

The Department of
Marine Biology

Alumni newsletter

Keeping in touch with the Marine Biology
Department after you graduate



H. Nativ

July 2019



Dear students and alumni,

We had a full and interesting academic year. Together with the three other departments of the Marine School, we took part in a strategic program to redefine our goals and tasks for the coming years. As part of this process, I am pleased to announce that from next year, our MSc program will become international. This will ease the bureaucracy for our already enrolled international students and will attract more students from abroad. We opened the year with 16 new MSc students and eight new PhD students, and we are now about 60 students strong. In the fall semester, we enjoyed many interesting and tasty talks of our graduated students. Most of them have already found a job (read below) or have continued to PhD studies. We wish all of them good luck and especially to our three students who have been with us for many years and now have officially gained their PhDs: Dr. Gal Dishon and Dr. Shani Levy, who continued to a postdoctoral research, and Dr. Amikam Bar-Gil, who has initiated his own start-up in the North. Along with the rise in student number, in November we inaugurated the second laboratory building in Sdot Yam together with the donor, Mr. Morris Kahn, and a new lab is currently being built for Prof. Ilana Berman Frank. This year we have changed the structure of several courses and opened new courses: an AAUS scientific diving course that had just been successfully completed and two additional courses, which will be given in the next month. One, headed by Prof. Michael Krom, will be on how the Eastern Mediterranean Sea works, and the other, led by Prof. Stephen Kajiura from Florida Atlantic University, on elasmobranch (sharks, rays, and skates). We were also fortunate this year to host guest scientists from all over the world, among them Dr. Sylvia Earle, a legendary oceanographer and explorer, Prof. Paul Falkowski, the Director of the Rutgers Energy Institute and Dr. Neil Hammerschlag from University of Miami, who gave a keynote lecture in Sdot Yam on ecosystem impact on sharks. In the last summer, the department announced a call to recruit new faculty

members and I am happy to welcome our new colleague, Dr. Tal Luzzatto Knaan.

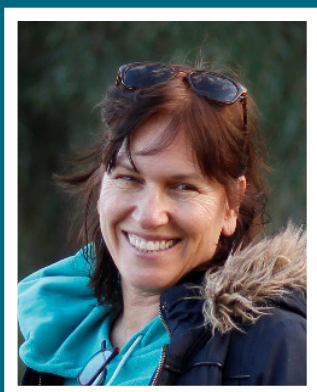
We have been in contact with many of our alumni and I would like to thank you all for your interest and care. Please stay in touch and let us know what you are doing.

Wishing you a great summer,

Dr. Tamar Lotan



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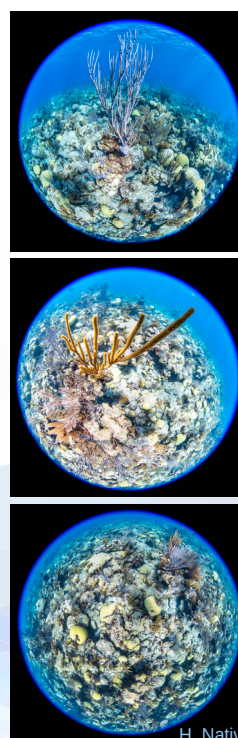


