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Israel Innovation Authority

Ministry of Innovation, Science & Technology

DDR&D From Vision To Mission

המועצה להשכלה גבוהה
COUNCIL FOR HIGHER EDUCATION
הועדה לתכנון ולתקצוב
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MINISTRY OF HEALTH
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# National Bioconvergence Program

# Activity Summary
# Midterm Report

# National Bioconvergence Program – Activity Summary – Midterm Report

## Executive Summary

The National Bioconvergence (BC) Program aims to establish the bioconvergence field as a central driver of economic growth in the Israeli economy, leveraging Israel's relative advantages in life sciences, engineering, and computational technologies. The program was developed following an extensive staff study by the Israel Innovation Authority and based on the recommendations of the Carmi Committee, which concluded that dedicated government intervention is required to remove barriers and build a competitive, multidisciplinary ecosystem with global leadership.

The first phase of the program, approved by the TELEM Forum and anchored in Government Resolution No. 173, is being implemented from 2023 to 2027 with a budget of approximately NIS 548.5 million, in partnership of the Israel Innovation Authority, the Planning and Budgeting Committee (VATAT), the Directorate of Defence Research & Development (Maf'at), the Ministry of Innovation, Science and Technology (MIST), the Ministry of Health (MOH), and the Ministry of Finance (MOF). The program focuses on four main pillars: developing bioconvergence R&D infrastructure, promoting research excellence, cultivating human capital, and advancing supportive innovative regulation.

Between 2022 and 2025, advanced national R&D infrastructures were established and funded, seven multidisciplinary research and development consortia were active, extensive resources were invested in the incubation and growth of bioconvergence companies, and groundbreaking regulatory initiatives were promoted in the health and food sectors. In parallel, the Israel Innovation Authority supported complementary activities outside the TELEM program framework, with cumulative funding of approximately NIS 348 million, strengthening the innovation continuum from research to commercialization. The report also reviews the contributions of the partner bodies—including the VATAT, Maf'at, MIST, and MOH—through dedicated investments and professional activities in human capital development, research infrastructure, and enabling regulation.

The report presents an updated mapping of Israel's bioconvergence ecosystem, comprising 188 companies operating across diverse application areas—medicine, food, agriculture, industry, environment, and energy—illustrating the field's expansion beyond health applications. In addition, the report highlights Israel's international engagement in the bioconvergence arena.

# Introduction

At the **Israel Innovation Authority Council** meeting held in July 2019, a comprehensive staff study was presented, mapping the strengths and barriers of the biology/life sciences industry, particularly the HealthTech sector in Israel. The study examined global trends, identified opportunities for Israel, and proposed a program to develop an innovative, growing, and globally leading HealthTech industry based on Bioconvergence (BC), aiming to maintain Israel's technological superiority and establish a new engine of growth for the Israeli economy, primarily leveraging the tools of the Israel Innovation Authority.

Although the study initially focused on BC in the health domain, it noted that BC can shape additional industries and sectors, such as agriculture, energy, and security. Therefore, investments in BC are expected to significantly impact the development of growth engines beyond healthcare. The Israel Innovation Authority Council approved the vision and guiding principles of the program at this meeting.

In September 2020, the Israel Innovation Authority recommended to the **TELEM Forum** the development of a long-term national program to advance BC in Israel. In December 2020, the Forum appointed an external committee, led by Prof. Rivka Carmi, to examine and design such a program. After one year, in December 2021, the committee completed its work and submitted its conclusions.

The main conclusion of the **Carmi Committee** was that the Israeli government should intervene at this stage to create a new economic growth engine based on an innovative BC ecosystem, providing competitive advantages to Israeli industry, academic excellence, and global leadership, thereby fostering economic growth and utilizing high-quality human capital that had not yet been fully leveraged economically.

To establish BC as a central economic growth driver, the report concluded that market failures must be addressed and barriers identified by the committee removed.

Following a detailed review, the Carmi Committee recommended five government intervention pillars:

1. Development of interdisciplinary **R&D infrastructures** – establishing infrastructure centers in academia, industry, and defense.
2. Promotion of BC interdisciplinary **research excellence** – grants for basic research, academia-industry bridging, consortia, and dual-challenge programs.
3. Development of multidisciplinary **human capital** – training programs, placements, funding for R&D groups, integration of physicians into industry.
4. Supportive and enabling innovative **regulation** – advisory and guidance tracks for BC technologies.

The committee also recommended that the overall program span approximately a decade, with objectives for the second phase to be updated based on the achievements of the first phase.

In April 2022, the TELEM Forum approved the first phase of the program to advance BC in Israel between 2023–2027, in collaboration with multiple government bodies. Government Resolution No. 173, dated February 24, 2023, formalized the Israel Innovation Authority, VATAT, Maf'at, MIST, and MOF's agreement to participate in financing the National BC Program for 2023–2027.

The total approved budget for the first phase is NIS 548.5 million. In addition to this budget, partner bodies contribute significant ongoing budgets at their discretion.

## First Phase Budget Components

- Development of multidisciplinary R&D **infrastructures** (NIS 274.5 million): Establishment of BC infrastructure, support for institutional equipment acquisition, and support for infrastructures integrating biology with engineering. Partners: Israel Innovation Authority, Maf'at, VATAT.
- Promotion of multidisciplinary **research excellence** (NIS 203.5 million): Establishment of multidisciplinary consortia, groundbreaking applied research,

and dual BC challenges programs. Partners: Israel Innovation Authority, MIST, Maf'at.

- Development of multidisciplinary **human capital** (NIS 60.5 million): Programs for applied training and placement of biologists and engineers, academic BIO training program for the IDF, doctoral and postdoctoral scholarships. Partners: Israel Innovation Authority, Maf'at, VATAT.
- Innovative, supportive, and enabling **regulation** (NIS 5 million): Pilot regulatory advisory track for BC technologies.
- Program **management** (NIS 5 million): Managed by the Israel Innovation Authority with partner financing.

The budget is distributed among participating bodies. Alongside various independent activities conducted by the Israel Innovation Authority, the Authority also consolidates the routine management of the National BC Program via the Program Director, Dr. Shai Melcer.

A scientific advisory council was also established, composed of leading figures from across the BC ecosystem, to guide the program.

