

Personal Information

Name: Bar Cohen

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Education

2023 – Present

MSc in Biology, Weizmann Institute of Science

Focus: Computational biology, genetics, and large-scale genomic data analysis.

2020 – 2023

BSc in Biotechnology, Agroecology, and Plant Health, Hebrew University of Jerusalem

GPA: 90. Focus on molecular biology, genetic engineering, and computational analysis of biological systems.

Research Experience and Employment

2023 – Present

MSc Student in Biology, Pilpel Lab, Weizmann Institute of Science

Conducting research in computational biology and population genetics under the supervision of Prof. Tzachi Pilpel. My work combines biological inquiry with high-performance computing and large-scale data science, leveraging big genomic datasets to address fundamental questions in evolutionary biology and human genetics.

- **Population Genetics & Genomic Cohorts:** Modeling mating patterns and population structure using large-scale genomic data (e.g., UK Biobank). Built and optimized pipelines to detect non-random mating behaviors and subtle stratification signals. Work involves critical literature review, integration of advanced methodologies, and extensive use of cloud (e.g., AWS) and HPC environments.
- **Computational Expertise:** Proficient in Python, Bash, R, SQL, and C. Skilled in UNIX/Linux systems and pipeline development. Routinely optimize code for parallel execution, reproducibility, and memory efficiency.
- **Machine Learning for Biological Data:** Designed ML pipelines for multi-omics and clinical data analysis, including model training, evaluation, and biological interpretation.
- **Metagenomics & Microbial Genomics:** Led a metagenomic project reconstructing and characterizing novel bacterial genomes from environmental samples using advanced assembly and binning methods.
- **Carbon Fixation Analytics Platform:** Developed a real-time, interactive web application to analyze carbon fixation trends in plant systems, enabling broader insights in high-dimensional plant-environment interactions.

2024 – Present

QA Developer, Medical Student Training Program, Weizmann Institute of Science

In parallel with my MSc studies, I work as a QA developer supporting the Medical Student Training Program. I validate and improve computational exercises used in core medical education, ensuring logical flow, contextual accuracy, and technical stability.

- Diagnose and troubleshoot hardware, software, and memory issues in educational platforms.
- Maintain and configure computing environments for consistent student experience.
- Apply bioinformatics knowledge and coding logic to ensure scientific and pedagogical integrity.

2023 – Volunteer – Emergency Tech Infrastructure Team, Israel

Volunteered during the outbreak of war in Israel as part of a national initiative led by Sivan Goltzman. Helped design and manage a system for recruiting volunteers into critical services across the country, developing and maintaining the messaging infrastructure using open-source tools to ensure reliability and scale.

2022–2023 – Research Assistant, Dr. Einat Segev's Lab, Weizmann Institute of Science

Started as a lab technician supporting multiple projects, later awarded an independent research project. Focused on characterizing extracellular proteins involved in microbial biofilms formed by algae and bacteria. Designed and implemented experimental protocols for biofilm generation, protein extraction, and proteomic analysis. This project was part of a collaborative effort with Prof. Irit Sagi's lab to define the molecular composition of these biofilms.

Teaching Experience

2021–2023 – Science and Math Educator

Taught math and chemistry to high school students (grades 11–12) as part of a scholarship-based mentoring program. Also provided private tutoring in math, English, and genetics to both high school and university students.

Publications

Khoury D., Aharon-Hefetz N., Cohen B., Dahan O., Pilpel Y.

"Inheritance of expression noise and revealing novel patterns of quantitative inheritance upon sexual mating."

Pilpel Lab, Weizmann Institute of Science.

Co-author. Led the machine learning analysis and computational validation, revealing patterns of gene expression inheritance and noise in yeast following sexual mating.

Golomb R., Yoles M.^, Fishilevich S.^, Cohen B., Savariego S., Dahary D., Pilpel Y.*

"An information content principle explains regulatory patterns of gene expression across human body tissues."

Department of Molecular Genetics, Weizmann Institute of Science, Israel.

Co-author. Contributed to computational modeling and validation supporting a new framework for understanding tissue-specific gene regulation.

[^]Equal contribution. *Corresponding author.

Carbofixation Mapping Across Weizmann (in preparation/submitted)

Co-author on an institute-wide project mapping carbon fixation activity across diverse biological systems. Contributed early in the project to computational design, SQL db build ,data integration, and web-based visualization tools.

Abada A., Beiralas R., Cohen B., et al. (2022)

"Aerobic marine bacteria contribute to nitric oxide production and drive algal population collapse."

ISME Journal.

Co-author. Generated multiple mutant bacterial strains that supported the study's exploration of bacteria-algae interactions and nitric oxide's ecological role.