Report on the State of the Sciences In Israel 2025

האקדמיה הלאומית הישראלית למדעים
المجمع الوطني الإسرائيلي للعلوم والآداب
THE ISRAEL ACADEMY OF SCIENCES AND HUMANITIES

Extended Summary

The 2010 amendment to the Israel Academy of Sciences and Humanities Law (1961) stipulates that the Academy must submit a report on the state of science in Israel to the government and the Knesset once every three years. The fifth report, presented here, surveys the state of science in Israel with an emphasis on basic research across all fields of science: the humanities, the social sciences, the exact sciences, and the life sciences and medicine. The report also examines the research infrastructure necessary for conducting scientific research, as well as the international standing of Israeli academia. It highlights achievements, identifies gaps and challenges, with respective recommendations for improvement, in order to strengthen and advance science and research in Israel. Basic science is the cornerstone upon which Israeli society and economy rest, and its contribution to the security of the state and to its social resilience is invaluable.

A designated committee, with six subcommittees examining focused topics or entire fields, prepared the report over the course of approximately two years. The 31 members of the subcommittees are among Israel's leading scholars in the various disciplines. As part of their work, the committees met with dozens of officials in the higher education system and the scientific establishment in Israel, as well as with bodies and organizations associated with them, received written reports, conducted site visits, and collected multi-year data both on the state of science in Israel and on its standing compared to other countries.

The report was prepared during one of the most difficult periods in Israel's history. The war that broke out in October 2023 and lasted approximately two years affected many events and processes at the national level and did not spare Israeli academia. The geopolitical situation led to a significant intensification of both the overt and covert academic boycott, whose far-reaching implications for academic research remain to be seen. The report dedicates a chapter to analyzing the impact of the war on Israeli research and on Israel's position in the international arena.

Several central issues arose repeatedly and independently in the deliberations of the subcommittees, pointing to the need for a conceptual change in the conduct of Israeli science and research as well as to their importance for the future of Israeli science:

Redefining academic excellence for each individual researcher as well as for entire disciplines. The committees found that currently entrenched patterns for evaluating academic excellence do not necessarily provide optimal metrics to measure the quality of any particular research, researcher, or scientific discipline. This calls for rethinking criteria for a new, content-based model to evaluate excellence. Therefore, a dedicated committee was recently established by the Israel Academy of Sciences and Humanities to look more closely into the issue of academic excellence and to formulate guidelines that will serve the Planning and Budgeting Committee of the Council for Higher Education (VATAT) and the various research institutions.

Reinforcing the interface between basic research and the Israeli economy, society, and industry. This need is evident across all research fields: in the social sciences and humanities emphasis was placed on transferring knowledge from basic research to the realms of education, health, welfare, and culture; in the exact sciences, on strengthening the interface between basic research and industry in terms of human capital, research infrastructure, and joint research programs; and in the life sciences and medicine, on transferring knowledge to hospitals and to the biotechnology sector. Consequently, the Israel Academy of Sciences and Humanities has decided to consider recommending the establishment of a national fund for applied research.

Building a supercomputer to advance academic research, leveraging artificial intelligence. The call for such a supercomputer arose across all disciplines that use AI tools, and stems from the understanding that it could have a revolutionary and wide-ranging impact on all fields of science, research, and innovation. There is also a need to invest in developing the human capital necessary for the supercomputer's operation and optimal utilization at all academic levels – from graduate students to senior faculty members.

In light of the central issues that were identified, the Israel Academy of Sciences and Humanities has formed a broad-based committee, in order to formulate a "roadmap for Israeli science" that will address the changes required to advance Israeli science in the coming decades.

The following presents the key points from each of the report's chapters, along with their principal findings and recommendations. For in-depth analysis and a detailed list of recommendations, see the dedicated chapters of the full report (in Hebrew).