Dear students and alumni,

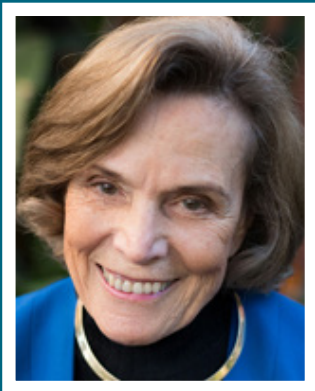
Time passes quickly. It is already just over a year since I joined the team of the Leon H. Charney School of Marine Sciences (CSMS), a year since the first newsletter from the Department of Marine Biology was published, and a year with new MSc and PhD graduates leaving the School for the real world. This year has been busy for the School as the CSMS faculty and staff joined to evaluate our strengths and challenges in a School-wide strategic process whose goal was to reexamine and clarify the School's vision and mission as well as to provide strategic pathways and initial plans with which to achieve our objectives in the next decade. In line with the original goals set forth upon the establishment of CSMS, our mission is to provide science-based leadership for our sustainable future with the sea by striving towards our vision to become the leading academic center of excellence for Marine Sciences in the eastern Mediterranean. Accordingly, during this next decade we aim to stimulate academic excellence by recruiting new faculty and research-support staff, attracting quality students, developing educational programs for the next generation of marine scientists, and by expanding our physical infrastructures. We have presented our strategy and plans before the University's top administration and are continuing our efforts to gain the support required to make our vision a reality. Accordingly, this coming October two new faculty members will join us in the Departments of Marine Biology and Marine Technologies and bring with them exciting new fields of expertise benefiting the entire School. We foresee a decade of growth with new academic programs in Marine Sciences geared for students of the 21st century, attracting top students and postdoctoral fellows by competitive scholarships, by continued recruitments of new faculty and staff positions for all departments, and focusing on academic excellence. For our growing School we plan to establish a new coastal location (within the city of Haifa) with the expanding Charney School of Marine Sciences forming a vibrant and stimulating nucleus for a marine hub that will bring together marine-based start-ups, commerce, marine related outreach and tourism. To materialize our vision, we need extensive resources. We hope that as graduates of our school you will join our efforts and support us as we move ahead to become an important center of marine sciences in Israel and the region.

Enjoy the summer,

Prof. Ilana Berman-Frank



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Legendary oceanographer and explorer

Dr. Sylvia Earle – recipient of Doctor of Philosophy, Honoris Causa

Dr. Sylvia Earle is one of the most familiar figures in Marine Sciences today. She has been an advocate, scientist, policy maker, inventor, businesswoman, and passionate ambassador for the sea for six decades. She is one of the founders of Ocean Engineering Company, which manufactures and operates conventional and robotic subsurface systems and was the first scientific director of the National Association of Oceanography. Her work has been recognized by high-ranking journals and she has been awarded more than 100 international honorary degrees. Dr. Sylvia Earle initiated Google Earth's Ocean app, launched and headed the National Geographic Sustainable Seas expeditions and assisted in the designation and expansion of protected marine areas around the world. She has led more than 70 expeditions totaling more than 6,000 hours underwater.

We were fortunate to have her joining us for a dive with our students in the scientific diving course, followed by a fascinating talk on the sea, "the blue heart of the planet."





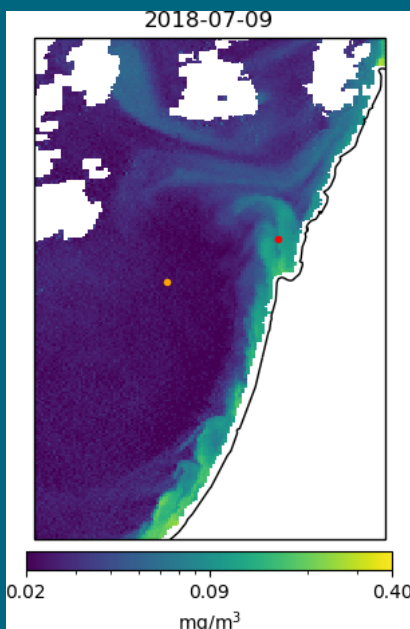
Taking the pulse of the Eastern Mediterranean by Dr. Daniel Sher

You wake up in the middle of the night feeling unwell. You are tired, feel a bit nauseous, maybe a bit of a headache... In the morning, you go to the doctor, who takes your pulse and temperature and tells you they are both “almost OK”. Maybe you have something, but maybe it is just your natural physiological variation. The doctor may just tell you to rest, but if it persists, you may be sent to do blood tests, so that these can be compared to your medical history and reflect your physiologic state. If there is a need, the doctor may, finally, prescribe you some medicine.

