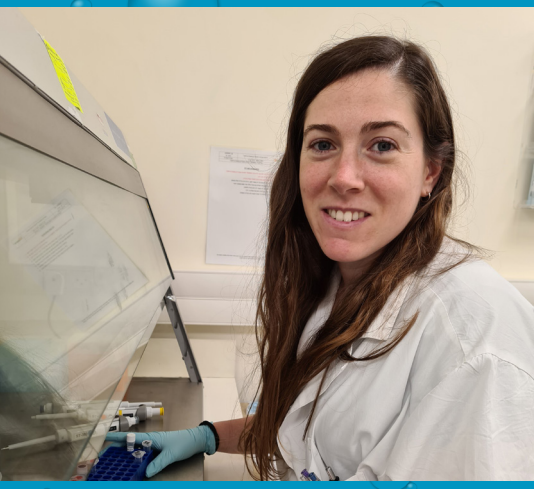

## Where are they now? Our alumni today

### Maya Britstein – Project Manager at GreenOnyx

After ten years in the academy, armed with 2.85 academic degrees, I was eager to peruse my career in the biotechnology start-up world. First step in this journey was to rewrite my CV. I was afraid that I had no applicable skills, and that I was not an expert in any field. However, a dear colleague told me that I know more than I think. The job hunt was a difficult step. I sent my CV to multiple companies and ultimately was invited to only 3 interviews. I was extremely nervous during my first interview, with sweaty palms and increased heartbeat. Needless to say, I did not get the job. For my second and third interviews, I came prepared, asked questions and enjoyed myself. Needless to say, I got the jobs. During the interviews I learned that it is important to understand exactly what job you are applying to, what is the work environment and to hear about the company's perks (yes, there are perks). I decided to go with where I work today, GreenOnyx. In GreenOnyx my job is the company is to develop sterilization protocol to complex isolators. I started in part time position for three months while I finalize my PhD thesis. The first few months I

learned that about sterilization methods that were foreign to me beforehand. I was closely trained by my supervisor, until he felt I was ready to plan and execute experiments by myself. In the beginning it was difficult to adjust to the long working hours, however, I enjoy the "target oriented" work in the biotech world. Every week I define my tasks for the week and by the end of the week, I review the tasks with the manager, and set the tasks for next week. After a year in the company, I know that I acquired many skills during my studies, and that I am an expert in many fields.

## Shelly Reuven – Molecular biologist at Hazera



I am working in Hazera, a global leader in the seed industry. Hazera breeds, develops, produces and markets varieties and seeds in a wide range of vegetable crops around the world. I am responsible on the molecular biology analysis in the lab. This responsibility includes performing validation on new devices, and developing new protocols for the detection of newly emerged pathogens that pose global agricultural threat. I am working in the health laboratory and testing different crop seeds for pathogens. The tests vary from classical microbiology methods, to ELISA and state of the art molecular biology methods. I did my master's in the Marine Biology Department in Dr. Tamar Lotan's lab. In my MSc research, I used molecular methods to identify molecular pathways that lead to spawning in the sea anemone *Nematostella vectensis*. I gained a lot of experience that is helping me in my current job and in the future I would like to do my PhD also in the field of molecular biology.

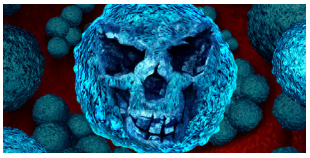
## Gal Dishon – PostDoc in Scripps Institution of Oceanography (UCSD)

In my postdoc, conducted at Scripps Institution of Oceanography at the University of California San Diego, I have the opportunity to take part in a project that might directly and significantly reduce human impact on earth's climate in the coming decades. A significant portion of all global greenhouse gas emissions is associated with Methane emitted by the cattle industry (mainly from cows' burps). Methane, which is an extremely potent greenhouse gas, is fortunately also relatively short living, and thus predicted to respond quickly to any successful mitigation efforts. One promising approach for the reduction of methane emissions is feeding cows with the red seaweed *Asparagopsis taxiformis* which was shown to virtually eliminate methane in cow burps. Yet to date, no commercial-scale *Asparagopsis* production is available. As part of my postdoctoral research with Prof. Jennifer Smith's lab, I am working on optimization and upscaling of *Asparagopsis* cultivation, along with some basic biology of this fascinating alga. Working and living in San Diego is awesome. The weather is perfect and people are extremely nice. The ocean that is just by the lab might seem cold at first for Mediteranneans, but almost every day is a surfing day and the kelp forests and sea lions invite you to swim, so it's easy to get used to the temperature and enjoy the wonders it presents.

# Selected popular interviews and reports:

New hope for coral reef

https://erc.europa.eu/projects-figures/stories/new-hope-coral-reefs



האם הפתרון למחלות הוא ציתות לשיחות בין חיידקים?

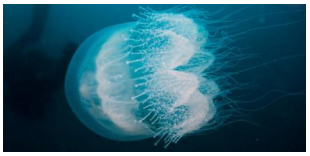
https://www.mako.co.il/health-illnesses-and-medicines/medicines/Article-b8f5ab76e443071026.htm?utm_source=Whatsapp&utm_medium=Share&Partner=Whatsapp_Share

סנפיר זהב: התרומה הבלכלית של הכרישים בחדרה

https://www.ynet.co.il/articles/0,7340,L-5513086,00.html

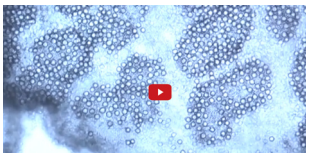
כשקיפוד הים "עדכן את התוכנה" הגנטית שלו

https://www.ynet.co.il/articles/0,7340,L-5537387,00.html



תגלית ישראלית: כך שוחות המדוזות נגד הזרם

https://www.ynet.co.il/article/Sky51ggGU



חומץ? ממש לא: כך תטפלו בצריבת מדוזה

https://www.ynet.co.il/articles/0,7340,L-5306030,00.html#autoplay

צפו: נחמה הכרישה הלווינית הראשונה בישראל

https://www.ynet.co.il/articles/0,7340,L-4728591,00.html

שבת של כרישים בפארק נחל חדרה

http://beshvilhaarez.parks.org.il/article.asp?item=145

למצוא בים את הסטארט אפ הבא

https://www.ynet.co.il/articles/0,7340,L-5589774,00.html

האנשים שהפכו את מעמקי הים למקצוע

https://www.ynet.co.il/articles/0,7340,L-5582142,00.html


*Have a great summer*

*מאחלים לכולם חופשת קיץ מהנה*