Overview and Trends

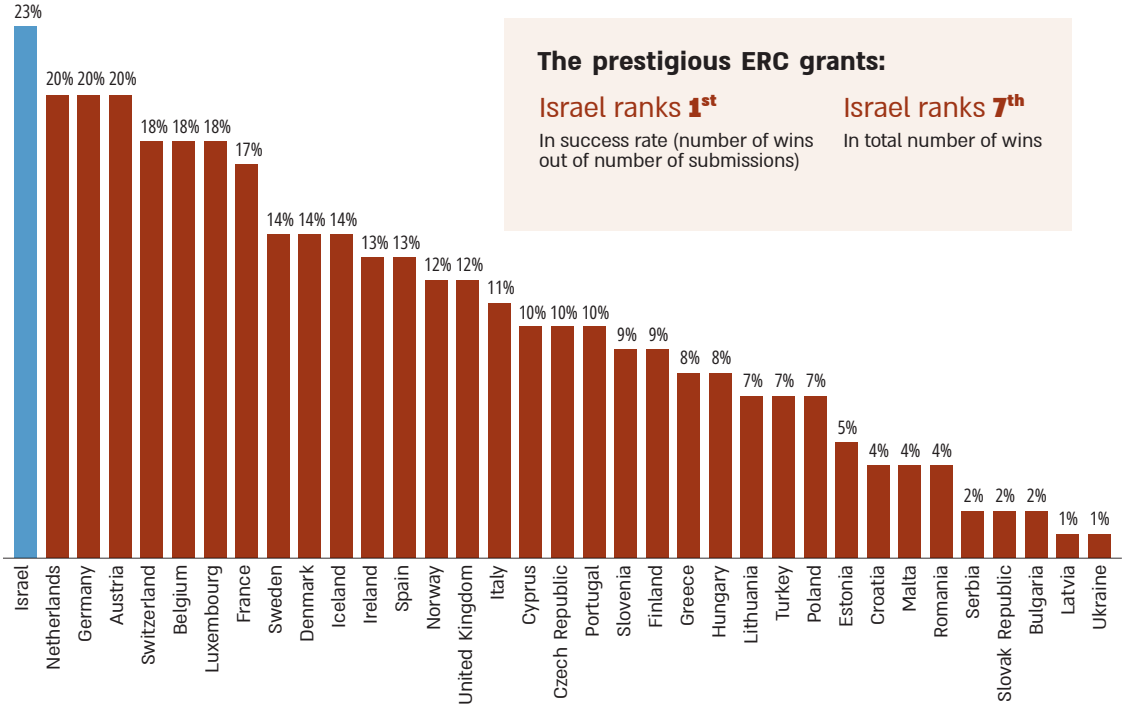
The report presents a complex reality of scientific excellence and international recognition of Israeli researchers and research, alongside concerning trends: declining national investment in academic research as well as in research outputs over the past decade and an intensifying international boycott of Israeli academia over the past two years.

Research Outputs

Israeli researchers continue to secure the most prestigious international grants, including those of the European Research Council (ERC), and win major international scientific awards that attest to their high level of research. However, the success rate for the 2025 ERC Starting Grant, for example, was lower than in previous years, raising questions about whether this was an anomalous result or the start of a worrying trend.

The research outputs indicator reveals a troubling picture of gradual decline in Israel's global standing. Israel's relative share of publications out of the total of global publications is decreasing, and its international scientific ranking is declining even when weighted for population size. Moreover, as detailed below, the war and the international boycott over the past two years are affecting scientific output at academic institutions and the overall standing of Israeli academia. These negative impacts will be felt for years to come and may be particularly pronounced over the next few years.

Success rate by country in ERC grants (2015-2024)



