

## **Requirements For Bio-Fabrication Devices Combining Engineering and Biology Among Israeli Companies and Technion Researchers**

To promote the bio-convergence field as a key driver of economic growth in Israel, it is essential to gather information on infrastructure and service requirements. This involves collecting data on necessary equipment, products requiring services, engineering skills, expertise in design processes, and other relevant information. The Samuel Neaman Institute for National Policy Research, in collaboration with the Center for Micro and Nano Fabrication at the Technion (MNFU), has examined specific needs of the Israeli industry and Technion researchers in micro and nano fabrication for biomedical applications.

The aim of this research is to identify the current and future requirements of companies that combine biology and medicine with engineering and computer science in terms of infrastructure and services for bio-fabrication. This includes services such as the production of micro or nano electronic devices for use in biological and medical applications.

The research methodology comprised a literature review of infrastructure mapping in selected bio-fabrication centers across the globe, creating a database of Israeli companies involved in bio-convergence-related fields, conducting an online survey among these companies, and carrying out in-depth interviews with stakeholders from the academic, private, and public sectors in Israel. Additionally, the research team interviewed individuals from outside Israel with extensive experience in constructing and operating bio-fabrication facilities.

Over 100 companies responded to the online survey, with around 40% of them indicating a current or future need for bio-fabrication services for their activities. However, a significant number of companies (68%) are currently utilizing or seeking services outside of Israel.

The interviewees expressed wide agreement regarding the need for a national bio-fabrication infrastructure that would serve start-up companies, SMEs, and academic researchers alike. The report proposes a construction and operation model for this infrastructure based on a comprehensive literature review and interviews. Moreover, it is evident that such infrastructure should integrate academic and industrial disciplines and include experts in regulatory affairs, quality assurance, and business development.

The infrastructure must be capable of meeting the requirements for prototype planning and small-scale production, encompassing the design and manufacture of Micro-Electro-Mechanical Systems (MEMS). Specific areas of focus include microfluidics, biosensors, and 3D printing.

Furthermore, it is crucial to consider the human-talent development and training capabilities of this infrastructure. Such capabilities can contribute to the growth of the Israeli ecosystem by training job-ready individuals with expertise in bio-fabrication-related fields who can integrate into Israeli companies requiring such knowledge.

The Micro-Nano Fabrication Unit at the Technion is currently offering services to Israeli companies and academic researchers for designing and producing biological-electronic devices on a small scale. The unit's services can be further expanded to serve additional requirements of the Israeli ecosystem.