## Performance Indicators Approved by the Program's Scientific Advisory Council

**Research:** Volume of applied research in academia (articles, patents, research grants)

**Human Capital:** Integration of life sciences graduates into industry; effectiveness of training and placement programs

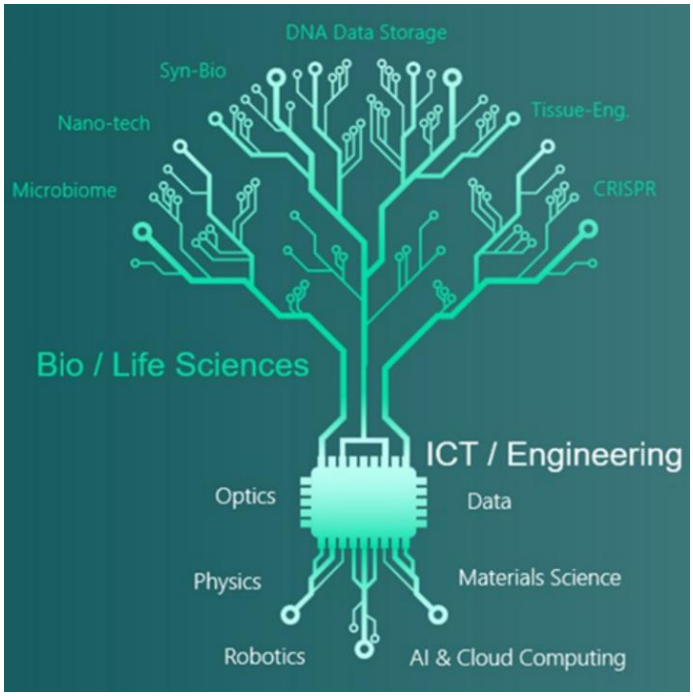
**Infrastructure:** Number and quality of new infrastructures in academia and industry; utilization of existing infrastructures

**Regulation:** Efficient and high-quality regulatory response in Israel to BC companies' needs

## Definition and Classification of a Bioconvergence Project

A project is classified as a bioconvergence project if its R&D activities rely on the integration of **at least two different technological disciplines**, one of which is biology, requiring **deep biological knowledge** as a central component of development. This activity necessitates close collaboration between biology **experts** and experts from at least one other discipline, with each contributing substantially to the design and implementation of the solution. Only when all these integration criteria are met the project is classified as bioconvergence.

For preliminary classification, Israel Innovation Authority application forms include a dedicated questionnaire, reviewed and verified by a professional team. In parallel, bioconvergence activities of companies and researchers outside the Israel Innovation Authority framework are also evaluated as part of a broad mapping of the field in Israel.

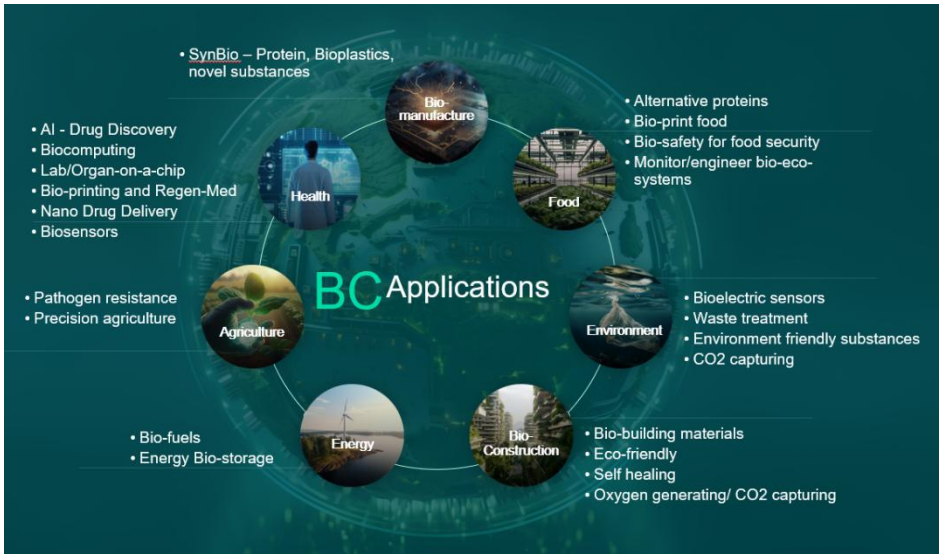


## Bioconvergence Beyond Healthcare

During the program's activity, it became evident that bioconvergence applications span numerous fields, often with technological overlap with healthcare, including environment, agriculture, manufacturing, energy, and food. Examples of BC technologies with diverse applications:

- Innovative computational platforms and AI for analyzing biological data (multi-omics) and designing biological molecules, proteins, antibodies, chemical molecules, and nucleotides – applications in medicine, agriculture, and more.
- 3D bioprinting – applications in medicine, food, agriculture.
- Biochips (organoids, sensing, controlled release) – applications in medicine, agriculture, environment.
- Biocomputing – storage and computation using or inspired by biological components like DNA.
- Devices for harvesting energy from biological sources – applications in energy and environment.

Accordingly, numerous activities were conducted to diversify BC engagement beyond healthcare, under the guidance of program partners (e.g., by steering calls for proposals for applied research), including internal Israel Innovation Authority research and tools.



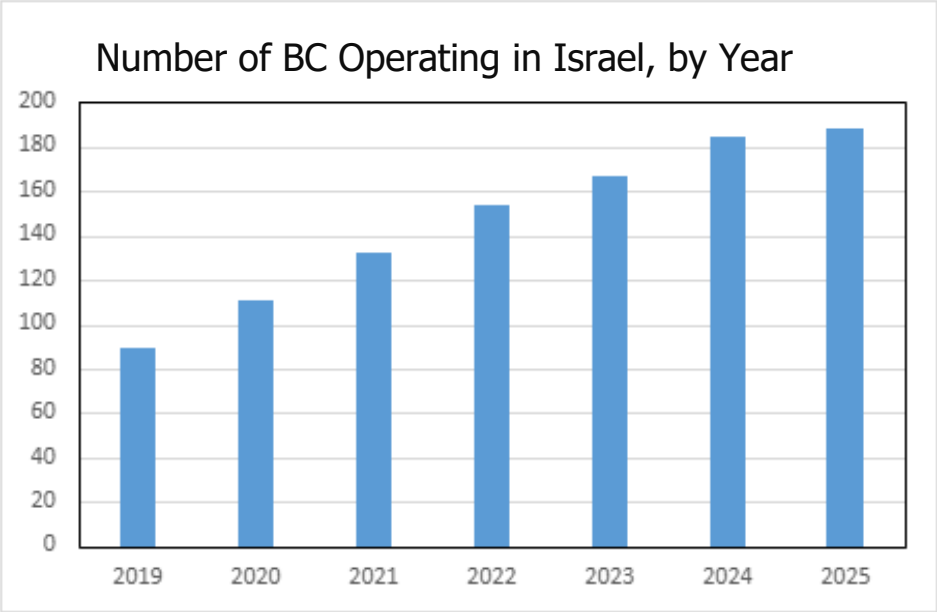
## Mapping BC Companies in Israel

Over the past three years, BC companies in Israel have been systematically tracked and mapped. As of October 2025, the database includes **188 companies** active across different BC application areas. Company distribution by product application area:

| | |
|---|---|
| Medicine & Health | 95 |
| Food | 40 |
| Agriculture | 22 |
| Industry | 21 |
| Environment & Energy | 8 |
| Lifestyle | 2 |

Overall, 188 companies operating in BC-related fields were mapped during this period.

The number of BC companies in Israel between 2019–2025 shows continuous growth over the years.