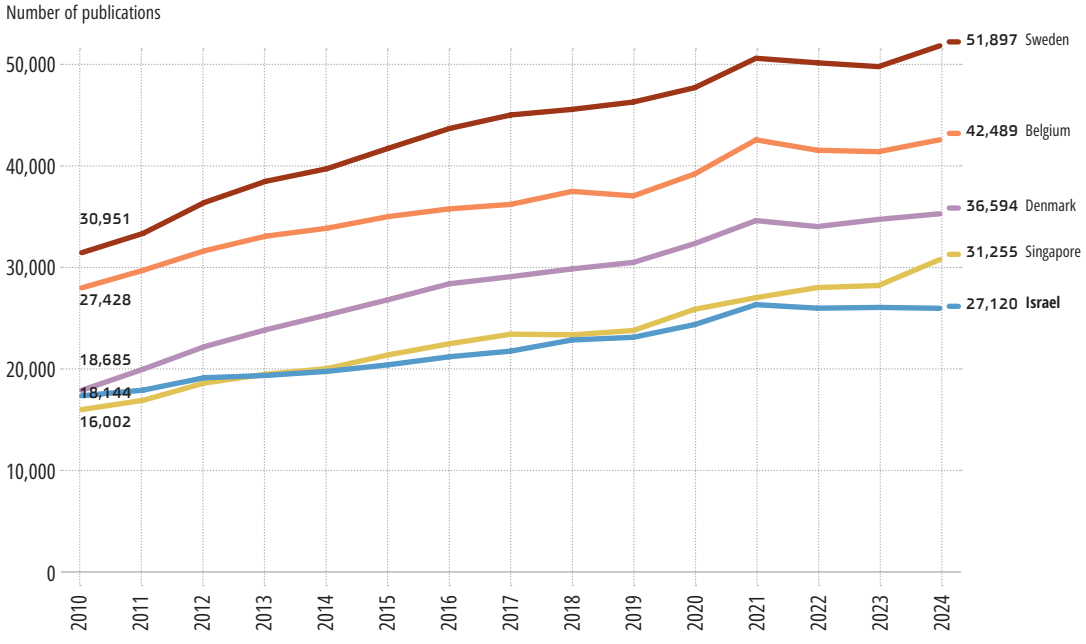
The prestigious ERC grants:

Israel ranks **1st**
In success rate (number of wins out of number of submissions)

Israel ranks **7th**
In total number of wins

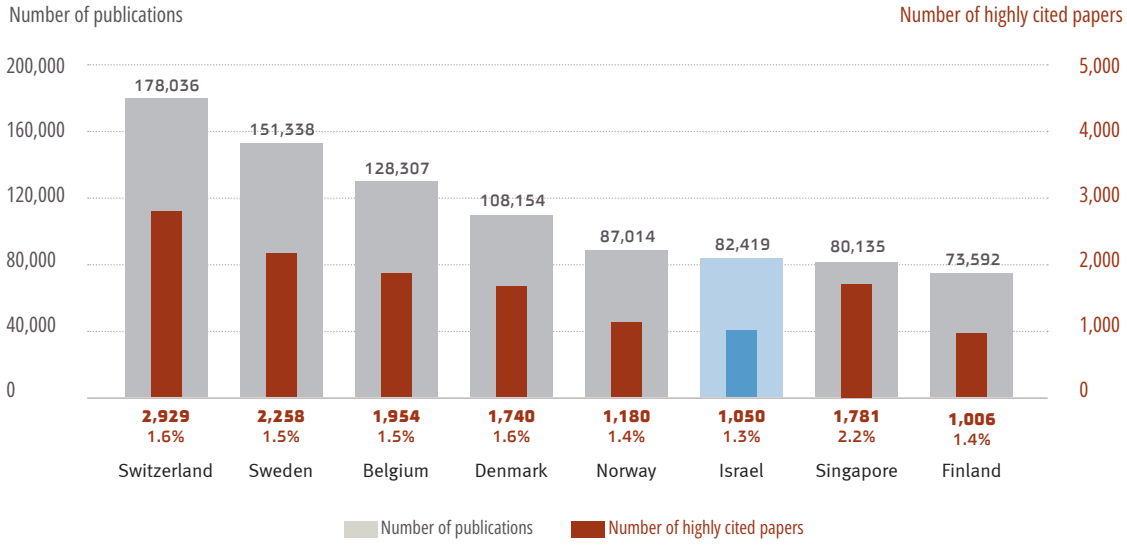
Source: ERC dashboard

Israeli scientific publications compared to reference countries (2010–2024)



Source: Scimago. Data retrieved April 2025. Processing by the Samuel Neaman Institute for the National Council for Research and Development

Highly cited papers by country: number and share of total publications (2020–2022)



Source: Scientific Publications – Bibliometrics (2023), National Council for Research and Development. Special processing by the Samuel Neaman Institute.