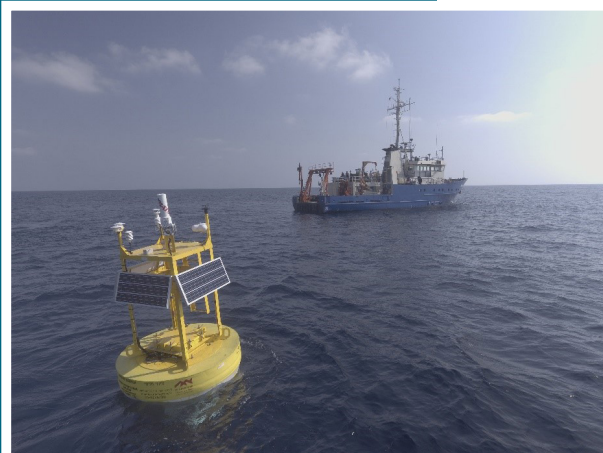
But what happens when the patient is an ecosystem, like the sea? We all know that, sometimes, the Israeli coast of the Mediterranean is a bit unwell. At times, we can see it is polluted, at times it seems to be infected by some weird organisms that might be found there under natural conditions but now they are growing and cause damage (e.g. jellyfish). An over the last few decades, its temperature seems to be rising. Are these just the natural dynamics of the system, or is something really amiss? Diagnosing the condition of the Eastern Mediterranean, and identifying whether what we are seeing are just natural cycles, minor illnesses or something more serious, requires us to “take the pulse of the sea” regularly, as well as to collect some detailed measurements at times so that we have a decent “medical history”.

During the last few years, the Charney School of Marine Sciences (U of Haifa) has taken some major steps towards these goals. Two ocean observatories, THEMO-1 and 2, continuously monitor the basic “vital signs” of the sea – temperature, salinity, the concentration of chlorophyll at the sea surface (a proxy for the abundance of the single-celled microalgae that are the base of the food chain) and a variety of other measurements. These data, collected every few minutes, are transmitted in real-time to the university, where they are available to the entire community on the THEMO website (visit <http://themo.haifa.ac.il/> to see the latest measurements). The resulting high-resolution time-series provide a baseline of the physical, chemical, and biological conditions of the ecosystem (akin to taking the pulse of a person every few minutes) and can help us identify short-term, ephemeral events such as intrusions of coastal water into the open ocean and potentially algal blooms.

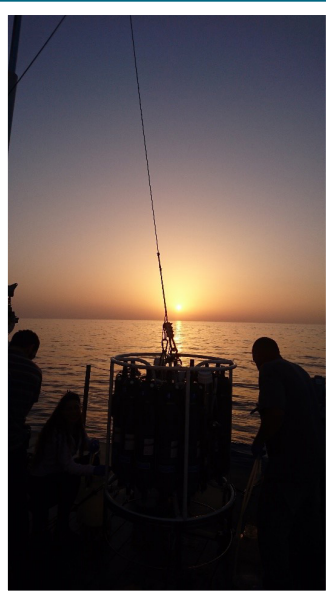
Just as the basic vital signs of a patient need to be combined with in-depth tests, the THEMO data need to be augmented by in-depth analyses of the physics, chemistry and biology of the sea, using measurements that cannot currently be collected in real-time. To get these measurements, the Charney School has just finished an intensive series of monthly research



A satellite image of sea-surface chlorophyll, representing the populations of microalgae in the surface during the June SoMMoS cruise. Image courtesy of Misha Suchanov and Yoav Lehahn.



The THEMO-1 buoy, with the R/V Bat Galim at the background. THEMO-1 is found a few km offshore Achziv. Image by Hagai Nativ.