# Performance Report of the National Bioconvergence Program 2022–2025

## 1. Development of Multidisciplinary BC R&D Infrastructures

### 1.1 Infrastructure for Bio-Devices

In December 2024, the consortium of Israel Aerospace Industries and Beckermus Technologies won the tender for establishing a leading R&D infrastructure for chip-based bio-devices. This center is intended to house dedicated equipment and multidisciplinary personnel to provide R&D services to Israeli corporations and/or research institutions, supporting all stages of research, development, design, prototype production, validation, and more. The infrastructure is budgeted at up to 113 million NIS, of which 75 million NIS will be invested by the Israel Innovation Authority. The infrastructure is currently under construction.

Prof. Ben Maoz Lab, Tel Aviv University

### 1.2 Multi-Omics Infrastructure

The Multi-Omics Center was established in 2025 and serves as Israel's first research platform dedicated to the integrative combination of genomics, transcriptomics, proteomics, metabolomics, lipidomics, microbiome, and other omics fields. Located at the Technion, the center represents a unique collaboration with Ben-Gurion University and the University of Haifa and is supported by VATAT with 15 million NIS. This collaboration enables the consolidation of expertise, infrastructure, and technologies under one roof, providing comprehensive and unique services to academia and industry.

The center operates as a one-stop shop for multi-omics research, offering personalized support throughout the research process—from defining scientific questions and experimental design, through guidance on sample preparation from a wide range of biological systems, to performing advanced analyses and bioinformatic integration to generate a comprehensive systems-level view.

The center's vision is to lead the field of multi-omics in Israel, implement advanced research methodologies and AI-based information systems, and train the next generation of scientists in multi-omics.

### 1.3 High-Value Equipment for Academic Research

During 2023–2024, VATAT funded a total of 47 million NIS for the acquisition of high-value research equipment. This included a variety of instruments—microscopy, molecular analysis tools, and more—serving dozens of research groups across Israeli institutions. Equipment requests were approved through a general competitive process (without defining specific research areas). The information regarding the acquisition was reviewed by the National Program Director, together with VATAT representatives, identified items whose research purposes were inherently bioconvergence-related.

## BC Infrastructures Funded Outside the National Program's Dedicated Budget

### 1.4 Microorganism Fermentation Infrastructure

YDLabs, located in the Tziporit industrial area, received a three-year Israel Innovation Authority budget to establish a fermentation infrastructure for food and agriculture. Services range from pilot scale to small-scale production and must comply with relevant standards. Through this three-year program, YDLabs built technological and operational infrastructure to provide fermentation services, process development, and scale-up to 15,000 liters per batch, with a cumulative capacity of approximately 24,000 liters. The company ended 2024 with revenues of 3 million NIS, triple that of 2023. Over the last year, YDLabs expanded its professional and technological workforce, mostly from the Galilee, tripling staff to 30 employees, most on the production floor. Despite the war, the company continued growth and expanded its client base to new areas, including fiber industry, agriculture, and even defense solutions. Gadot Group contributed 75% of the investment and supports the company in various areas.

### 1.5 R&D Services of 3D Biological Models for Cancer Research

In June 2024, Alvox Bio received Israel Innovation Authority funding to establish an R&D infrastructure providing services in 3D biological models used for drug development and cancer research. The infrastructure includes implementation of equipment and methods for printing 3D tissue models derived from cancer tumors and methods for characterizing and testing model functionality in drug efficacy and safety studies. The company plans to expand its services to include advanced high-throughput analyses for large-scale drug and treatment screening tailored to patients and tumor types, expanding its potential client base from biotech researchers to pharmaceutical companies and treating physicians.

### 1.6 R&D Services in Synthetic Biology

Alagene is a biotechnology innovation company (Biofoundry CRO) specializing in various stages of development, enabling rapid and efficient transition from ideas to practical solutions. The company's vision is to be a central partner for biotech companies, startups, and industry—from concept to commercial product. Alagene offers end-to-end services based on four main modules:

1. Cell Engineering – Advanced genetic design to develop strains tailored for diverse applications.
2. High-Throughput Screening and Automation – Methods for precise, rapid, and high-resolution identification, characterization, and testing of biomaterials.
3. Upstream Processing – Precise fermentation and biomass growth, along with techno-economic modeling for production processes.
4. Downstream Processing and Analysis – Purification of biomolecules and development of analytical methods to produce functional and stable outputs.

To accelerate development and translate innovation into practice, Alagene integrates synthetic biology, process engineering, advanced analytics, and automation. This allows efficient, reliable, and sustainable production of proteins and biomolecules. Israel Innovation Authority investment enabled Alagene to establish and expand

physical and technological infrastructure, develop innovative platforms, and integrate projects with academia, startups, and industry.

## 2. Israel Innovation Authority's Dedicated Activities to Nurture BC Companies

### 2.1 BC Company Incubation in Technology Hubs

Between 2022–2025, Israel Innovation Authority invested in 28 bioconvergence-classified projects via its technology incubator track. These projects were distributed across various technology incubators in multiple sectors, reflecting the multidisciplinary nature of BC and its penetration into Israel's entrepreneurial ecosystems.

Most activity focused on healthcare, alongside projects in food, environment, industry, and cross-disciplinary applications. Over the years, a clear deepening trend emerged: initial years saw increasing numbers of new applications, followed by continued support and investment in existing projects, reflecting sector maturation and companies' progress in development stages.

### 2.2 AION Labs – Innovation Lab Supported by Israel Innovation Authority

AION Labs is Israel's first innovation lab established through collaboration among four major pharma companies—AstraZeneca, Merck, Pfizer, Teva—together with the Israeli Biotech Fund (IBF), Amiti Ventures, Amazon Web Services (AWS), and BioMed X. All partners have joined forces, with the support of the Israel Innovation Authority, to develop and adopt cutting-edge AI technologies that will transform the drug discovery process and the development of innovative medical treatments.

Eight companies, founded between November 2023 and February 2025, operate within the lab, bridging pharma industry needs with advanced AI capabilities. These companies develop technologies enabling fast and precise drug discovery, including for protein targets difficult to detect using classical methods, reducing experimental cycles and deepening biological understanding. Examples include: DenovAI and CombinAble – therapeutic antibodies; TenAces – molecular "glue"; Promise Bio –

protein change mapping; Cassidy Bio – gene editing optimization; Pro-Phet – small molecule identification; Cellyrix – tackling cancer resistance; Renasis Bio – RNA target detection. Some of these companies have already raised millions of dollars and collaborate with leading researchers and pharma companies.

## Summary of Israel Innovation Authority Support for Bioconvergence Entrepreneurs and Companies 2022–2025 (Outside TELEM Program)

From 2022–2025, Israel Innovation Authority provided broad support for BC entrepreneurs, companies, and R&D infrastructures across all maturity stages—from early-stage incubation to growth and expansion. Support was provided through multiple Israel Innovation Authority tracks, excluding activities under the TELEM program.