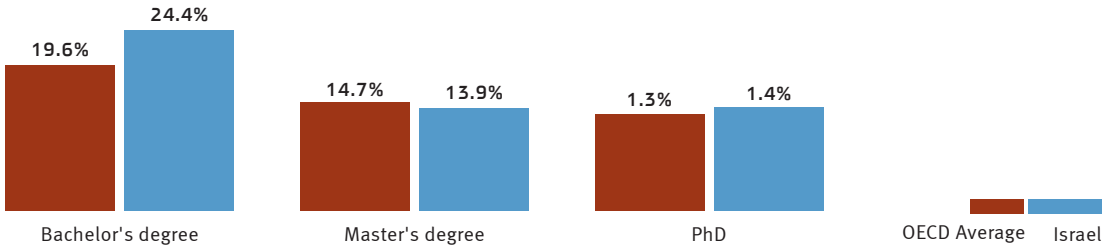
Research Workforce

In 2024, Israeli academia employed approximately 9,000 senior faculty members in full-time positions, with about one-third of these at colleges. The representation of women in academia gradually decreases as one advances along the academic track. Women form a majority among students earning advanced degrees, but a minority among senior faculty. **It is recommended to continue working to close the gender gap.**

The academic system is supported by approximately 3,000 postdoctoral fellows, of whom slightly more than half are international postdocs. Since the outbreak of the war, a worrying phenomenon has emerged that has affected the research activity of many laboratories: international postdoctoral fellows are leaving, and new ones are not arriving. **New programs are needed to attract them, as detailed in the chapter "International Research".**

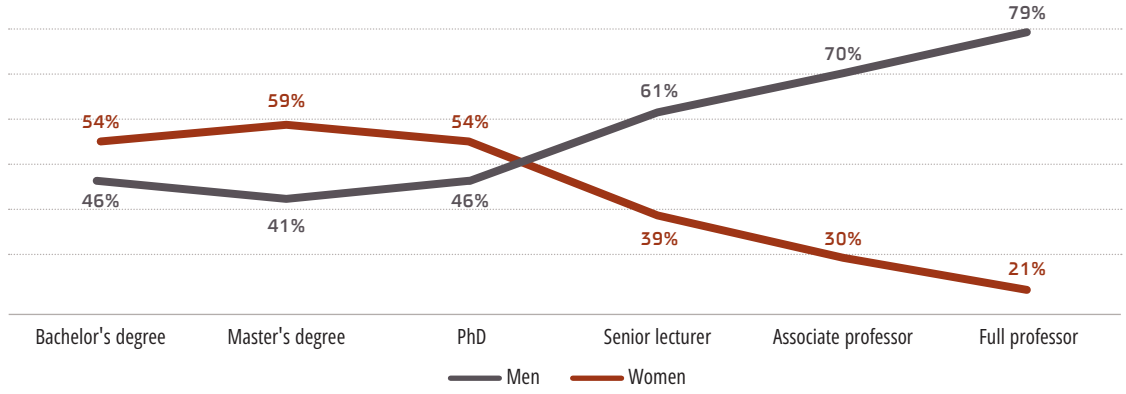
Staff scientists are another essential component of the academic research system. This group consists of research fellows with doctoral degrees or who have completed postdoctoral training, who work as part of senior faculty research groups but are not themselves members of the senior academic faculty. Staff scientists contribute significantly to the research work of laboratories, especially experimental ones. **It is recommended to establish clear guidelines for the professional status and career pathways of staff scientists in institutions of higher education.**

Educational attainment compared to OECD countries



Source: OECD MSTI Data

Gender distribution of university students and faculty at various career stages (2023/24)
Includes international and Israeli researchers and students



Source: Central Bureau of Statistics

Approximately 40%–50% of doctoral graduates in Israel pursue an academic career, while others integrate into the public and private sectors. Programs to strengthen connections between academia and the Israeli economy, mentioned in various chapters of this report, will enable high-level academic training for doctoral students interested in careers in Israeli economy, society, and industry.

The number of higher-education graduates has grown over the years: in 2023–2024, approximately 57,127 students received a bachelor's degree, 28,134 a master's degree, and 1,985 a doctoral degree. The growth in the number of master's degree graduates is particularly notable, reflecting a rising demand overall for advanced degrees. However, the share of the overall population pursuing a doctoral degree has remained constant.

