Professional Development

The School of Engineering at the Hebrew University of Jerusalem is recruiting faculty for tenure-track positions in systems biology & bioengineering. Contact us for details.

BioDesign: Medical Innovation

Igniting the next generation of biotechnology start-ups

BioDesign is a multidisciplinary, team-based approach to medical innovation, created by the Hebrew University of Jerusalem and its affiliated Hadassah Medical Center. The program takes outstanding medical fellows, bioengineering and business graduate students and tutors them in the science and practice of bringing a medical innovation to the market. Groups identify clinical needs, carry out careful market analysis and produce a patent-protected engineering solution.

BioDesign innovation is taught by Hebrew University faculty, clinical experts, entrepreneurs, business executives, intellectual property attorneys, and venture capitalists. As such, it provides a unique real world experience in an academic environment for nurturing a new generation of medical innovators. The program is sponsored by medical device giants Boston Scientific and the Terumo Medical Corporation.

Learn more at: **BioDesignIsrael.com**
You Tube Channel: **bit.ly/biodesign**

Bioengineering

Bioengineering
Hebrew University

Grass Center for Bioengineering
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THE RACHEL AND SELIM BENIN SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

Bioengineering

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Solutions For a New Economy

Israel is a global leader in biomedical innovation as a result of its academic strength and spirit of innovation. Government investment coupled with cutting edge clinical centers, an excellent research base, and top engineers create a thriving industrial community.

Blooming BioTech Sector

Of the existing 920 life sciences companies, two thirds were founded in the last decade. Remarkably, 40% of these new companies are already revenue-generating entities and 27% are at the seed or pre-clinical stages.

The industry is heavily biased toward the medical device sector, with 60% of the companies. Biotech and the pharmaceutical sectors hold 17% and 11% of local life sciences companies.

Alexander Grass Center for Bioengineering

Bioengineering is a multidisciplinary field that weaves together biology, physics, chemistry, computer science and medicine aiming to advance knowledge and create tangible applications in life sciences and clinical medicine. This rapidly growing field provides a new level of understanding of biological systems, from the molecular scale to entire organisms by applying engineering-based approaches.

The Hebrew University of Jerusalem, Israel's first university, is a multidisciplinary research institute, where intellectual pioneering, cutting-edge scientific discovery and a passion for learning flourish. Founded in 1918 by Albert Einstein and Sigmund Freud, the university spans seven faculties, sixteen schools and over 100 interdisciplinary research centers. Counting eight Nobel laureates and one Fields Medal among its faculty and alumni, the university is proud of its position at the cutting edge of world science. The Hebrew University is ranked as one of the top 100 universities worldwide, and has recently been ranked by *The Scientist* as the 2nd best place to work outside the United States.

The Hebrew University of Jerusalem established the Center for Bioengineering in 2005 from a position of strength and a long history of medical innovation. Members of the center include Prof. Aaron Lewis, the father of Near Field Optics and a recognised pioneer of laser surgery; Prof. Chaim Lotan, director of Hadassah Heart Unit and a leading medical device entrepreneur; and Prof. Shimon Benita, head of the Institute of Drug Development and a world leader in nano-medicine.

The Center for Bioengineering has a diverse and multidisciplinary faculty spanning 40 members specialising in engineering, medicine, life sciences, chemistry and computer science. It offers a five-year direct PhD program in bioengineering to outstanding Israeli and international students. The center offers an advanced course in medical innovation and entrepreneurship in partnership with Hadassah and Shaare Zedek Medical Centers as well as the School of Business Administration.

Bioengineering
Hebrew University

Genomics and Systems Biology

Automation and big data define new paradigms of scientific discovery

Computational techniques and high throughput screening platforms have become a basic research tool in modern biology. Robotic platforms, nanotechnology-based devices and automated sequencing provide massive amounts of data, enabling a deeper understanding of complex biological responses to injury or disease.

Innovation in this field is driven by interdisciplinary scientists such as Nir Friedman, winner of the Juludan Prize and two prestigious European Research Council grants. Prof. Friedman works explores the role of DNA organisation in cellular decision making, using advanced automation and robotics. He is the director of the Israeli Excellence Center in Chromatin and Gene Regulation.

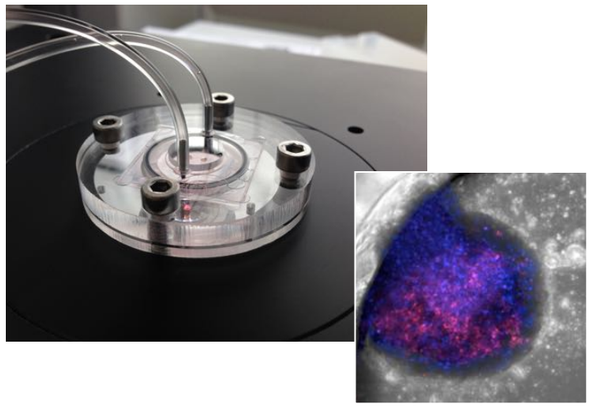
Tommy Kaplan is an emerging computational biologist whose work is focused on computational epigenomics and chromatin. Dr. Kaplan is the Regional Winner of the 2009 GE & Science Prize for Young Life Scientists.