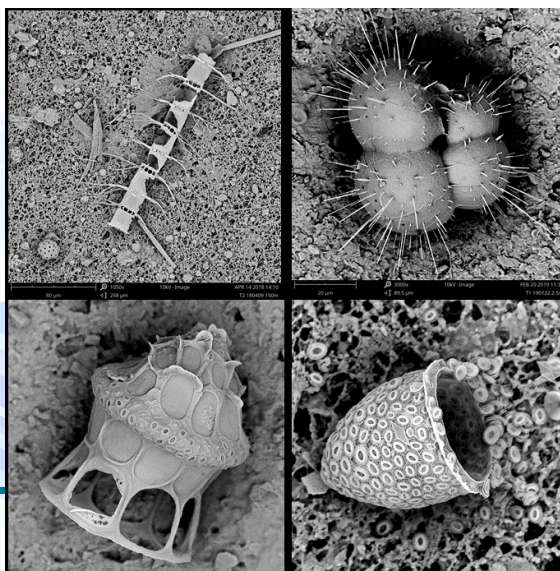


An evening on the deck of the R/V Mediterranean Explorer, preparing for a long night of sampling. Image by Daniel Sher.

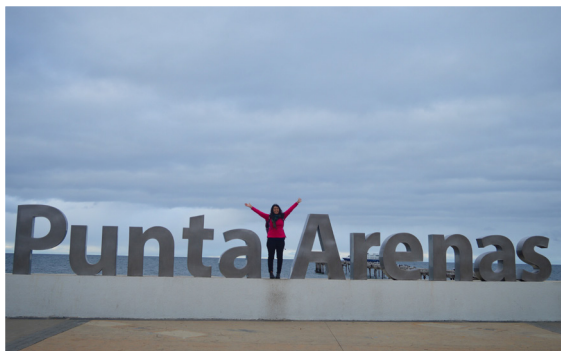
cruises to the THEMO sites. During this cruise series, recently given the palindromic name SoMMoS (Southeastern Mediterranean Monthly cruise Series), a multi-disciplinary team of researchers from the University of Haifa was joined by scientists from IOLR and from six universities in Israel and abroad. We measured, in addition to the vanishingly low concentrations of nutrients, various aspects of the carbonate system (the “buffer” of the oceans that indicates potential ocean acidification), as well as the greenhouse gas methane that may be seeping from the sea floor. Other researchers focused on the amount and diversity of phytoplankton and bacteria. These data are now being analyzed and combined with remote-sensing data (from satellites) to add also the spatial aspects of the system.

Finally, the Morris Kahn Marine Station at Sdot Yam provides a third layer of information, focusing on the macro-organisms that inhabit the sea. These include the invertebrates living on the rocky reefs and the sea floor, the fish and the top predators – sharks, rays and marine mammals. We already demonstrated that we should declare some areas as marine protected areas if we want to continue to have dolphins along our shorelines. The station also monitors the pathogens of these megafauna and also of smaller marine animals such as fish and shellfish, for example studying how the health of native fish is affected by the presence of mariculture cages, and vice versa. We routinely collecting blood samples from sharks, guitarfish and sea turtles to evaluate the health status of this special important patient....our Sea.

Common to all of these efforts is the overarching goal of making the resulting data freely available to the entire community. The more “doctors” look at the Eastern Mediterranean, the more we can understand how it changes over time and space and hopefully provide the scientific information that will enable us to responsibly utilize the resources of the sea, while maintaining its riches for future generations.



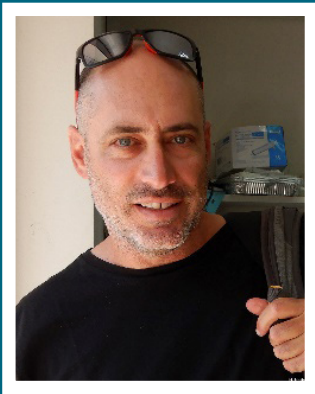
Scanning Electron Microscope images of some of the beautiful planktonic microorganisms inhabiting the Eastern Mediterranean. Image courtesy of Sabine Keuter and Miguel Frada from the Hebrew University and IUI.