During this period, grants totaling approximately 348 million NIS were approved for R&D activities, including establishment of industry-dedicated R&D infrastructures; support for dozens of early-stage ventures through incubators, Tnufa track, and innovation labs; and significant investments in growth-stage companies.

| | 2022 | | 2023 | | 2024 | | 2025 (3 quarters) | |
|---|---|---|---|---|---|---|---|---|
| **Division** | **Approved Requests** | **Total Grant** | **Approved Requests** | **Total Grant** | **Approved Requests** | **Total Grant** | **Approved Requests** | **Total Grant** |
| Industrial R&D Infrastructure | 0 | 0 | 0 | 0 | 2 | 20,828,606 | 1 | 6,070,514 |
| Early Stage | 12 | 25,644,738 | 28 | 36,366,165 | 17 | 26,756,658 | 12 | 15,172,639 |
| Growth | 16 | 29,246,175 | 25 | 67,159,093 | 16 | 53,795,206 | 19 | 67,072,303 |
| **Total** | **28** | **54,890,913** | **53** | **103,525,258** | **35** | **101,380,470** | **32** | **88,315,456** |

# 3. Promoting Excellence in Multidisciplinary BC Research

## 3.1 R&D Consortia Supported by the Israel Innovation Authority

Between 2022–2025, seven consortia operated with support from the Israel Innovation Authority, with substantial portions of their activities demonstrating BC. A total of 203 million NIS in grants were invested in these consortia during 2022–2025. The following provides a detailed overview of the supported consortia activities:

### 3.1.1 CRISPRIL Consortium

The CRISPRIL consortium operated from April 2020 to June 2023 with a total budget of approximately 87 million NIS. Its objective was to develop an end-to-end artificial intelligence (AI)-based system to support **genetic editing** in cells and organisms, addressing the current limitations of the technology: lack of standardization, low precision, insufficient efficiency, and safety concerns. Improved editing capabilities would enable rapid and efficient development of innovative products across diverse fields. The consortium included 11 companies and 13 academic groups with expertise in bioinformatics, biotechnology, algorithm and software for genetic therapy, pharmaceuticals, and enhanced agricultural products in plants, insects, and crustaceans. The consortium successfully achieved its targets, with results published in multiple scientific journals, presented in consortium workshops, and at a conference held at the Weizmann Institute. Additionally, the consortium worked extensively to advance the ecosystem and remove industry barriers through engagement with U.S. regulatory bodies and Israel's Ministries of Health and Agriculture.

### 3.1.2 IGBTC Bio-Chip Technologies Consortium

The IGBTC Bio-Chip consortium operated from October 2021 to June 2025, aiming to develop technological building blocks bridging gaps in Israel's bio-chip sector. The consortium included 8 industrial companies and 13 leading academic groups. Advanced sensors were developed across multiple types: acoustic, biochemical, electrochemical, optical, and BioFET, including femtogram-level detection capabilities. The consortium also advanced technologies such as Organ-on-Chip, electrochemical reaction libraries for metabolites, and mRNA-based biomarkers.

Wearable devices were developed, including a mobile analytical lab and precise blood pressure measurement systems. Furthermore, forward-looking technologies were developed, including nanofluidic components, ASIC-based sensors, and innovative electrodes for precise biological monitoring. The consortium strengthened Israel's position in the field and made advanced technologies accessible to local industry.

### 3.1.3 Cultured Meat Consortium

The Cultured Meat consortium operated from June 2022 to May 2025. It was established to address the main techno-economic barriers to scaling up cultured meat production: achieving rapid cell division at high density, developing differentiation characteristics, reducing growth medium costs, and developing alternative bioreactors to those available on the market. Another goal was to establish local production infrastructure for inputs needed by the global cultured meat industry (cell lines, medium components, growth factors, bioreactor systems, and deep academic knowledge). The consortium developed cost-effective production of protein growth factors using synthetic biology in yeast (fermentation) and plants (molecular agriculture), and achieved a breakthrough in developing inexpensive polyphenol salts with biological activity as substitutes for protein growth factors. The consortium demonstrated a scale-out concept using inexpensive single-use bioreactors for growing "whole cuts" on cellulose scaffolds, including engineering of supporting system components for near-full automation, with external monitoring of cultures without medium contact. Additional achievements included the development and application of rapid, advanced analytical methods for cell characterization, development of basal medium free of animal components in powdered form at low cost, and more. The consortium included 11 companies: 2 cultured meat companies, 5 mature companies from the pharma/biotech, food, and engineering sectors, 3 biotech startups, and the Synthetic Biology Institute. They collaborated with 8 academic groups from biology, computational biology, and cell therapy/pharma.

### 3.1.4 LIQUIDBX Liquid Biopsy Consortium

LIQUIDBX has been operating since September 2022 with funding of approximately 35 million NIS, aiming to develop a generic technological infrastructure for liquid

biopsy. The consortium combines microfluidics, sensitive sensors, biomarker detection across multiple omics, and advanced computational tools. Solutions will enable disease diagnosis and monitoring via simple blood sampling at the point of care. The consortium includes 7 startups and 10 academic groups in engineering, medicine, biology, and algorithmics. Achievements include establishing infrastructure for collecting samples from Alzheimer's and cancer patients, developing a computational pipeline for multi-omics data, improving biomarker detection sensitivity, and developing innovative assays for single-molecule detection and biomarker screening. Collaborations with Hadassah, Roche, and Ultima Genomics significantly advanced the consortium's success.

### 3.1.5 OrganoSpheres Consortium

OrganoSpheres launched in September 2024 with a budget of approximately 25 million NIS, aiming to develop a technological and data infrastructure for 3D cell culture systems (organospheres). These structures simulate human tissues and organs, providing a foundation for clinical research, drug discovery, and personalized medicine. The consortium includes 10 companies (6 startups, 2 pharma, 2 CROs) and 5 academic groups from medicine, biology, and computational fields. Within the first six months, effective collaboration among participants was observed. The consortium aims to provide innovative tools for drug R&D while creating shared standards for organoid growth, measurement, and analysis. It serves as a national infrastructure for advancing biological research in Israel.

### 3.1.6 Black Soldier Fly Consortium

The BSF consortium began in January 2023, reflecting Israel's commitment to sustainable circular agriculture. The consortium includes 7 companies and 6 academic groups (University of Haifa, Hebrew University, Technion, Volcani Institute, MIGAL) integrating AI tools and genetic editing of the black soldier fly. Participation in the consortium provided both business and infrastructure support to several of the companies, helping them raise financial resources. The consortium framework also contributed by fostering connections among the participants that would not have occurred otherwise. The consortium has achieved multiple innovations: development of a feeding model using innovative imaging for growth and operational monitoring,

creation of a molecular toolkit based on high-quality genome sequencing including sex characterization, and a marker library enabling colony mapping and collapse prediction. These achievements are unique to the consortium and significantly contribute to participant business activities.

### 3.1.7 Bio+ Consortium

Bio+ began in August 2023 with a budget of approximately 25 million NIS for Phase A. Initially, the consortium included 24 partners (14 industrial, 10 academic). Among the 14 industrial partners were 6 startups (Polygreen, Melodea, Solutum, Algalife, Alagene, Enzymit), with a substantial portion of their planned activities being research-oriented. Four startups withdrew during Phase A for various reasons.

