BGU-FOR Research Center: Achievements and Plans

July 2025

The BGU-FOR Research Center is now firmly established as a unique hub in Israel focusing on advanced interdisciplinary translational research in Food systems, One Health, and Resilience. Since its inauguration in 2023, it has positioned itself to impact scientifically, strategically, and operationally working modalities. BGU-FOR is a nexus between academia, innovation, and policy, translating science into action with direct societal impact nationally and internationally.

BGU-FOR strategic objectives:

(1) Enabling research initiatives that set the stage for translational science in the areas of food systems, one health, and resilience

(2) Rostering applied research collaboration with Israeli and international academic institutions

(3) Advancing and sponsoring translational research

Our mission is to continue confronting the cascading challenges of food systems missteps, health inequities, environmental hazards, and degradation, and their impact on the One Health platform through integrated research and solution-oriented partnerships.

We are grateful to the Manya Igel Foundation for its generous support

Flagship Translational Research for Real-Life Solutions *(Currency used: USD)*

✓ **Sustainable Omega-3 Aquaculture** (Dina Zilberg, Inna Khozin-Goldberg, Avner Ronen, Osnat Gillor, Moshe Herzberg, and Avner Gros)**:** A first-of-its-kind, closed-loop aquaculture system converts fish waste into microalgal biomass rich in EPA omega-3. This system addresses nutritional deficits while enhancing environmental sustainability—offering global applications for climate-smart nutrition.

Presentations at conferences:

- Moshkovitz, M., Siboni, Y., Ronen, A., Khozin-Goldberg, I., Zilberg D. Mic-RAS: novel intensive recirculating aquaculture system integrating a photo-membrane-bioreactor. Aquaculture Europe, Copenhagen, Denmark, 2024.
- Moshkovitz, M., Siboni, Y., Ronen, A., Khozin-Goldberg, I., Zilberg D. Mic-RAS: A photo membrane bioreactor-based recirculating aquaculture system where fish waste becomes a product. IAAS-IOLR Aquatic Sciences Joint Meeting, December 2024, Eilat, Israel

Future: Plans applied to BARD 2025 and NIFA-BARD 2025, based on project results.

Project started: Sep 2022 Project ended: Oct 2024 Funds invested: 100,000

✓ **AI for Childhood Risk and Resilience** (Talia M. Schwartz Tayri, Avner Ronen and Tarin Paz-Kagan): A national, encrypted database covering 1.7 million individuals over 30 years is now set and provides predictive models of childhood adversity using machine learning. This research reshapes our understanding of and approach to addressing health and social vulnerabilities across diverse populations.

Presentation at a conference:

- Preliminary findings presented at DARE Conference, Switzerland, 2024.

Publication:

- Submitted to Pediatrics: 'Unveiling Childhood Adversity: Data Linkage Insights'.

Project started: Nov 2023 Ongoing project Funds invested: 50,000

✓ **Climate-Resilient Agriculture** (Shimon Rachmilevitch, Rafi Grosglick and Moriah Ellan)**:** Sweet potato trials under drought conditions address food security strategies in arid zones. The research was recognized at an international agricultural conference, and two publications are now under consideration.

Presentations at conferences:

- International Society of Root Research 12th Symposium, Leipzig, Germany, June 2024.
- Presentation: The 34th Prof. Michael Evenari Symposium, Sde Boker, Israel, May 2024.

Invited talk: Israeli Agriculture Meeting, September 2025.

Publication:

- Isaaca *et al*. 'Effects of water limitation on yield of drip and sprinkler irrigated sweet potato. Irrigation Science, In Review.

Project started: Nov 2023 Project ended: Oct 2024 Funds invested: 50,000

✓ **Wastewater-Based Mental Health Epidemiology** (Ariel Kushmaro, Florina Uzefovsky and Karina Golberg): A BGU-FOR-funded team developed an integrated method for tracking community mental health by monitoring stress hormones and behavioral biomarkers in wastewater. These insights are planned as a tool to direct mental health support to communities in need.

Publication:

- Submitted to *Science*: 'One Health Perspective of Population Under Stress'.