PhD student Debbi Ramon was chosen to go on shipboard training

The South North Atlantic training program (collaboration between the Alfred Wegener Institute and the Partnership for Observation of the Global Ocean, with support of the Nippon Foundation and ATLANTOS) is a unique month long program providing shipboard training to young marine scientists from all over the world. We, 23 scholars, boarded the RV Polarstern, crossed the entire Atlantic Ocean, and had the opportunity to learn from experts in the fields of climate change, oceanography, microbial processes, microplastics, remote sensing, outreach, and more. While a major focus was placed on collecting scientific data, there was an equal emphasis on international collaboration, our changing climate, and the importance of encouraging marine research and education. All of us return to our home countries motivated to continue in marine sciences and pass on the message that it is our responsibility as scientists to initiate change for us and for future generations.





Sharks' behavior in the Eastern basin of the Mediterranean Sea

by Ziv Zemah Shamir

Marine top predators face unprecedented challenges, dealing with ocean overexploitation and climate change that affect the abundance and distribution of top predators in ocean ecosystems. Sharks as secondary consumers play a vital role in coastal and marine ecosystems by regulating the ecosystem, removing the weak and sick fish and maintaining the tropical levels in the ocean. Understanding the ecological patterns, evolutionary constraints and ecosystem functions and processes are critical for preventing extinctions, loss of biodiversity and depletion of the ecosystem services.



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Shark tourism is a new concept that has not yet been recognized in Israel. While the principles and regulation of shark tourism in particular and wildlife tourism in general are developing rapidly worldwide, in Israel we are only at the very beginning of this process. The aggregations of sharks near the power plant in Hadera in the winter months, are a source of interest and attraction for many people, including swimmers, divers, and kayakers. The desire of tourists, and therefore of local businesses as well, to take part in this amazing and profitable phenomenon poses certain risks, in view of the lack of regulation in the area. In my research I analyze the ecological-socioeconomic consequences of shark tourism as well as the risks of visitor pressure for the environment. Our observations suggest that human divers might disturb the sharks and influence behavioral changes. The goal is to find the ecological-equilibrium point, under different scenarios and to analyze the effects of humans on sharks vitality and welfare.

Part of the paragraph is taken from our published short communication: Zemah Shamir, Z., Zemah Shamir, S., Becker, N., Scheinin, A., & Tchernov, D. (2019). Evidence of the impacts of emerging shark tourism in the Mediterranean. *Ocean & Coastal Management*, 178, 104847



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5th Academic Get-Together

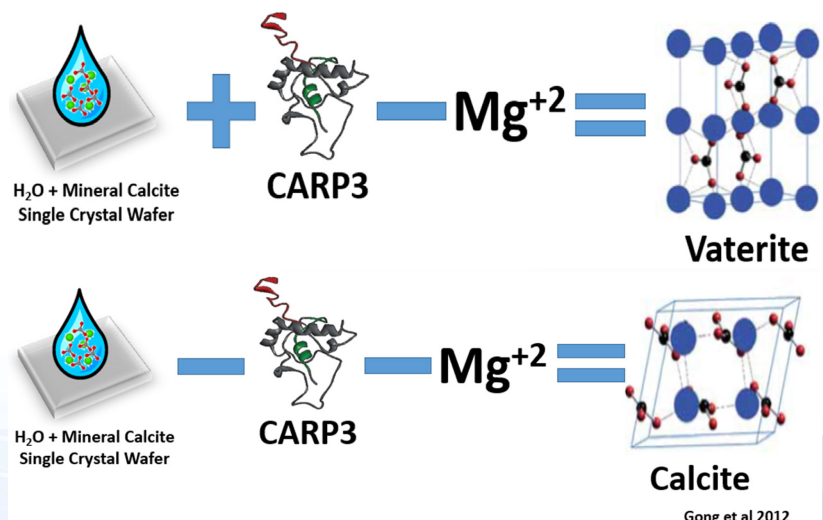
The 5th academic meeting of the Department of Marine Biology was attended by about 70 PhD and MSc students, postdoctoral fellows, principal investigators, research fellows and scientists. The meeting included lectures by students from different research groups and a guest lecture by Arik Rosenblum, CEO of EcoOcean. In addition, more than 30 students presented their projects in two poster sessions. At the end of the meeting, prizes were awarded to the three best posters and talks.