Phase A activities were significantly affected by the war in October 2023, which impacted industries and academic groups, including Kafrit (Kfar Gaza) and two Ben-Gurion University research groups. Consortium members expressed appreciation for Kafrit resuming full participation following a 3-month pause.

The consortium aims to convert short-lifespan plastics into biodegradable materials. This includes products that cannot be collected or recycled, such as hygiene items (diapers, feminine hygiene), agricultural products (nets, mulch films, plant containers), single-use packaging and utensils (food, pharmaceuticals, cosmetics), advertising panels, and geomembranes. Globally, of the 360 million tons of plastic produced annually, 220 million tons (~60%) are short-lived (<1 year), and only 60 million tons are managed (recycled or incinerated for energy), leaving 160 million tons causing environmental harm. Current biodegradable plastics account for <0.4% of the 360 million tons (~1.55 million tons).

Bio+ focuses on two main directions: (1) converting commercial plastics (mainly polyolefins used for short-term single-use products) into biodegradable materials, and (2) improving properties of commercial biodegradable polymers regarding cost, physical properties, processing compatibility, and biodegradability.

### 3.1.8 Summary of Israel Innovation Authority Investments in Consortia

| | 2022 | 2023 | 2024 | 2025 | Total |
|---|---|---|---|---|---|
| BIO CHIP | 1,192,921 | 21,410,827 | 132,908 | - | 22,736,656 |
| Bio+ | - | 10,999,303 | 959,433 | 14,332,201 | 26,290,937 |
| Black Soldier Fly | 29,551,06 | 271,660 | 4,570,567 | 8,232,443 | 42,625,730 |
| LIQUID BIOPSY | 21,036,43 | 4,540,453 | 27,361,044 | - | 52,937,931 |
| Cultivated Meat | 21,250,54 | 18,532,361 | 77,000 | - | 39,859,907 |
| ORGANOSPHERES | - | - | 17,171,378 | 1,350,365 | 18,521,743 |
| CRISPRIL | 228,104 | - | - | - | 228,104 |
| **Total** | **73,259,065** | **55,754,604** | **50,272,330** | **23,915,009** | **203,201,008** |

## 3.2 Promotion of Science and Applied Research

- **Israel Innovation Authority – Support for Applied Research and Knowledge Commercialization**: Between 2022–2025 (3 quarters), 90 applications classified as BC and borderline BC were submitted, focusing on **applied research and knowledge commercialization** in academia and industry. By the end of Q3 2025, 31 R&D programs were funded with grants totaling approximately 36.6 million NIS.
- **Ministry of Innovation, Science, and Technology** promotes applied academic research with research institutions, colleges, hospitals, and research institutes. As a partner in the national BC program, the ministry will invest 80 million NIS in BC research over five years. The ministry issues calls for **proposals for research with applied potential**, some specifically defined in BC, with subtopics coordinated with the program lead and/or relevant Israel Innovation Authority parties. All calls focus on applied science and include the option to submit BC-related research.

  Between 2023–2025, the ministry funded 106 BC research projects totaling 55 million NIS, covering applications such as regenerative medicine, tissue engineering, smart implants, drug design, environmental sensors, and theranostics.

Funding by year:

| Year | Funded Proposals | Budget (NIS) |
|---|---|---|
| **2023** | **28** | **20,225,242** |
| **2024** | **53** | **20,152,703** |
| **2025** | **25** | **14,484,360** |

- **Maf'at** "Challenges" Program: Incubates and develops breakthrough solutions and technologies for dual-use civilian and defense applications. The program aims to build a community of researchers and entrepreneurs developing BC solutions for unmet defense-technological challenges. A budget of 25 million NIS was allocated over five years, with 5 million NIS disbursed in 2025.
- Looking Ahead (from 2026) – **VATAT** Scholarships: VATAT updated its doctoral and postdoctoral **scholarship program** for outstanding students in agriculture, food/nutrition, and biodiversity (2026–2028), adding dedicated tracks for biology/medicine + engineering and computational biology. Doctoral scholarships will total 6.48 million NIS, postdoctoral 5.256 million NIS.
- Applied Research Promotion via VATAT: **VATAT** also supports applied research, including studies related to BC. In 2024, VATAT and the Ministry of Innovation, Science, and Technology launched a joint **Proof-of-Concept (POC) program** to bridge the gap between basic academic research with applied potential and research that can attract commercial or public stakeholders. The POC phase is critical for developing commercially viable projects but faces significant market failures due to uncertainty. The program is open to all academic fields, offering grants up to 350,000 NIS for 18–24 months, based on research excellence, feasibility, commercialization potential, innovation, project originality, and research team quality. In the first cycle, 4 BC proposals were awarded approximately 1.4 million NIS. The second cycle is expected in Q1 2026.

# 4. Development of Multidisciplinary Human Capital

## 4.1 Israel Innovation Authority Support for Human Capital Programs

Between 2022–2025, the Israel Innovation Authority issued three calls for proposals to fund human capital development programs in the BC field. During this period, 11 training and retraining programs in BC were approved, with a total grant volume of 11.7 million NIS. Approximately 1,000 talented participants are expected to benefit from these programs.

The training programs cover a wide range of BC sub-specialties, including:

- Training employees from life sciences backgrounds for the cultured meat industry.
- Learning and training in 3D printing for life sciences graduates and medical doctors.
- Training engineers and programmers from the high-tech industry for hospitals.
- Specialization in the use of medical data, including data analysis tools for life sciences graduates.
- Training in entrepreneurship and project development in BC.
- Removing barriers for graduates of elite units, such as Unit 8200, in establishing BC companies.
- Training in cutting-edge BC regulation in medicine.
- Training CEOs to lead Israeli deep-tech companies with a focus on bioconvergence, bridging engineering and biotech domains.

## 4.2 Maf'at Activities

Maf'at leads bioconvergence activities for the Israeli Defense System through the Biological Engineering Department, established in May 2021. Its activities focus on developing advanced bioengineering capabilities with dual-use civilian and defense applications and integrating them into the defense system and defense industries.

**Key areas include:**

**Dedicated human capital development in BC**
Maf'at initiated and leads the "Bio-Talpiot" training program, aimed at building a multidisciplinary expert reserve for the defense system. To date, three cohorts comprising 21 trainees have completed the program, and a dedicated management unit was established at Maf'at to run the program and support participants. The program's budget is 3.5 million NIS.

**Development of interdisciplinary R&D infrastructure**
Maf'at partners in developing and implementing multidisciplinary R&D infrastructure supporting BC activities. The investment totals approximately 16 million NIS over five years, enabling the creation of a research environment tailored to unique defense requirements.

**Encouraging and funding biological R&D in defense industries**
As part of efforts to expand defense industry involvement in BC, Maf'at funds dedicated biological R&D groups within the defense sector. Funding totals approximately 10 million NIS over five years, aimed at strengthening knowledge, developing internal capabilities, and creating a foundation for innovative dual-use technological solutions.

Through human capital development, R&D infrastructure investment, and defense industry support, Maf'at plays a central role in establishing BC as a strategic component within the Israeli defense system.

