

The University of Toronto – Hebrew University of Jerusalem Research & Innovation Alliance

Strengthening Research and Entrepreneurial
Ties Between Canada and Israel



“U of T has a long and distinguished history of collaborating with Hebrew University and other leading Israeli institutions. The Alliance builds on this history and puts our principles of global engagement and collaboration into action.”

Janice Stein, Professor, Munk School of Global Affairs and Public Policy and Belzberg Professor of Conflict Management, Department of Political Science



Students at the Hebrew University of Jerusalem's Edmond J. Safra campus. The University's founders include Albert Einstein, Martin Buber, and Sigmund Freud.

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Overview

The University of Toronto (U of T) and the Hebrew University of Jerusalem (HUJI), two leading global research universities, have a long and unwavering friendship and a productive history of collaboration.

Building on this foundation and the enduring bonds between Canada and Israel, U of T and HUJI have formed a strategic partnership—the University of Toronto-Hebrew University of Jerusalem Research & Innovation Alliance.

The strategic partnership will elevate the global profile of both universities and support leading researchers to address some of our greatest global challenges—including gaining a better understanding of COVID-19 and how to treat it.

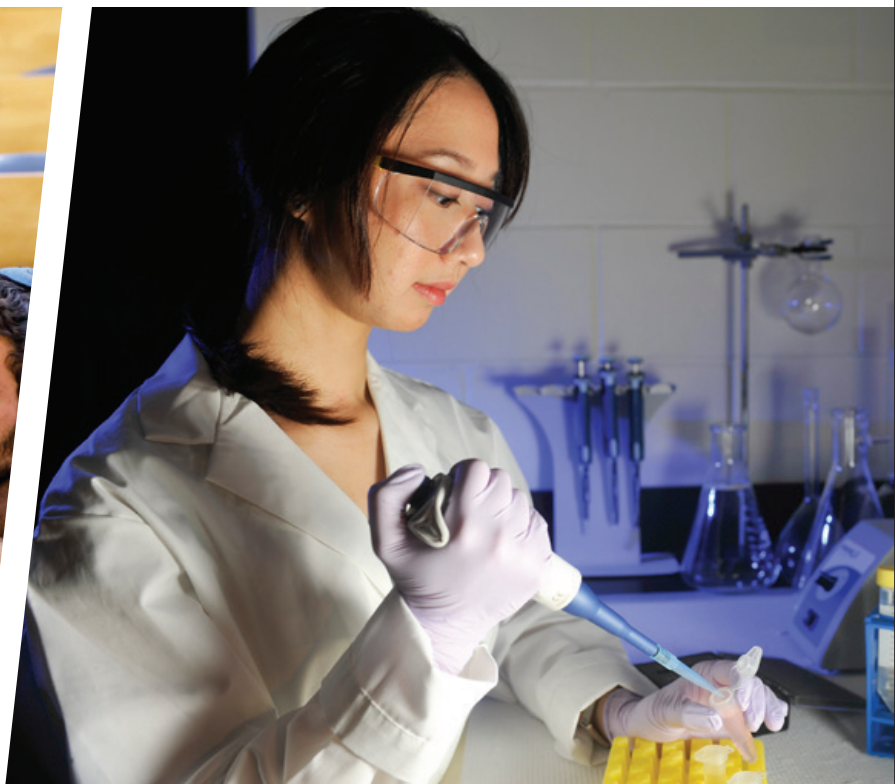
The Alliance will achieve this impact through two major initiatives. First, we will catalyze advanced research by international, interdisciplinary teams of researchers working at U of T and HUJI.

The Alliance will also build an “International Entrepreneurship Highway” that gives student entrepreneurs from both universities experience in the other’s innovation ecosystems.

U of T, Canadian Friends of Hebrew University (CFHU) and the Halbert family have established a \$5.9 million endowment that will support the Alliance. Now, to realize our full vision, we seek additional support from the community to increase funding to \$20 million or more. On the following pages, we are pleased to provide further details about this vision and the far-reaching benefits for both universities and for the close relationship between Canada and Israel.