Project started: Nov 2023 Project ended: Oct 2024 Funds invested: 50,000

✓ **Unveiling the Impact of Living Environments on Infectious Disease Risk** (Hadas Hawlena and Jacob Moran-Gilad): A BGU-FOR-funded team focuses on the study of rodents in Southern Israel as reservoirs for Rickettsiae, Coxiella, and Leptospira pathogens, hosts for fleas and ticks, and potential spreaders of AMR.

Project started: Jan 2025 Ongoing project Funds invested: 50,000

✓ **One Health from Afar: Special and Remote Sensing for One Health** (Shimrit Maman, Carmit Cohen, Dorit Nitzan):

Publication:

- In peer-reviewed process for publication: 'One Health from Afar: Lessons learned from applications in Israel'.

Presentation at a conference:

✓ GIFTS 2025 under ISPRS – Category: Emerging Trends in Remote Sensing and Geospatial Technologies for Sustainability.

Project started: Nov 2024 Ongoing project Funds invested in conference: 15,000

✓ **Designing an Israeli Food Traceability List for One Health, Nutritional Security and Risk Analysis – The Israeli Food Traceability List (IFTL)** (Moran Koren, Nimrod Talmor, Dorit Nizan):

Funded by the Israeli Ministry of Science and Technology (MOST) for 3-year duration, from 2024, a total of 749,593 ILS: The study utilizes blockchain Technology for dynamically tracing, tracking, and ranking food items. Our findings will be used to develop a National Food and Nutrition

Security, One Health, and Resilience Action Plan. This plan will assist and encourage individuals and households to make more informed and sustainable food choices. The plan will also inform necessary policy actions to enhance agricultural productivity and practices, natural resources management, international competitiveness, and food quality and health.

Project started: Nov 2023 **Ongoing project** **Funds source: MOST**

- ✓ **Hedgehog-Inspired Biomimetic Sensors** (proposal ready and waiting for funding: Lena Novak, Carmit Cohen, Dorit Nitzan):
  Hedgehog spines, which accumulate environmental toxins, inspired our development of bio-mimicking sensors to detect contamination and its impact on children's health and DNA fragility. This initiative is ready to be implemented with Soroka Medical Center. It bridges One Health science with advanced biotechnology, targeting maternal and child health.

Project started: in preparation **Funds requested**

National and international networks are established

Academic partnerships

- **Yale University**: Prof Steve Schiff (Harvey and Kate Cushing Professor of Neurosurgery, Vice Chair for Global Health, Department of Neurosurgery, Professor of Epidemiology, Department of Epidemiology of Microbial Diseases) asked for BGU-FOR core team to support his efforts to identify the source, using the FOR approach, for the transmission of Paenibacillus thaiminolyticus which is the suspected cause of neonatal brain infections that lead to hydrocephalus in Uganda. A mission is planned to Uganda with the team.
- **Arizona State University:** Prof Randy Burd, Academic Executive at the Office of University Provost, is working with the BGU-FOR core team on solutions-based research initiatives. A proposal is being drafted to focus on the climate impact and learned strategies to protect the FOR system- learning from indigenous populations in Arizona, USA, and the Negev, Israel.
- **Drexel University:** Prof Jonathan Deutsch, Department of Food and Hospitality Management, is collaborating with the BGU FoodLab and BGU-FOR teams on strategies and practices for fostering a healthier relationship with food. Our team brings the One Health Circular Approach to the table. We are looking into funding a sustainable program in BGU.
- **TKC (Teaching Kitchen Collaborative)**: BGU-FOR, through the BGU FOOD LAB initiative, School of Public Health, has become a member of the TKC (Teaching Kitchen Collaborative). TKC is a network of thought-leading organizations that leverage teaching kitchen facilities to enhance public and planetary health. The members span medical, community, school, and corporate settings, and are united by a shared question: What can we achieve together that we cannot accomplish on our own? We are working jointly on initiatives to support translational research and bring culinary health into BGU, through BGU-FOR.
- **Kumaraguru College of Technology, Coimbatore, India**: BGU-FOR core team is linked with the college leadership and the BGU President. We are invited to deliver the plenary and participate in round table discussions in the One Health Symposium that will be held there in October 2025. MOU with the university and BGU will set the stage to foster student exchanges and promote research initiatives that address global FOR challenges.