## 5. Innovative, Supportive, and Enabling Regulation

### 5.1 Food Regulation

**Regulatory Guide for Novel Foods** – The National Food Service published a comprehensive guide for foodtech companies applying for approval to market innovative products, such as cultured meat and food ingredients produced via precision fermentation. The guide outlines requirements, process structure, and regulatory instructions and is a key output of a pilot jointly conducted with the Ministry of Health, aimed at clarifying rules and reducing barriers in the alternative protein sector. The pilot, initiated by the Israel Innovation Authority and Ministry of Health, included four companies and served as a "sandbox" for learning new food

approval processes. Two companies—Aleph Farms and Remilk—received approval through the pilot, followed by Imagindairy benefiting from the process outcomes.

The pilot's success was enabled by resource investment from the Israel Innovation Authority's Technology Division and regulatory leadership by the Ministry of Health, while fully ensuring food safety. The commercial value is high, and cultured dairy products are now reaching retail shelves.

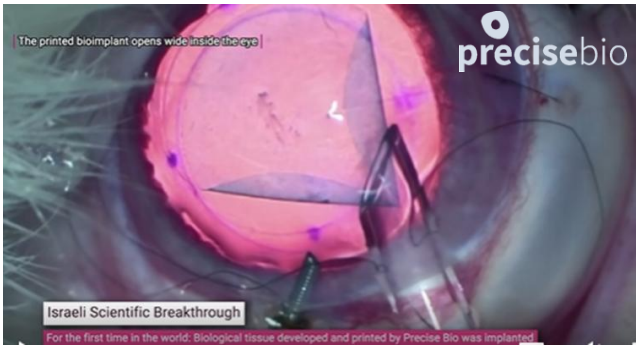
## 5.2 Health Regulation

The Israel Innovation Authority's "Disruptive Ventures" track allows startups to develop, validate, test, and demonstrate disruptive innovations within a unique global regulatory sandbox. This provides BC ventures facing significant regulatory barriers with a competitive advantage through direct engagement with the Israeli regulator.

This program aims to reach a First-in-Human clinical trial within an Israeli healthcare institution, with continuous regulatory guidance from the Ministry of Health. Dedicated positions within the Ministry were allocated to support this process.

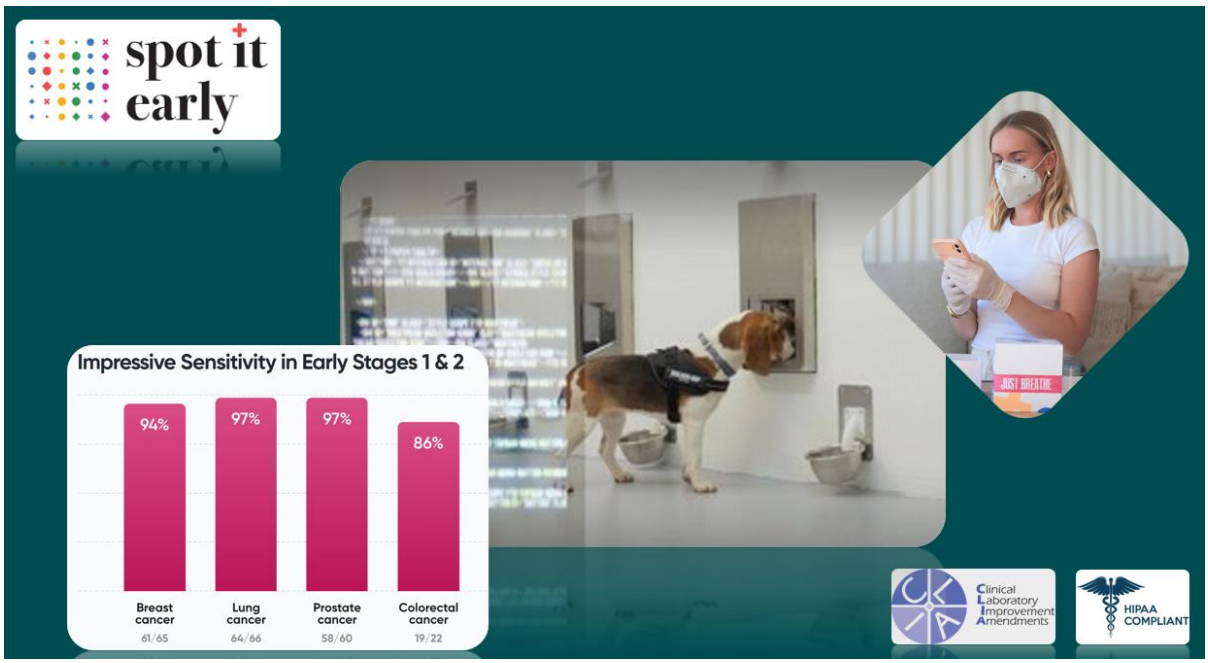
To date, two calls for proposals have been issued, supporting three companies pursuing challenging regulatory pathways. Total grants for these companies reached 20.9 million NIS, with a Ministry of Health contribution of 5 million NIS.

PreciseBio 3D – The company produces human cell-based tissues and natural materials for indications lacking sufficient organ donations or for tissue replacement therapies. Its first product is an engineered cornea containing human endothelial cells and collagen, for implantation in



patients with corneal edema. The cornea is printed on a collagen-support layer. The regulatory challenge arises from the lack of an existing framework for 3D-printed biological products, especially those containing living cells. The company recently achieved the world's first successful 3D-printed cornea transplant in a human clinical trial at Rambam Medical Center in Haifa.

SpotItEarly – This technology leverages dogs' advanced olfactory ability to detect cancer from exhaled breath samples. The company analyzes dog responses via extensive sensor data collection to produce a certainty score for each sample. Because the technology relies on animals as sensors, it **does not fit existing regulatory pathways** and must navigate a regulatory framework unprepared for such products.




Edity Therapeutics – Develops a cell-based system to deliver genetically engineered components that recruit the immune system to attack solid tumors lacking effective treatments. The engineered cells originate from the patient and are reintroduced to deliver therapeutic payloads to tumor cells, prompting immune-mediated tumor targeting. Regulatory challenges arise because no clear pathway exists for immune cell-based delivery systems, requiring the company to work with regulators to establish new standards.

## Program Management

In June 2024, Dr. Shai Melcer was appointed Director of the National Bioconvergence Program, responsible for implementing the program within the TELEM Forum. Dr. Melcer holds BA and MA degrees in Law, a PhD in Genetics from the Hebrew University, and 15 years of experience in biomedical entrepreneurship.