Left: Students studying in Gottlieb Auditorium, Edmond J. Safra campus, Hebrew University of Jerusalem **Right:** A researcher at U of T’s Scarborough campus.



Combining the Strengths of Two World-Class Institutions

The Hebrew University of Jerusalem

HUJI is Israel's premier university, continuously ranked as a leading university and among the top 100 research institutions worldwide. Building upon its reputation for excellence and its leading role in the scientific community, HUJI expands the boundaries of knowledge for the benefit of all humanity while also advancing research into Jewish cultural, spiritual and intellectual traditions. Many of HUJI's faculties, schools, and departments are ranked exceptionally high, and the University has established itself as a global innovation powerhouse. Yissum, the University's technology transfer company, is ranked 15th in the world in terms of revenue.

- 100+ research centers and 6 affiliated medical institutes
- 3,950+ research projects
- 8 Nobel Prizes; 1 each of Abel Prize, Canada Gairdner International Award, Fields Medal, Turing Award
- Registered 10,750+ patents; 3,030+ inventions; 1,050+ licenses
- 170 spin-off companies; 600 commercial products
- Highly ranked faculties/departments include Mathematics, Law, and Public Administration



Combining the Strengths of Two World-Class Institutions

The University of Toronto

U of T is Canada's leading institution of higher learning and is ranked 18th in the world overall by both the Times Higher Education World University Rankings and by the U.S. News & World Report global university rankings. Recognized as Canada's most innovative university, U of T is a global leader in transforming groundbreaking ideas into products, services, companies and jobs. The University's tri-campus system is renowned internationally for cutting-edge research and teaching that provides students with a comprehensive global education.

- **Ranked 4th in the world for the performance of scientific papers**
- **Consistently ranked among the top 5 in the world for research output**
- **8 Nobel laureates associated with U of T**
- **\$1.5 billion in investment secured and 500 startups launched by U of T entrepreneurs since 2010**
- **\$368 billion in annual revenues by alumni-founded ventures globally**
- **U of T Entrepreneurship ranks among top 10 university-managed business incubators in the world**



The Powerful Benefits of the Alliance

From COVID-19 to climate change to income inequality, the most pressing challenges can rarely be addressed by a single university or within a single discipline. Responding to these challenges requires international collaboration that brings together the world's brightest minds from top universities for comprehensive, interdisciplinary research. The Research & Innovation Alliance supports this powerful approach to discovery with important additional benefits for both universities in key areas.



High-Impact Research

The Alliance will empower collaborative teams of researchers from U of T and HUJI to tackle global challenges and produce transformative research spanning

the arts and humanities, sciences and social sciences, engineering and medicine, and law.



Entrepreneurial Ecosystems

The International Entrepreneurship Highway will help both universities attract student entrepreneurs and will strengthen connections

between Toronto's and Jerusalem's burgeoning entrepreneurial ecosystems.



Top Research Talent

The Alliance's research and training opportunities will help both universities to attract exceptional researchers and students from around the globe.

It will also establish a robust research pathway that enhances collaboration among top researchers in Toronto and Jerusalem.



A Global Message

The Alliance, a uniquely broad and comprehensive partnership, will illustrate the tangible societal and economic benefits of global

collaboration between leading research-intensive universities in Israel and Canada.



Interdisciplinarity and Cultural Fluency

The Alliance will equip undergraduate and graduate students as well as postdoctoral researchers

with knowledge and proficiency across a range of disciplines along with the intercultural skills to collaborate with colleagues from around the world.

Generating Research to Confront Global Challenges



The Alliance will establish a new global model for leading-edge international research partnerships by bringing together researchers and students from across a broad range of disciplines at the University of Toronto and the Hebrew University of Jerusalem.