Philanthropy

- The Jewish Federations of North America and Canada – a proposal focusing on community engagement and resilience using the FOR perspective is discussed with the eastern Negev local authorities and the Federations. The funds will be provided to BGU-FOR to implement the monitoring and evaluation of the initiative.

- Haogen: an initiative is in its first steps, aiming to establish long-term cohort studies on displaced populations in Israel after October 7, 2023. Haogen Group carries out fundraising activities. BGU-FOR is a partner to the translational research arm in this endeavor.

Research funds

- 749,593 ILS from Israel's Ministry of Science, Technology and Innovation for the national Food Traceability study.
- Application to the Mauerberger Family Foundation (MFF) to implement the MEFORSIGHT Regional Health as a Bridge for Peace Initiative. The innitative is aimed at creating a Middle East and partners expert network to deliver joint One Health actions, enhance digital connectivity in routine and crises, and drive health diplomacy (USD 100,000 proposal was submitted to the MFF).
- Two grant applications are being prepared by the BGU-FOR team (Carmit and Dorit), with experts from multiple disciplines, for the Israeli Ministry of Science and Technology and BSF upcoming funds.

BGU-FOR as a recognized entity and a convener

- International conference "One Health from Afar" 2024: Attracted interest from space and remote sensing teams, with whom we prepare applications for grants and foundations.
- Five workshops (1) Ben-Gurion researcher retreat, that produced three multidisciplinary grant proposals; 2) From research to policy – Joint workshop with ministry of Environment; 3) Joint universities VATAT workshop; 4) Connecting the future of marine research, energy innovation, climate change and One Health with centres joint call production; 5) Fluid frontiers: Advancing Water Research within the One Health Framework) – Teams are currently working on cross-disciplinary, translational research proposals.
- Support to FOR research in BGU- the research groups continue investigating and are preparing further research publications.
- Support national and non-governmental committees dealing with health and the FOR dimensions.

Potential policy and translation

- Nutrition & Food Security: The Omega 3 aquaculture pilot offers a climate-smart protein source that is addressing increased sustainable protein demands
- Child & Social Protection: The Ministries of Welfare and Health are discussing an AI-based adversity index for early warning dashboards.
- Mental Health Surveillance: Wastewater biomarker toolkit requested by two municipal health departments.

The Road Ahead—Why Your Continued Support is Critical

Strategic Priorities for 2026–2027

- Launch a standing BGU-FOR Fellowship and Research Grants: Three more calls for research proposals focusing on innovative and relevant FOR interests – AI; Space and Remote sensing; and Water-based challenges. Extended support for ongoing projects, subject to applicability, innovation and sustainability **450,000**
- Inspire a generation of One Health leaders by supporting interdisciplinary student-led projects and postdoctoral fellowships, **100,000**
- Develop a FOR Bio-Inspired Monitoring Tools: Advance biomimetic sensor development for environmental pollutants to safeguard women's and children's health—linking biotechnology, ecology, and public health. **30,000** for preliminary studies
- Connect with and to global standing and strategic networks **20,000**

- Translate research into policy and practice by disseminating findings in high-impact forums, including international publications, public briefings, and strategic policy dialogues. **10,000**
- BGU-FOR Management, coordination, and administration **180,000**
- The next Steering Committee meeting will be held in September 2025.

Investing in BGU: The Next Leap Forward

The BGU-FOR Center is now more than a research hub. It has positioned itself as a network of scientists, experts, policymakers and doers collaborating to integrate science-driven solutions to complex problems.

With the continued support of the Manya Igel Foundation, advancements can be transferred from laboratory benches and field research to practical applications, interdisciplinary teams will continue addressing new scientific challenges, and communities may benefit from equitable and sustainable innovations.

We will continue to search for research opportunities to develop new tools, explore mechanisms, and innovative approaches for sustainable funding of the BGU-FOR.

We are grateful for your investment.