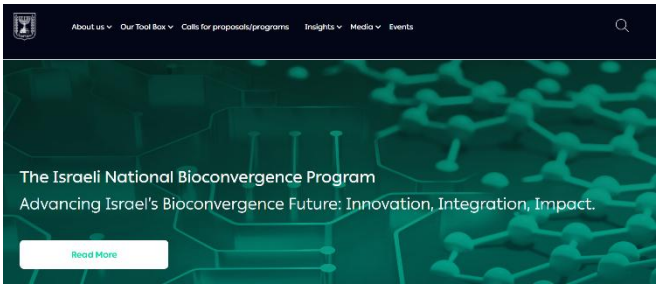
He has collaborated with institutions including the Hebrew University, Hadassah Medical Center, IBM, and Bio-Jerusalem, and co-founded innovative biomedical ventures such as BioGiv, BIOHOUSE, and the Hadassah Accelerator. In both public and private sectors, he has worked with hundreds of bio-medical companies globally in pharma-biotech, medical devices, and digital health, many within bioconvergence. He also served as VP of Business at Minovia, a startup in the Liquid Biopsy consortium established by the Israel Innovation Authority under the Bioconvergence Program.

***"After years of biological research in academia, and years of working with biomedical companies, including engineering and digital firms, bioconvergence is very close to my heart. I have witnessed efforts to develop the field, both in Israel and abroad, and have even participated in some of them, greatly appreciating the focus and resources dedicated to it. I see it as both a privilege and a mission to serve as Program Director and am pleased to be part of a professional team addressing the challenges it presents. Israel is blessed with excellent researchers across the life sciences, as well as top-tier engineers and computational experts, all living and working in an environment that encourages creativity and resourcefulness in R&D. It is our responsibility to realize the tremendous potential inherent in building multidisciplinary teams that create synergistic value in the development of complex technologies. We must cultivate a productive and enabling work environment and advance and support competitive advantages."***

***Dr. Shai Melcer***

## The National BC Program – Online Presence and Media

- In May 2025, the official **website** of Israel's National Bioconvergence Program - bioconvergence.org.il - was launched, with the aim of serving as a central platform for visibility, knowledge sharing, and knowledge management in the field (intended for all program partners).




The website includes, among other things: general information about the program; a centralized "Tool-Box" featuring infrastructures, incubators, innovation hubs, and angel networks; publications of relevant calls for proposals; technology reviews and professional articles; media content such as videos and podcasts; and updates on conferences and events.

The website serves as a significant tool for making program activities accessible to diverse target audiences from academia and industry and is continuously maintained and updated in line with field developments and emerging needs.

- In addition, a **LinkedIn group** was established with hundreds of active members. The group enables sharing, Q&A, and community-building around the National Bioconvergence Program.




https://bioconvergence.org.il/

## Technology Reviews in the BC Field

Ten technology reviews addressing various BC applications were published:

- Bioconvergence – terminology and guiding principles
- Bioconvergence in Israel and globally (2022)
- Biochips
- Artificial Intelligence in the Development of New Drugs
- The Role of Biomanufacturing in Combating Climate Change
- Biochips: Addressing the Challenges of Climate Change
- Engineered Algae
- Biotechnological methods for food production in plants
- Biological Construction: A Possible Response to Climate Change
- Bioconvergence for Combating Desertification Processes

## BC-Related Articles in the Israel Innovation Authority's Digital Magazine

- Bioconvergence – Israel's New Growth Engine: Not science fiction, but the next reality. Bioconvergence as a national program, supported by the Israel Innovation Authority, enabling Israeli companies to lead the next generation of high-tech.
- Molecules of Hope: Two Israeli biomedical companies developing imagination-stirring technologies—one producing miniature human organs for safe, rapid, personalized, and significantly lower-cost drug testing; the other developing patches aimed at preventing and treating diabetes.
- Materials from Another World: Bold bioconvergence-based thinking propels two Israeli companies toward innovative materials—one developing spider-silk-inspired fibers, the "holy grail" of materials science; the other designing and building enzymes as biological nano-machines capable of producing almost any material.

- Innovative Pest Controls for a Better World: 21st-century farmers still fight pests, but with environmental and health considerations in mind. Two Israeli startups integrate engineering, AI, chemistry, biology, and machine learning to reduce chemicals in our food.
- Food for Thought: In a world where traditional production harms the environment and human and animal health, Israeli foodtech is changing reality through integrated technologies—turning visions such as cow-free milk and bee-free honey into reality.
- Green Clean Water: Shopping bags made of algae? Fish grown in the desert? Scientific convergence creates surprising realities through biological polymers from algae and innovative water purification technologies.
- Personalized Proteins: Advances in controlling protein function are reshaping pharmaceuticals, vaccines, and industrial enzymes, enabling rapid stabilization and activation of proteins with global impact.
- Many Diseases Will Disappear in the Future: From miniature biological chips simulating organ physiology to smart nanoparticles and micro-devices for drug delivery—emerging technologies and pattern-recognition research beyond human capability.

## Videos and Podcasts

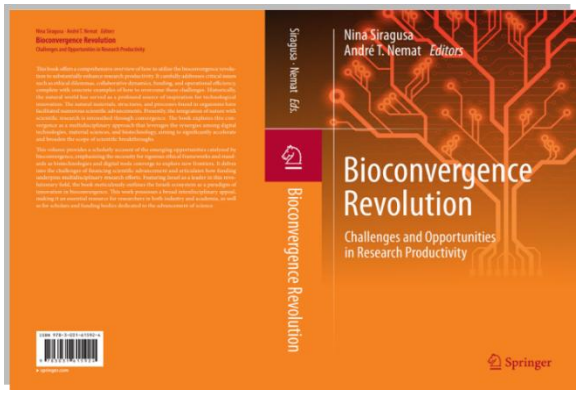
- Alternative Proteins – Interview with Ronit Eshel, the Head of ClimateTech at the Israel Innovation Authority on Israel's global positioning in alternative protein technologies and their health benefits.
- Meet Precise Bio – One-click 3D printing of transplant-ready corneas.
- Redefine Meat – Plant-based materials engineering aiming to retire cattle.
- Seevix Material Sciences – Producing ultra-strong fibers without spiders.
- FORSEA – Cultivating eel for the Japanese food market.
- Interview with Dr. Shai Melcer on establishing Israel's first bio-devices and biochips laboratory.
- Base to Base Biotech by Jim Cornall – Israel's National Bioconvergence Program.
- Progress, Potential & Possibilities podcast with Shai Melcer on Bioconvergence.
- Lecture/Video on BC Regulation with Tel Aviv University, broadcast globally to students.

## Presentation of the National Program at Conferences in Israel and Abroad

- Israeli Cardiology Conference (ICI) – February 2024
- Fraunhofer Bio-Intelligence Conference, Stuttgart – October 2024
- Synthetic Biology Conference, Reichman University – September 2024 & September 2025
- 3D Printing Conference, Soroka Medical Center with Synergy 7, Be'er Sheva – January 2025
- Road2 Innovation Center Conference, Haifa – November 2024
- Biomedical Entrepreneurship and Regulation Conference, RS Ness – December 2024
- HELLO TOMORROW, Paris – March 2025
- MIGAL Institute Conference – September 2024
- ESIL/ENERGYCOM Opening-Year Conference – January 2025
- ANIMAL FREE TECH Koller Competition – March 2025
- Participation in an event with the Ministry of Health in Geneva – WHO Conference, May 2025
- Participation in the BNCT Committee at the OECD – May 2025

## Publication in Professional Literature

In 2024, the book Bioconvergence Revolution was published. The concluding chapter was authored by Zachi Schnarch, Deputy CEO of the Israel Innovation Authority, presenting the background for launching the national program, the Israeli ecosystem, and the activities of the Authority and its partners.




