

"Qwaterly" drop: In this issue, we summarize a competition from Miami, where the Water Research Center at Tel Aviv University (WRC-TAU) team won first place, and gave a brief insight into an innovative concept to remove contaminants from water bodies. ENJOY!
Sincerely, Qwaterly

Miami, Florida, April 2019

Prof. Dror Avisar & Dr. Yaron Zinger

One of Florida's most critical issues is stormwater runoff. Seeking a solution, TAU and the Florida cities of Miami, South Miami and North Bay Village established the first-ever LocalTAU competition. Two out of fifteen applicants got to the finals: Hydro Biofilters, which proposes building multilayered biofilters to direct stormwater away from city streets, purify it and turn it into an easily accessible water resource, and The Drain Box, which proposes dividing stormwater runoff into: domestic collection from roofs and balconies into home-adjacent containers, and municipal collection diverting runoff to an underground infiltration box, and a much smaller portion into the bay. Hydro Biofilters was proposed by Prof. Dror Avisar and Dr. Yaron Zinger from WRC-TAU, and The Drain Box was proposed by Dr. Ines Zucker, and Gil Nisim, a MSc candidate. In mid-April, the finalists gathered at CIC Miami to pitch their innovative solutions to an audience of nearly 100 people, among them South Florida government officials and stakeholders, and local and national American Friends of TAU leaders. The LocalTAU competition used "Shark Tank" style rules. Both teams were given 10 minutes to present their innovative solutions and then faced a round of questions from the judges' panel. Judges included: Dr. Frances Colón, former highest-ranking Hispanic scientist in the Obama State Department; Col. Alan M. Dodd, director of the City of Miami Department of Resilience and Public Works; Melissa Hew, program manager in the City of Miami Office of Resilience and Sustainability; Denise O'Brien, chair, North Bay Village Sustainability and Resiliency Task Force; Zac Cosner, City of South Miami director of environmental health and safety

at Florida International University (FIU); and Michael Rupinski, environmental compliance officer at FIU. The judges challenged both teams on the sustainability of their potential solutions in light of Florida's frequent hurricanes, coordination and sequencing issues, concerns about mosquitos and the Zika virus and ultimately, the cost of implementation. The judges then offered their analyses of the proposals, providing commentary on the pros and cons of each. They ultimately preferred the Hydro Biofilters proposal, citing its low cost and sustainability, and announced this proposal to be the winner, awarding \$20,000 to begin researching and piloting practical implementation of the solution.

Prof. Avisar indicated that for him and for Dr. Zinger, LocalTAU's pitch competition and meeting with South Florida leaders and officials opened up a new area of the United States that urgently needs innovative solutions to water issues that are intrinsically tied to climate change, including sea-level rise, saltwater intrusion, and stormwater, and pose serious threats to the Sunshine State. He admitted that winning the Competition is "icing on the cake" and that they are looking forward to the next steps. Finally, he thanked the leadership of LocalTAU and American Friends of TAU for the opportunity.

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Figure 1a.: LocalTAU leadership and board members stand proudly with the two competing teams: Hydro Biofilters and The Drain Box. Figure 1b. Prof. Dror Avisar and Dr. Yaron Zinger pose for a photo after being announced competition winners for their Hydro Biofilters proposal

Conferences:

January 2019 – Analyticon 2019 – Analytical and Bioanalytical Methods Conference, San Francisco, CA, USA. This unique conference, in which analytical experts discuss best practices within laboratory research and therapeutic approaches, took place at the end of April. Prof. Avisar gave a keynote presentation on the treatment concept of degradation of chemotherapeutic drugs derived from an oncology center, while Dr. Gozlan delved into the subject of pharmaceutical degradation products as hidden contaminants in the aquatic environment.

Focus on Silica Aerogels for Adsorption and Recovery of Organic Compounds:

Owing to their high surface area and good adsorption-desorption of organic compounds, silica aerogels are used to extract compounds from wastewater. We have studied the adsorption and recovery of chemotherapeutic drugs such as cyclophosphamide (CYP), doxorubicin (DOX), dexamethasone (DEX) and paclitaxel (TAX). These aerogels also showed excellent adsorption of diethyl phthalate (DEP) from tapwater and synthetic leachate. These results provide us with a proof of concept for the use of these aerogels to remove contaminants by adsorption and recovery.

New publications:

Vered, G. Kaplan, A. Avisar, D. Shenkar, N. (2019). *Using solitary ascidians to assess microplastic and phthalate plasticizers pollution in marine environments*, Marine Pollution Bulletin, 138, 618-625.

Kronfeld, J. Carmi, I, and Avisar, D. (2019). *The Yarkon-Taninim aquifer (Judea Group Israel): continuous or discontinuous?-verdict by radiocarbon*. Radiocarbon, DOI 10.1017.RDC.2019.51

Friedman, L., Mamane, H., Avisar, D., Chandran, K. (2018). *The role of influent organic carbon-to-nitrogen (COD/N) ratio in removal rates and shaping microbial ecology in soil aquifer treatment (SAT)*. Water Research, 146:197-205

Horovitz, I. Avisar, D. Luster, E. Lozzi, L. Luxbacher, T. Mamane, H. (2018) *MS2 bacteriophage inactivation using a N-doped TiO₂-coated photocatalytic membrane reactor: influence of water-quality parameters*. Chemical Engineering Journal, 354 (2018): 995-1006.

drugs in wastewater after various advanced oxidation processes, the use of metal peroxide catalysts for the degradation of micropollutants in wastewater, and the synthesis and fabrication of aerogels for adsorption of micropollutants from wastewater.

Projects and collaborations:

May 2019 – Stockholm Junior Water Prize in Israel 2019:

The Stockholm Junior Water Prize is held annually in Israel under the auspices of the Fleischman Faculty of Engineering at TAU, with the support of the Jewish National Fund – USA (in memory of Zevi Kahanov) and the Raquel & Manuel Klachky endowment, in cooperation with the ministries of Education and the Economy, the Water Authority and the WRC at TAU. It is administered by coordinator Helen Tanenbaum, with Prof. Emeritus Gedeon Dagan serving as the Academic Director.

This year, The Moshe Mirilashvili Institute at the WRC established, for the first time, a special prize for the best innovative project in the "Technology and Entrepreneurship" category. The winner, Haviv Mualem from the Baptist high school in Nazareth, presented his project "Producing and purifying water from the atmosphere" under the supervision of Dr. Osama Mualem and Alias Dahi. The jury was impressed by the innovative project, which took into account the production stage as well as the purification procedure. The pupil will receive a 1000 NIS cash prize.

Congratulations to the Graduates:

February 2019 – MSc. Charlotte Levine Fleming – on the topic "Can a standard framework be formulated to enable off-grid communities to use graywater (GW) for agriculture?"

April 2019 - M.A. Olga Miarov – on the topic "Pharmaceuticals in the environment – legislation and regulation processes: evaluation, challenges, and recommendations"

May 2019 - MSc. Daniel Zachor-Movshovitz – on the topic "Identification and examination of the removal efficiency of five chemotherapeutic drugs derived from Tel Ha'shomer hospital"

The Moshe Mirilashvili Institute:

The institute supports international collaborations and outstanding scientists:

Dr. Lakshmi Prasanna V. - is a postdoctoral fellow working with Prof. Dror Avisar. She is studying the recovery of expensive chemotherapeutic drugs from urine. She is also investigating the fate of chemotherapeutic