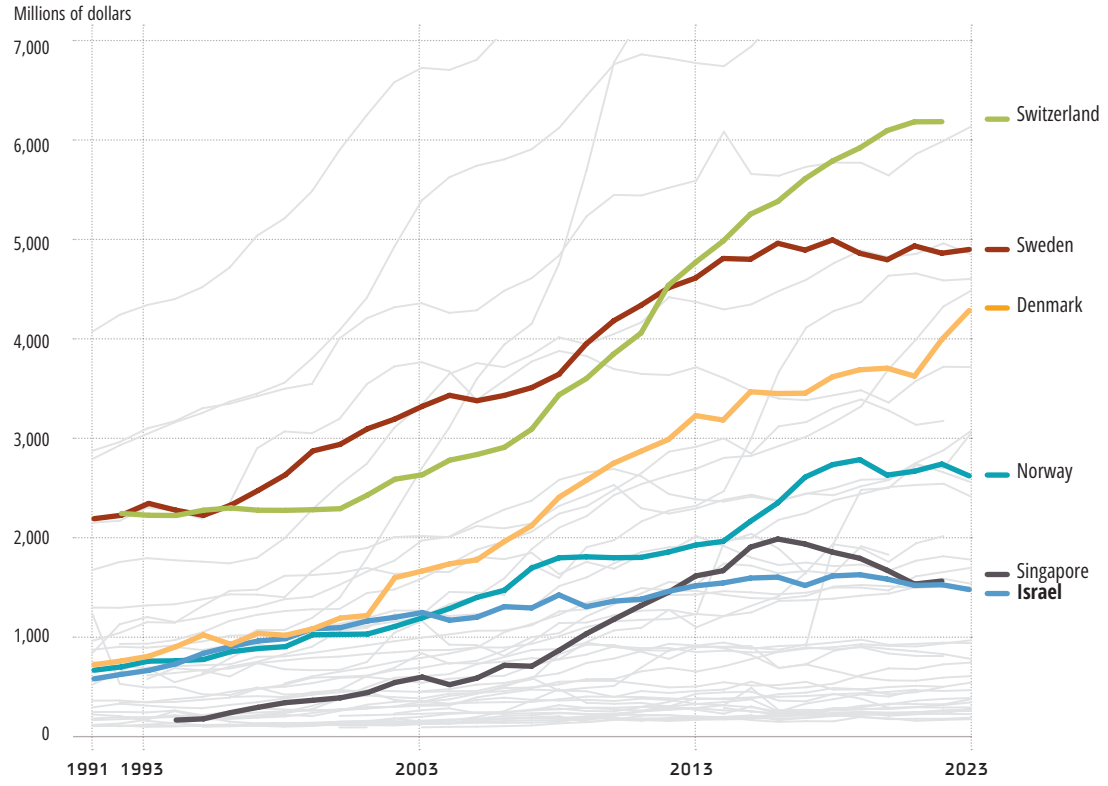
Approximately 51% of bachelor's degree students study at universities (16% of those at the Open University) and approximately 49% at academic colleges, including academic colleges

of education. At the master's level, most students – approximately 61% – study at universities and the rest at academic colleges. The distribution between universities and colleges is correlated with fields of study.

Funding for Academic Research

The worrying finding that emerges from the report is the continued decline in national investment in academic research. While Israel is considered a global leader in overall investment in *civilian* research and development, the share allocated to *academic* research has decreased by 4% over the past decade. This contrasts sharply with the trend in OECD countries, where investment in academic R&D has increased substantially. **A significant increase in national investment in basic research is required for Israel to maintain its leading position, let alone enhance it.**