NanoTech and Human-on-Chip

Nanotechnology and biology combine to change the future of drug discovery

Nanotechnology already changed the world around us. Hiding in our cars, smartphones, laptops, and TVs, integrated sensors and silicon microchips changed the way we live. Today, a similar revolution is changing the study of biology and the practice of medicine.

This emerging field is led by bioengineers such as Yaakov Nahmias, director of the Grass Center for Bioengineering, winner of the Rappaport Prize for Biomedical Sciences, NIH career award, and a prestigious European Research Council grant. Prof. Nahmias group produces functional liver cells



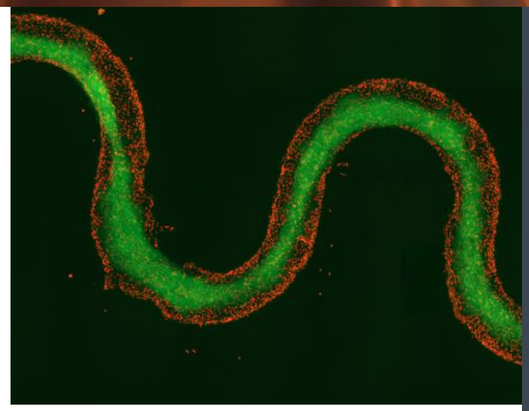
from human stem cells, creating artificial livers in microfluidic devices. Integrating nano-sensors in the living tissue permits real time detection of changes in metabolism or viability. The technology developed for the drug and cosmetic industry is poised to change safety evaluation. Such devices would fundamentally reduce the use of animals in research by producing a cheaper, safer, more reliable alternative to animal toxicity screening.

Similarly, Micha Spira developed a novel neuroelectronic microchip with gold-mushroom-shaped sensors. The microchip offers unparalleled non-invasive recording of neuronal activity and stimulation, dramatically changing the field of neural prosthetics and brain-machine systems.

Mechanics of Biology

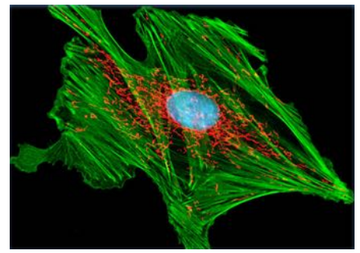
Unraveling the physical basis of biological events

Biological physics highlights the basic principals that enable cells and tissues to exert and respond to external forces. Mechanical forces can direct stem cell development, cause leaves to spiral, or lead to tissue regeneration and repair. Work ranges from advanced physics to modelling.



Eran Sharon is a recognised leader in the field of biophysics, winner of a European Starting Grant and numerous awards. Prof. Sharon work describes the basic principles of soft tissue deformation, ranging from growing leaves to folding paper. His laboratory aims to create biologically inspired soft robots.

Amnon Buxboim is an up-and-coming bioengineer whose work is focused on the interactions between stem cells and the physical environment. Dr. Buxboim discovered how cells feel their surroundings through the protein lining of the nucleus. These projects provide an unparalleled understanding of early human development and insights into in human fertility.



Living, playing and learning in Jerusalem

Jerusalem Metropolitan Area

Many are familiar with the ancient beauty of the city of Jerusalem, its rich history and importance to world religions. And yet over the last 60 years the city bloomed into a modern metropolis of a million residents. The city is home to the Israel Museum, site of the Dead Sea scrolls, the

Museum of Islamic Arts, and Yad Vashem. It is home of the world renowned Israeli Philharmonic Orchestra, the site of International Film and Jazz Festivals. Jerusalem offers students and travellers world-class cuisine and an active nightlife in the many dance clubs, bars, and live music venues that line the streets of downtown.

The Center for Nanoscience and Nanotechnology

The Harvey M. Krueger Family Center for Nanoscience and Nanotechnology was established in 2001 by the Hebrew University. The center supports a state-of-the-art clean room with advanced photolithography, metal deposition, and E-beam facilities. The center also includes advanced characterisation facilities including AFM, electron microscopy,and X-ray tools.
http://nanoscience.huji.ac.il/

The Center for Genomic Technologies

The Center for Genomic Technologies at The Hebrew University serves as a National Research and Service Lab dedicated to providing genomic services to the academic, medical and industrial sectors.

The center provides DNA, and RNA Sequencing, Genotyping (Microsatellite analyses, SNP, whole genome scan), GeneArray, Bioanalyzer, and qRT-PCR technologies.

http://www.bio.huji.ac.il/eng/services.asp