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

Ra'anan Laipnik

I am 32 years old, from Kibbutz Ma'abarot. I have a B.Sc. in Marine Biology and Oceanography from Ruppin Academic Center and I am currently at the end of my M.Sc. studies at the Leon H. Charney School of Marine Sciences at Haifa University. After graduation, I aim to join the world of biotechnological innovation in the industrial sector.



My research goal is to understand the functionality of a highly acidic protein named CARP3, which is derived from the stony coral *Stylophora pistillata* through the biomineralization of calcium carbonate in vitro. This protein has been associated with skeletal formation of the coral and, thus, it is



important for us to understand what calcium carbonate polymorphs it can precipitate (e.g. calcite, aragonite or vaterite). I found that when CARP3 is placed in solutions that do not contain magnesium, it is able to inhibit the crystallization of calcite and favors the precipitation of vaterite.

Sofia Sizikov

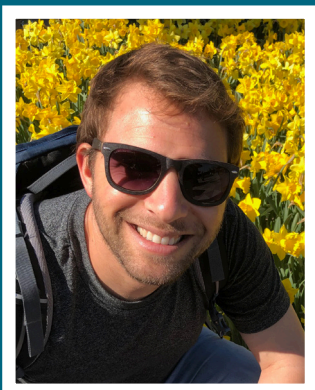
I have just finished my M.Sc. studies in the laboratory of Dr. Laura Steindler in the Department of Marine Biology, Charney School of Marine Sciences. My work there was a continuation of a third-year project of my B.Sc. studies in Haifa University.

In my research, I concentrated on the interactions between marine sponges and their symbiotic bacteria. A part of my research was a bioinformatics project, whose purpose was to compare genomes of symbiotic and free-living bacteria and to reveal potential ways of adaptation of the symbionts to life inside their host.

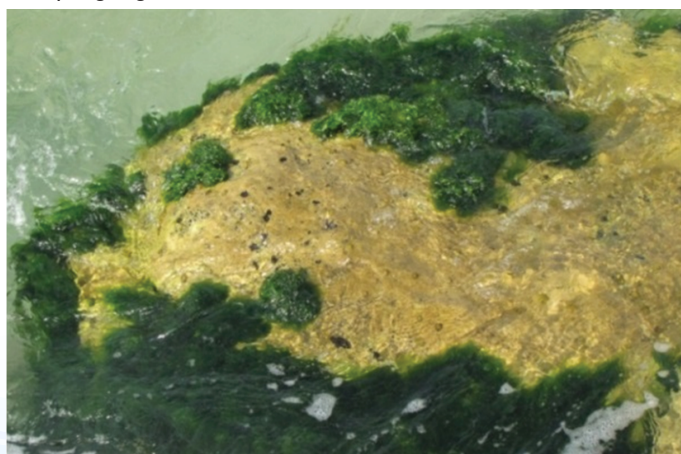
Currently, I am working in a company in Haifa that develops cancer therapeutics.

Ynon Deutsch

I have joined Haifa University a year and a half ago for my PhD with Prof. Ilana Berman Frank and Prof. David Ezra. My lab is located in Volcani Center, an agricultural research organization where applicative researches are being conducted. My bachelor's degree was in marine biology (Michmoret) and



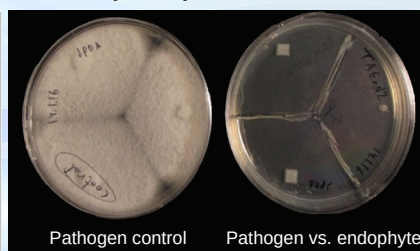
Sampling Algae



Isolating Endophytes



Bio Activity assays



after that, I worked in the industry at a tropical ornamental fish breeding company and in a micro-algae biotech company. In my master's degree, I studied fish physiology and microbiology. I still don't have any plans for the post-PhD period, but all options are open: academy, industry etc.