The book's editor, Nina Siragusa, former Chief of Staff to the CEO of Merck and currently a senior executive at Merck, adopted bioconvergence as part of the company's strategy. Israel is featured on the book's cover as a global leader in BC.



https://bioconvergence.org.il/

# BC Activities in Cooperation with the World Economic Forum (WEF)

1. International Report on Alternative Proteins (May 2024)

   "How Israel Is Advancing Alternative Proteins Across Sectors"

   The report was leveraged across multiple international forums:

   - A joint webinar presenting Israel's strategy for advancing alternative proteins – May 2024
   - Launch at the WEF GTR event in San Francisco (May 28–30, 2024), including a side event with stakeholders, country representatives, investors, and NGOs, led by C4IR Israel and GFI Israel

2. Participation of Israeli Companies in the WEF C4IR Israel Innovation Community

   Several BC companies are community partners and contributors, including:

| | |
|---|---|
| Global Innovators | Aleph Farms |
| Tech Pioneers | Enzymit |
| Tech Pioneers | Imagindairy |
| Tech Pioneers | Wanda Fish |
| Unicorns | ImmunAI |

3. Participation in International Professional Communities

   The Israel Innovation Authority actively participates in leading international professional communities in the Bio-Economy and bioconvergence fields, including steering committees, dedicated forums, and working groups addressing regulation and value chains.
   This engagement supports addressing global challenges, sharing Israel's experience, and exposure to emerging international models and tools.
   As part of this activity, the Authority made significant contributions to WEF publications, presenting Israel as a practical example of bio-economy policy implementation:

From_Policy_to_Practice_Actionable_Recommendations_for_a_Commercial_Bioeconomy_2025.pdf

Next_Generation_Bio_Innovation_2025.pdf

4. International Collaboration – Partnership with C4IR Serbia

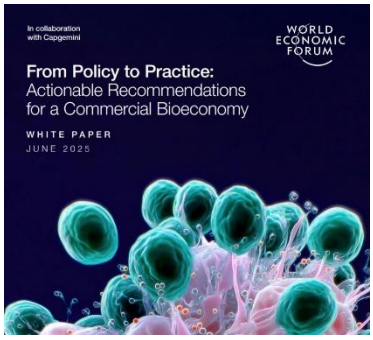
   Following a joint declaration signed between Serbia and Israel in 2024, a strategic partnership was established between C4IR Israel and C4IR Serbia within the global WEF network. This collaboration addresses shared global challenges in health, food security, and climate through bioconvergence and bio-economy innovation.

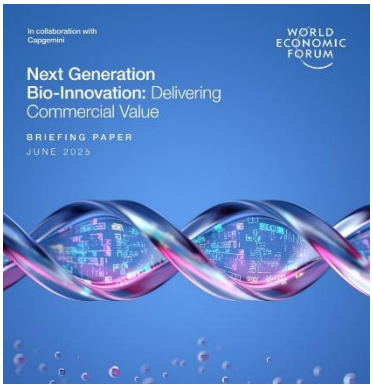
   As part of this cooperation, the following joint report was published:

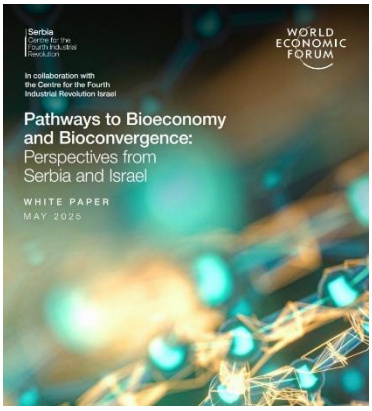
   "Pathways to Bioeconomy and Bioconvergence: Perspectives from Serbia and Israel"

   The report was authored jointly by C4IR Israel and C4IR Serbia, together with the Israel Innovation Authority and Serbia's Office for IT and eGovernment, published on the WEF website, and received global exposure.
   Its objective is to present national strategies for advancing bioconvergence and the bio-economy and to serve as a basis for deeper international collaboration.
   The Israeli chapter focuses on the National Bioconvergence Program and the local ecosystem.

5. The BC Program as an International Standard



In 2025, Program Director Shai Melcer was appointed Israel's representative to the OECD BNCT Committee (Biotechnology, Nanotechnology and Converging Technologies). Within this role, he participated in monthly online discussions and plenary sessions in Paris and drafted professional input to OECD position papers shaping international recommendations on topics such as synthetic biology and its integration with AI.

This activity significantly increased OECD exposure to Israel's BC program, which was selected as a prototype for a multidisciplinary technology domain in the OECD Science, Technology and Innovation Outlook 2025.

**Box 5.1. The Israeli Bioconvergence Program: A prototypical convergence space**

Israel's National Bioconvergence Program is strategically designed to cut across sectors and disciplines bringing together biology, engineering and computational science, and driving innovation in health, agri-food, manufacturing and the environment. Launched in 2022, the initiative combines multiple public offices spanning science, technology and innovation; health; finance; defence; and academia – broadly aligning policy and ecosystem support. Planned public investment in the programme is ~USD 400 million over a decade, attracting ~USD 200 million more through private sector leverage, including international partnerships (e.g. an international bioconvergence challenges programme). The programme has a five-pillar structure:

1. **Research:** National funds invest in multidisciplinary applicative research, supported by high-end research infrastructure and services.
2. **Interdisciplinary research and development (R&D):** Over USD 80 million publicly invested in industrial R&D, start-ups and consortia, closing funding gaps and growing the ecosystems with dozens of new companies. Key themes include biochips, engineered tissues, bioplastics and circular bioeconomy solutions.
3. **Infrastructure:** Significant public investments to establish self-sustained R&D service labs supporting innovation in SynBio, precision fermentation and scale-up, and prototyping and small-scale production of biochips/devices.
4. **Human assets:** Over USD 2 million allocated to various programmes for multidisciplinary training, upskilling and team-building across the academic and industrial pipeline, reaching more than 1 000 people.
5. **Enabling regulation:** A facilitative regulatory environment developed with the Ministry of Health to guide companies through regulatory pathways for complex bioconvergence health and food technologies, resulting in the world's first approvals for alternative milk and cultured beef.

Source: Israel Innovation Authority, https://innovationisrael.org.il/en/article/bio-convergence-israels-next-growth-engine.

## Summary

This report presents a comprehensive overview of the implementation of Israel's National Bioconvergence Program during its initial years. Despite the challenges of an extraordinary period, the first phase of the program was characterized by rich and diverse activity, laying a strong foundation for a multidisciplinary bioconvergence ecosystem. The combined efforts of the Israel Innovation Authority, government ministries, the defense system, and academia enabled a continuous innovation pipeline—from basic research through applied development to commercialization. Alongside these achievements, the report highlights the unique challenges of an emerging multidisciplinary field, including the continued development of human capital, maturation of dedicated infrastructures, and deeper regulatory adaptation.