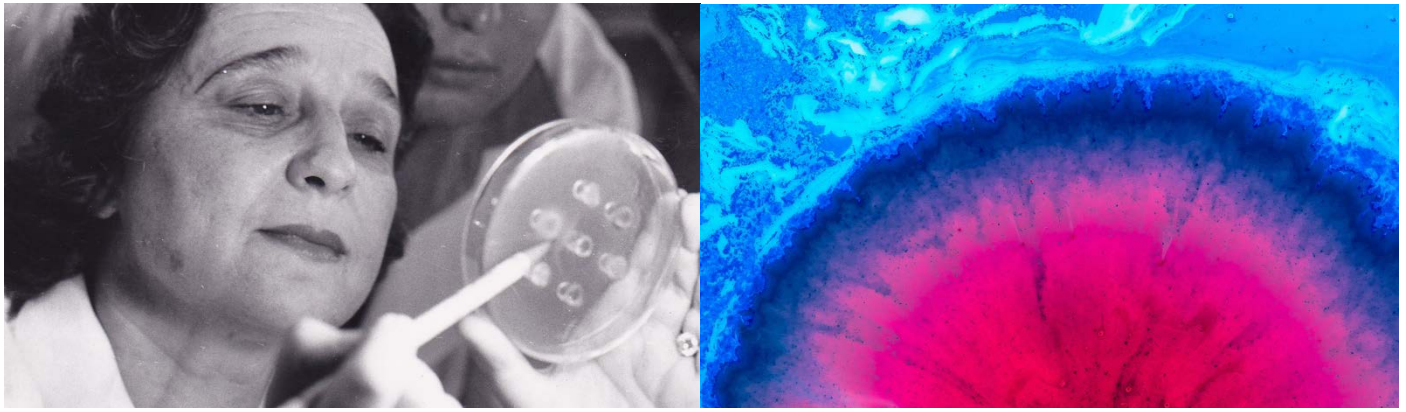




Computational Medicine

Harnessing Big Data to Combat Disease



HEBREW UNIVERSITY'S NEW INSTITUTE FOR COMPUTATIONAL MEDICINE WILL BRIDGE THE GAP BETWEEN DATA SCIENCE AND PATIENT CARE, REPLACING THE 'ONE SIZE FITS ALL' MODEL OF MEDICAL TREATMENT WITH DATA-DRIVEN, PERSONALIZED HEALTH SOLUTIONS.

Despite great advances made in understanding and treating human disease, we are still struggling with the major complex maladies of our time: cancer, neurodegenerative, cardiovascular, metabolic, and infectious diseases. To combat these illnesses, we need to develop a fundamentally new approach, now made possible via advances in data science. Treating disease effectively now requires the integration of individual patient genetic and molecular profiles with that of thousands of other patients, and the application of algorithms to detect patterns and tailor effective personalized treatment. Such big-patient-data architecture and algorithm composition require the embedding of computational approaches within the medical arena. This is the promise of Computational Medicine.

An Algorithm for Success

Computational Medicine will leverage Hebrew University excellence in medicine and in computer science to transform medical research and practice by integrating computational data analysis, and by training the next generation of computation-science trained doctors and researchers.

At the heart of this initiative will be a core team of leading scientists, clinicians, and clinician-researchers with expertise in computational approaches to biomedical research and clinical treatment. Some are already in place, while others will be recruited. A broad group of life and data-science researchers will also be affiliated with this initiative. Key to this endeavor is a new state-of-the-

art medical research and teaching facility, designed specifically to support the workflow of such research, from data acquisition and storage to in-depth data analysis and hypothesis generation to testing and developing novel methods for precision disease diagnosis, treatment, and prevention. The facility will provide cutting-edge infrastructure, computational systems, data systems, broad-based patient information databases, testing facilities, and more. The Institute will reside on the Ein Kerem medical campus, alongside existing research buildings and the Hadassah Medical Center.

The Institute will focus on research and developing therapies pertaining

to inflammatory and infectious diseases, cancer, metabolic diseases, and aging, aiming to replace conventional models of medical treatment with accurate, predictive, data-driven, patient-oriented digital approaches.

With a powerful group of proven medical researchers and computer scientists, a specially designed facility, a new generation of computational-trained medical researchers, data banks, advanced equipment, and a drug modeling unit – all in close proximity to a major medical center, Computational Medicine @ Hebrew University is sure to break new ground in harnessing the power of data to cure disease.

Philanthropic Opportunities

NAMING

One Computational Disease Research Center (cancer, aging, metabolic or infectious)	\$4 Million
One research floor in the new Computational Medicine Building	\$2 Million
Teaching complex (lecture hall and two classrooms)	\$2 Million
Laboratory complex (3 laboratories)	\$2 Million
New faculty recruitment	\$200,000-\$1 Million
Faculty Development Lectureship	\$1.25 Million
EQUIPMENT: Super Resolution Microscope (imaging)	\$800,000

Donor Recognition

Physical facilities, research units, and scholarships may be named according to the donor's wishes.

HU by the numbers

23,000+

STUDENTS FROM ISRAEL AND 100 OTHER COUNTRIES

10,750+

REGISTERED PATENTS

3,030+

INVENTIONS

1050+

LICENSED TECHNOLOGIES

560

POSTDOCTORAL RESEARCHERS FROM 26 COUNTRIES

32,000 +

PAPERS IN BIOMEDICAL RESEARCH

170+

SPIN-OFF COMPANIES

100

ERC GRANTS FROM 2007 - 2017

The Hebrew University Advantage

Jerusalem is growing as a high-tech powerhouse. Home to increasing numbers of high-tech and bio-medical start-ups and rated among the top 28 best tech ecosystems in the world (Startup Compass), the Hebrew University of Jerusalem is an ideal home for this multidisciplinary endeavor in computational medicine.

A Tradition of Medical Innovation

Hebrew University scientists have changed the face of medicine – from elucidating the principles of DNA methylation and epigenetics (Cedar, Razin) to pioneering a new molecular understanding of blood vessel formation – leading to new treatments for cancer and blindness (Keshet); from drugs to treat Alzheimer's (Weinstock-Rosin) to cancer (Barenholz, Gabizon), HU faculty have been on the cutting edge of medical research — most recently with the first breakthrough in AML treatment in 40 years (Ben-Neriah).

Access to Data

Through data-sharing agreements with Jerusalem's major medical centers and HMO's as well as the Israel Defense Forces, University researchers will have access to detailed medical records and data as well as to those of unique, genetically well-defined populations in the Jerusalem area, providing a unique opportunity for data-driven studies.

Interdisciplinary Inquiry

Interdisciplinary research is a Hebrew University hallmark, and similarly, this project will bring together not only computer science and medicine, but also researchers from the life sciences, pharmacy, brain sciences, nanoscience, veterinary medicine, and more — as well as clinicians from affiliated hospitals.

More with Less

Israeli research is well known for delivering 'greater bang for the buck', able to accomplish significant leaps in scientific understanding with more modest means than counterparts abroad.