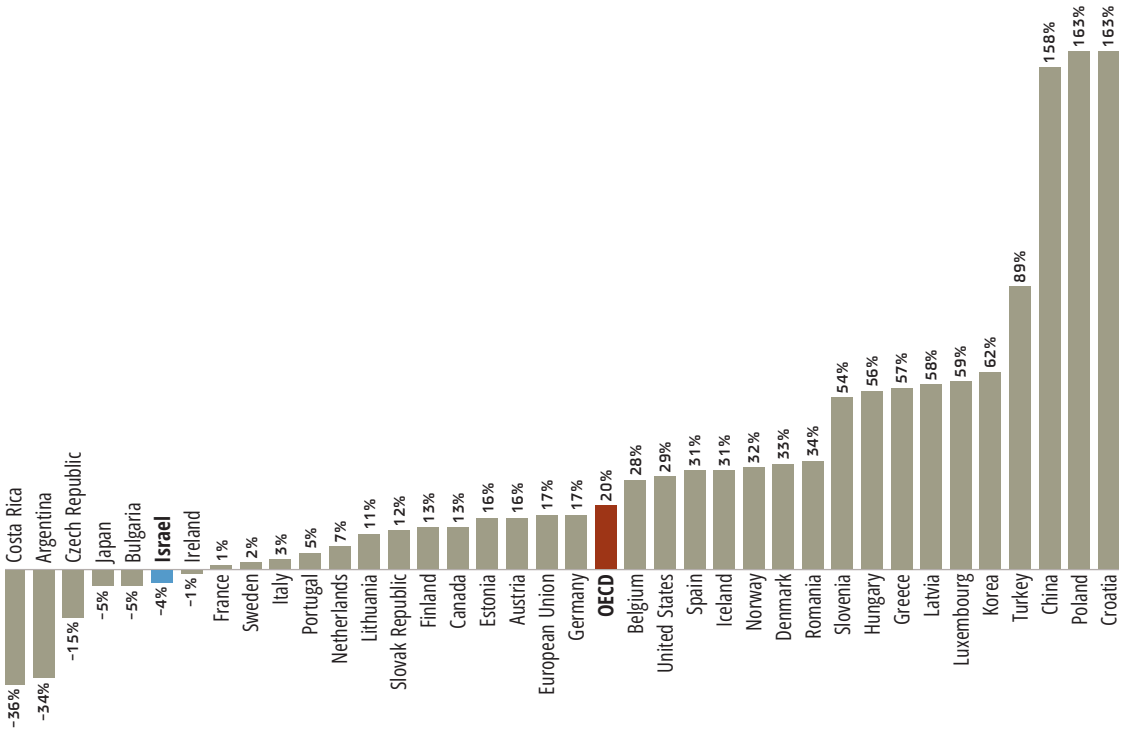
National investment in academic R&D (millions of dollars) in OECD countries at constant 2020 prices (1991–2023)



Source: OECD MSTI Data

The funding scope of the Israel Science Foundation, the main body funding basic research, has not decreased in the past three years; that is, the size and number of grants have not changed substantially. However, due to the sharp rise in research costs in recent years, especially in the exact sciences and the life sciences, the amounts provided in individual grants are insufficient to adequately fund advanced research. **Maintaining the ability to conduct groundbreaking research therefore requires substantially larger grant amounts, without reducing the number of grants provided.**

Rate of change in national investment in academic R&D in OECD countries (2014–2023) at constant 2020 prices



Source: OECD MSTI Data

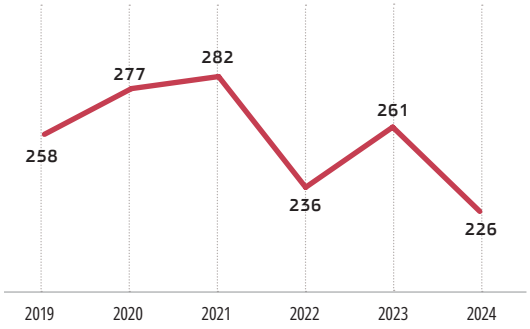
The Impact of the War on Research and Academia in Israel

The war that broke out on October 7, 2023, and continued for approximately two years, created a complex and difficult reality for Israeli academia. Global sentiment shifted from support and empathy for Israel to condemnation, resulting in Israel's isolation from the international community. The impacts of the war on science and research in Israel, at both the national and international levels, were examined in this report using a combined analysis of discussions in focus groups comprising faculty members at various stages of their careers, and of current university data. This analysis allowed for a comprehensive view of the effects that the war had on the state of research in Israel and the international aspects thereof.