Research partnerships will be organized in two streams, the first focusing on the life sciences, natural sciences and applied sciences, while the second stream will focus on social sciences, humanities, law and social work.

Each project will be led by six or more researchers (three or more from each university) and will receive \$150,000 per year, for up to four years. These investments will fund postdoctoral researchers and—when the COVID-19 restrictions end—will cover travel for researchers and students between Toronto and Jerusalem, and include collaborative workshops and symposia in both cities.

The Alliance will select one or more new four-year projects each year, alternating between the two streams, and may also occasionally provide small, one-time grants as seed funding to support other promising projects.

Among the key criteria for selecting projects will be their potential for advancing our knowledge, producing a positive impact in our lives and building on the complementary strengths of our two universities. Projects will also be chosen for their long-term viability and potential for securing additional funding to continue research after the four years of support from the Alliance.

To launch the Alliance, the selection committee has chosen two projects for the first round of full funding and an additional two projects for seed funding. These projects are discussed on the following pages.

HUJI's Saul and Joyce Brandman Science Laboratories provide cutting-edge research facilities for the study of biology, physics, and pharmacology. The University conducts 43% of Israel's biotechnology research.



Funded Projects 2020–2024



1. Protein Engineering and Design and the Development of Antiviral Inhibitors to Fight the COVID-19 Outbreak

Principal Investigators

- Julia Shifman, Department of Biological Chemistry (HUJI)
- Sachdev Sidhu, Donnelly Centre, Temerty Faculty of Medicine (U of T)

Description

Protein engineering and design is a rapidly growing discipline with far-reaching applications in material science, bioelectronics, biotechnology, food technology, vaccine development and drug design. This discipline offers a promising approach to developing treatments for COVID-19 and other diseases, including cancer.

Building on knowledge gained from previous coronavirus outbreaks, this project will make predictions about the function of proteins that power SARS-CoV-2—the virus causing COVID-19. The team will develop a toolbox of molecules and explore their therapeutic potential for disarming SARS-COV-2, improving our knowledge of the virus and helping prepare for similar viruses in the future.

Funded Projects 2020–2024



2. The Quaternary in the Kalahari: Tracking Climate Dynamics and Human Evolution in the Kalahari Basin (South Africa, Botswana, Namibia)

Principal Investigators

- Ari Matmon, Professor,
Earth Science Institute (HUJI)
- Michael Chazan,
Department of Anthropology (U of T)

Description

Geological and archeological research in the East African Rift System have given scientists insight into the climate dynamics that existed during early stages in human evolution. To build a more complete picture of the climate in which we evolved, and of the patterns of early human activity, this project will use innovative

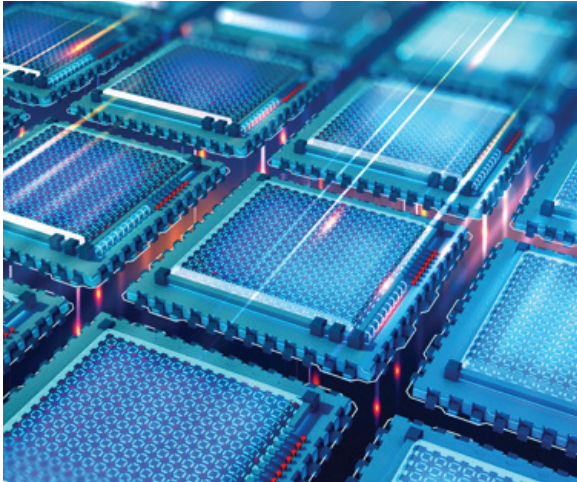
techniques in geological research to investigate the Kalahari Basin, another important region for human evolution.

The Kalahari Basin spreads over more than 2.5 million square kilometres in South Africa, Botswana, and Namibia. Sediment deposits in the basin over the last few million years have recorded a range of environmental conditions. Exploring these deposits will shed new light on how early humans adapted to climate conditions as they evolved.