Diseases are a major and influential harmful factor in the aquaculture industry around the world. Chemical pesticides and antibiotics are widely used to cope with aquaculture pathogens. Currently, the ability to deal with those pathogens is very limited. Endophytes are microorganisms that live inside the plant tissue without causing external symptoms. The plant provides a living niche and food for the endophytes, while the endophytes provide protection against pathogens, pests and induce tolerance to abiotic and biotic stresses. We are trying to take advantage of this capability of the endophytes for our benefit, by isolating and characterizing endophytes with significant biological activity and use them as control against pathogens and pests in aquaculture.



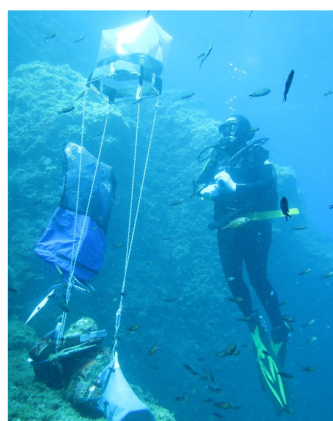
Shira Givati

I am a master student under the supervision of Dr. Daniel Sher (UH) and Dr. Eyal Rahav (IOLR). My field of interest is marine microbiology, which studies the role of bacteria in the marine environment. My research focuses on different factors affecting the macromolecular composition of bacterial cells, mainly temperature and growth rate. We anticipate that a better understanding of the bacterial physiology in both lab and field may help explain large-scale oceanographic phenomena, such as possible outcomes of biogeochemical cycles and global warming. Currently, I am finalizing my thesis and proceeding for PhD.



Maya Britstein

I have been passionate with the Sea from the BSc at Michmoret, Ruppin Academic Center. I then continued to 6 years of MSc and a PhD studies at the Department of Marine Biology, studying marine microbiology in Dr. Steindler's lab. My research focus was on marine sponges and their interaction with symbiotic cyanobacteria. Presently, I am writing two articles, which provide evidence for environmental uptake of specific symbiotic cyanobacteria by sponges, on the roles of cyanobacteria in sponge symbiosis and on sponge gene expression in relation to uptake of symbiotic cyanobacteria. Recently, I received a job as a microbiologist in a biotech company that grows aquatic plants as supplements for green vegetables.

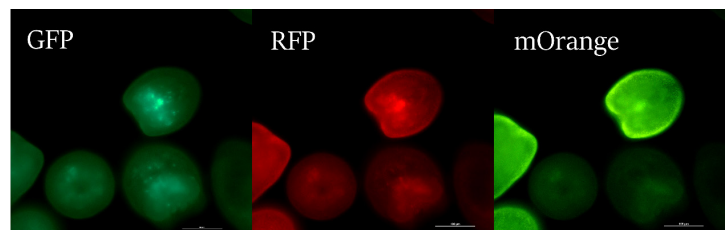




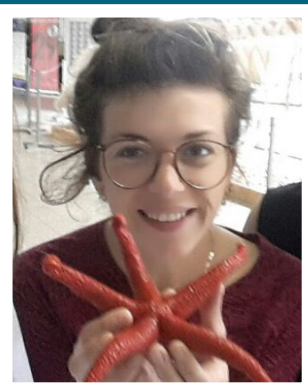
Irina Irit Shaim

I'm a sea lover and a fan of nature and food. I started my M.Sc. studies at Leon H. Charney School of Marine Sciences in October 2018. I got my B.Sc. degree in Marine Biotechnology from Ruppin Academic Center. After my studies, I aspire to start a career in the biomedical industry.