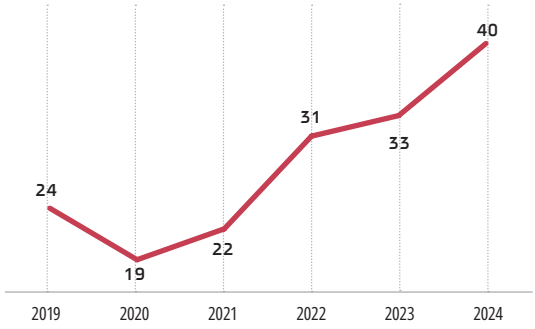
The Impact of the War on the State of Research in Israel. Beyond the difficulties in concentrating on research and scientific writing at a time of war, a slowdown emerged in research within research groups, which at times stopped their work altogether due to the absences of members called for lengthy reserve military duty. International postdoctoral fellows and graduate students left Israel following the outbreak of the war, and others chose not to arrive, thereby harming the composition and size of research groups at the universities – which is expected to affect research outputs. The burden on senior faculty increased as members were required to adapt their instruction for students called into military service. Some senior faculty members left Israel or extended their sabbaticals, while the recruitment of new faculty members declined. Raising additional concern, emigration of senior faculty, albeit few in number, are concentrated in unique research fields that represent key strengths of Israeli academia. Some academic institutions were damaged by ballistic missile strikes, and valuable research materials were destroyed. These negative impacts too will have far-reaching implications for research outputs.

The Impact of the War on the International Aspects of Research. Growing anti-Israeli sentiments around the world following the war have led to academic boycotts, both explicit and tacit, and have caused international activity to be reduced or canceled altogether. Thus, for example, most international conferences scheduled to take place in Israel in the 2024–2025 academic year were canceled; there was a noticeable decline in invitations sent out to Israeli researchers to attend conferences and seminars abroad; and reports were received of difficulty in publishing articles and of exclusion, or attempts at exclusion, of Israeli researchers from applying for international research grants. These phenomena damage the international exposure of Israeli research groups and obstruct the creation of new international connections.

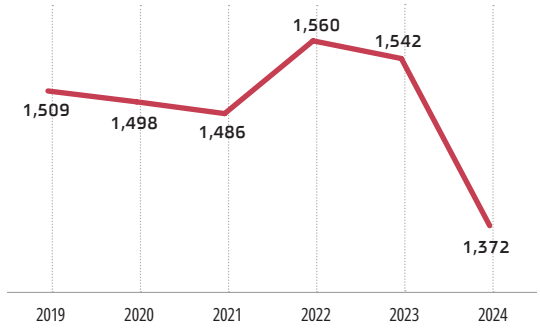
Israeli faculty hired for tenure-track positions at Israeli institutions



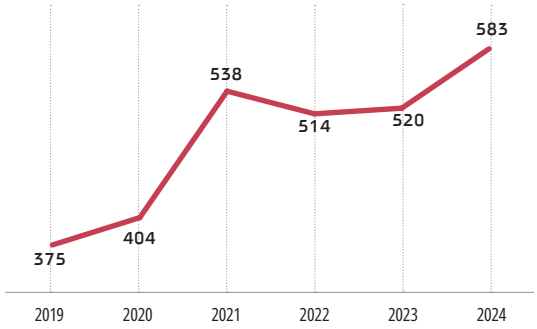
Faculty members who left their institution or took unpaid leave to go abroad



Number of international postdoctoral fellows



Declined or unanswered requests for letters of recommendation for professional advancement



Source: University reports, January 2025

The discussions the committee held in the focus groups provided two major indications. Among senior faculty, early-career, non-tenured researchers across all disciplines reported significant negative impacts, particularly on their ability to develop international networks with colleagues abroad. Second, researchers from the humanities and social sciences were particularly affected, regardless of their specific career stage within senior faculty positions.

It is hard to assess at this stage how these events will impact overall scientific activity in the coming years, both in the short and the long term. It is quite possible that the current impact will prove to be only the tip of the iceberg, and that the situation will grow worse. **At the institutional level, immediate intervention is therefore required to reduce the gaps created in research progress at the universities, especially among early-career, non-tenured faculty members.**

At the beginning of 2025, the steering committee of the Report on the State of Science approached the heads of Israel's universities to draw their attention to these findings and propose steps for mitigating them. These steps included offering extensions for submitting tenure files, relief from teaching obligations, and budgetary assistance for scholarships and conferences. As for the international aspects of the war's effects, some of the damage may abate once security threats are decreased with the conclusion of the war, but other damage may persist, owing to the intensifying boycott. The universities have invested, and continue to invest, considerable efforts and resources in dealing with the harm to their regular operations and with both the institutional and personal impacts of international isolation. More experienced faculty members have argued that the international standing of Israeli academia enjoys a certain resilience that has built up over the years, and maintain that existing personal connections will therefore continue to serve as a bridge for preserving collaborations even in dire times. However, toward the summer of 2025, and in light of the continuation of the war and the geopolitical situation, they too have been expressing concerns about potentially severe longer-term damage to Israeli academia.