Understanding the environmental conditions in this region over several million years will shed new light on the evolution of its flora and fauna, and advance our understanding of early human behavior in southern Africa.



Seeded Projects



1. Coherence Effects in Quantum Phenomena: From Biological Systems to Quantum Technologies

Coordinating Investigators

- Dvira Segal, Department of Chemistry and Department of Physics, Centre for Quantum Information and Quantum Control (U of T)
- Roi Baer, Fritz Haber Research Center for Molecular Dynamics and Institute of Chemistry (HUJI)

Description

The new field of quantum biology explores the role of quantum mechanics in biological functions, for example, in the ability of birds to navigate using Earth's magnetic field, and in the inner workings of photosynthesis.

The project will draw on strengths in chemistry, physics, molecular dynamics, quantum information and engineering across both universities to better understand quantum processes and improve our control over them.

2. Towards a Unified Theory of Learning and Memory (Unifying L&M)

Principal Investigators:

- Sheena Josselyn, The Hospital for Sick Children, Josselyn Lab (U of T)
- Paul Frankland, The Hospital for Sick Children, Frankland Lab (U of T)
- Melanie A Woodin, Woodin Lab (U of T); Dean, Faculty of Arts & Science (U of T)
- Adi Mizrahi, Mizrahi Lab (HUJI)
- Ami Citri, Citri Lab (HUJI)
- Inbal Goshen, Goshen Lab (HUJI)

Description:

More than 30 million people in North America alone suffer from learning or memory disorders. These disorders cost Canada and Israel in excess of \$50 billion and \$8 billion each year, respectively. Preventing and treating them requires a better understanding of how healthy brains acquire and store information.

This project aims to establish a unified theory of the mechanisms that underlie learning and memory at the cellular level—a world first. Gaining this knowledge would be a transformative advance for the brain sciences, and it could eventually lead to new ways to support people with learning disabilities.

International Entrepreneurship Highway



Both U of T and HUJI have impressive histories of supporting translational research as well as building the extensive entrepreneurship networks needed to launch technology and other types of startups. The Research & Innovation Alliance will build on these successes.

The U of T– HUJI Research & Innovation Alliance will develop a new entrepreneurship partnership—an International Entrepreneurship Highway (IEH)—that promotes the two-way flow of people, startups, funding, and regional expertise.

The partnership will support as many as 20 students per year (10 from each university) and will offset costs including airfare and housing. For up to a year, students will gain valuable experience and additional income as paid interns at a startup in the partner city. They will be supported by a program staff member from each university located in the partner ecosystem.

The International Entrepreneurship Highway will be informed by existing successful programs including the following two models:

Toronto and Singapore

U of T has an IEH with the National University of Singapore (NUS). Since 2018, NUS has placed 30 student-entrepreneurs in paid internships with start-ups in Toronto. They are also enrolled in entrepreneurship courses at U of T. In 2020, U of T sent its first cohort of nine undergraduate students for similar opportunities in Singapore.

HUJI International MBA

HUJI's one-year international English-language MBA is focused on entrepreneurship and innovation. Throughout three semesters in the program, international students take classes and complete a professional internship in Israel. International students are exposed to Israel's thriving hi-tech firms and start-ups and network with faculty and local students.



The Hebrew University of Jerusalem hosts a wide variety of research endeavours across its six campuses.



Transformative Ideas Need Visionary Benefactors



To bring together U of T and HUJI to conduct groundbreaking research and establish a Toronto-Jerusalem innovation ecosystem requires visionary leaders who recognize the great value and potential impact of the Research & Innovation Alliance.

The two universities are offering opportunities to champion the U of T–HUJI Alliance as a whole or to support critical components that will empower it to succeed.

The following naming opportunities are available for philanthropic champions interested in playing a leading role in helping the Alliance to achieve its ambitious goals in both Canada and Israel. Dependant on level of support, recognition benefits may include all or some of the following: inclusion in all marketing and communications; personalized annual reports; induction to U of T's Chancellors' Circle of Benefactors and HUJI's Wall of Benefactors; exclusive event invitations and one-on-one meetings with research leaders.