I'm working on my research at "Cnidarians Development Biology and Molecular Ecology" lab, under the supervision of Dr. Tamar Lotan. My genetic model organism is the sea anemone *Nematostella vectensis* and the aim of my work is to uncover the molecular processes underlying primordial germ cell (PGC) differentiation. In order to achieve that, I am using PL10 transgenic anemones.



Transgenic PL10 planulae, Photo: Neta Sa'ar



Miri Morgulis

Possible cooption of a VEGF-driven tubulogenesis program for biomineralization in echinoderms

The sea urchin calcite spicules and vertebrate blood vessels are quite distinct in their function, yet both have a tubular structure and are controlled by the vascular endothelial growth factor (VEGF) pathway. We study the downstream program by which VEGF signaling drives sea urchin spiculogenesis and find remarkable similarities to the control of vertebrate vascularization. The similarities are observed both in the upstream gene regulatory network, in the downstream effector genes, and the cellular processes that VEGF signaling controls at the site of the calcite spicule formation. We speculate that sea urchin spiculogenesis and vertebrate vascularization diverged from a common ancestral tubulogenesis program that was uniquely coopted for biomineralization in the echinoderm phylum.





Where are they now? Our alumni today

Dr. Amikam Bar-gil

I established Yemoja Ltd (<https://yemojaltd.com>) in 2017 with three other members. Yemoja has developed a unique patented micro-algae growth system for the production of bioactive compounds for the cosmetic and pharmaceutical industry. We combined knowledge from microbiology, engineering, optics and biotechnology in order to create a mass cultivation system that is completely autonomous and computer controlled, which eliminates the need for human personnel during the cultivation process. After completing our proof of concept and proof of technology, we succeeded to raise enough money to build our first industrial-scale facility in Tel Hai industrial park. The skills and thinking capabilities were all gained during my studies at the Marine Biology School under the supervision of Prof. Dan Tchernov and with the help of Dr. Eli Shemes.



Lama khalaily



Where do we go from here?

From personal experience, it can be pretty scary going into master graduation and working out what to do next. The biggest decisions will be what to do next and where to do it, for example PhD, work, new field etc. I have no doubt that my time at the Marine Biology Department provided me with the best professional training, but I wanted to get exposed to real work experience before I make big career decisions. Currently, I am working at The Simon Winter Institute for Human Genetics, Bnai Zion Medical Center, Haifa. I am grateful to have had the opportunity to work there. This experience has helped me to figure out what I want and gave me a better mindset to begin planning my career. Now, equipped with a new set of professional, academic and personal tools, I am ready to continue to PhD studies.

Dr. Yotam Popovich



I completed my PhD in marine biology under Dan Tchernov's guidance, utilizing the fields of biophysics, field work, ecology and bioinformatics. I use this knowledge in my role as VP R&D for "Abundance", a *Spirulina platensis* growth and extraction facility specialized in pigments and as CTO for "Shalem", a start-up envisioning a unique versatile photobioreactor. As part of my work, I establish connections with other companies and researchers, write grants for funding and look for new and exciting ways to utilize cyanobacterial/microalgae. Most important, I am in charge of new product development, executing R&D programs and delivering the bottom line: feasibility at different volume scales and its price tag.

My training as a multidisciplinary scientist helped me a lot when looking for a management job. The ability to combine several scientific fields into a coherent uniform view was implemented in me during my PhD years, a skill set that was taught and encouraged by MARSCI. A strong drive to succeed and hard work also played a major part. Whether it's cyanobacteria, some unique microalgae or an exciting new biotechnology, it can all be self-taught in a short time. Research training, project management and a role model supervisor during my PhD years were the key for securing a position in agritech.



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Jellyfish Sea Haifa Bay

Have a great summer
מאתאים לכולם חופשת קיץ מהנה