Overall Initiative \$15 million Endowed / Expendable options are available

An endowed gift will name the entire initiative across all branding and with full recognition benefits. Funds will provide an annual income that supports two research projects and five student exchanges per year.

Research Streams

\$5 million Endowed / \$1,500,000 Expendable

Either an endowed or an expendable gift will name an entire research stream such as Life Sciences, Natural Sciences and Applied Sciences. Endowed funds will permanently support two research projects annually while expendable funds will name a stream for five years.

Research Catalyst Fund

\$2.5 million Endowed / \$750,000 Expendable

An endowed gift will name a catalyst fund that will provide ongoing support for one or more initiatives each year. Expendable funds will establish a fund that provides this support over four to five years.

Post-Doctoral Fellowships

\$1 million Endowed / \$300,000 Expendable

An endowed gift will support one or more joint postdoctoral fellowships while expendable funds will provide this support for approximately four to five years.

Entrepreneurship Exchange Fund

\$500,000 Endowed / \$100,000 Expendable

Each named fund will support academic exchange and collaboration activities relating to entrepreneurship



Left: Students in U of T Professor Joyce Poon's lab gain hands-on experience in photonics.

Right: The Rachel and Selim Benin School of Computer Science & Engineering at HUJI has a strong international reputation.

Our Volunteer Committee

The University of Toronto and the Hebrew University of Jerusalem are grateful to the following members of the community who have provided invaluable leadership and support to the U of T–HUJI Research & Innovation Alliance.

Ronald Appleby (Chair)
Partner, Robins Appleby LLP

Jonathan Feldman
Partner, Goodmans LLP

Perri Kirshenblatt
Vice-Chair, UJA Women's
Philanthropy

Nathan Lindenberg
Partner, Lindenberg
and Lindenberg

Dorit Mevorach

Harley Mintz
Principal, The Targeted
Strategies Group

Hinda B. Silber
Director, Canadian Friends
of Hebrew University

Randal Slavens
Vice President, Risk Management
and Adjudication Strategy,
Canada Guaranty Mortgage
Insurance Company

Michelle Vigod
Partner, Goodmans LLP

“The attention paid to research in engineering and medicine, the sciences, the social sciences, humanities, and law reflects our mutual interest in creating novel solutions for some of the most pressing current issues.”

Volunteer Committee Chair **Ronald Appleby** on the alignment between the University of Toronto and the Hebrew University of Jerusalem.

Conclusion

Together, the Hebrew University of Jerusalem and the University of Toronto will establish a new global model for comprehensive international research and innovation partnerships. The Alliance will train the next generation of researchers with the skills to collaborate across disciplines and cultures and support wide-ranging, groundbreaking research that will benefit all of humanity. In addition, it will drive economic growth in both Israel and Canada while strengthening the cultural and economic bonds between our two countries.

We hope you will join us in this important and exciting initiative. The ambitions of our fundraising efforts match the ambitions of the Alliance to confront global challenges by bringing together entire fields of expertise and the resources of two of the world's great cities, anchored by their leading universities.

For more information, contact:

Glenn Best

Director, Major Gifts
Division of University Advancement
University of Toronto
21 King's College Circle
Toronto, Ontario M5S 3J3
t. 416.978.2540
glenn.best@utoronto.ca

Debbie Dankoff

Vice-President, National Development
Canadian Friends of the Hebrew University
1310 Greene, Suite 320
Westmount, Quebec H3Z2B2
t. 514.932.2133
ddankoff@cfhu.org

Ambassador Yossi Gal

Vice President
University Advancement and External Relations
Hebrew University of Jerusalem
t. +972.2.5882804
yossigal@savion.huji.ac.il



UNIVERSITY OF
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