International Research

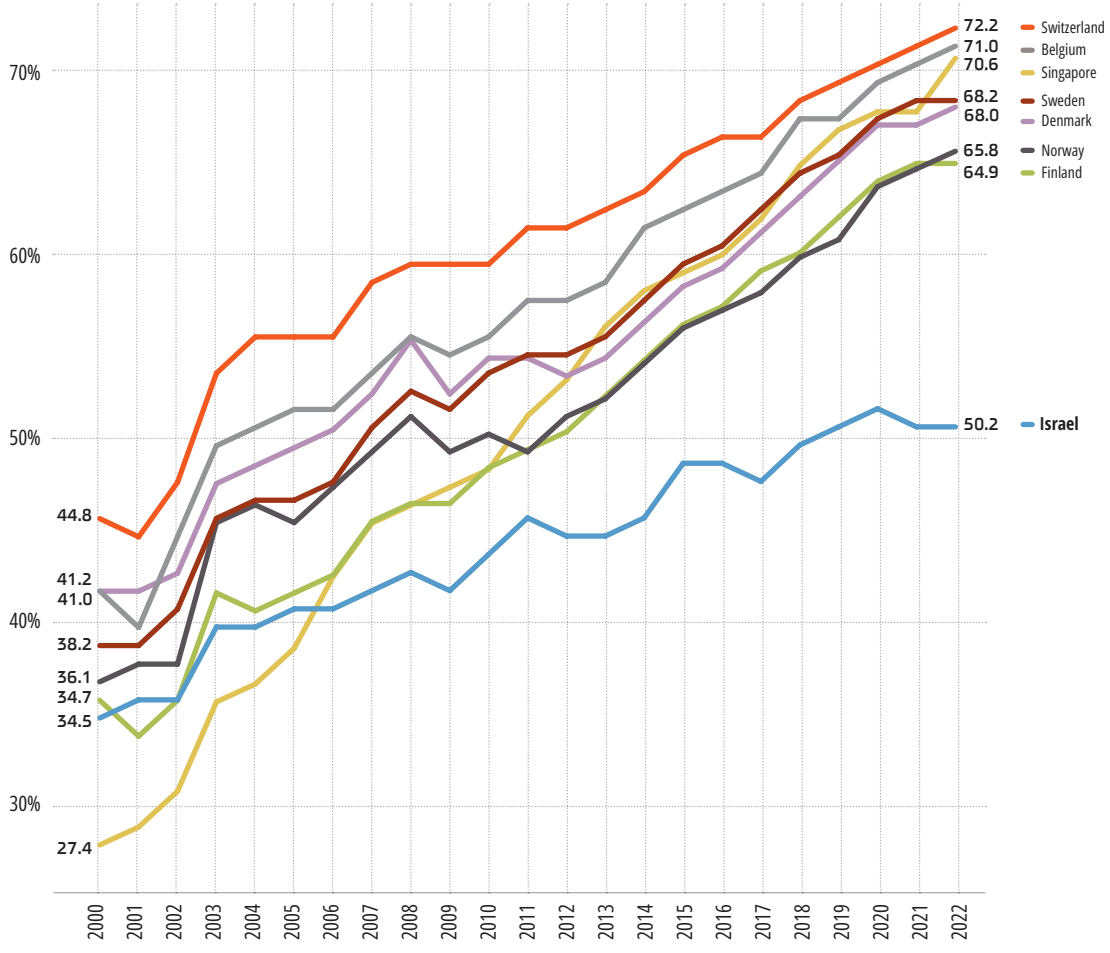
International research collaborations are an essential component of advancing science and knowledge. They allow Israel to preserve and enhance its research excellence, despite its own relatively small size. Until 2024, Israeli scholars recorded impressive successes in winning prestigious ERC grants within the framework of the European Commission's Horizon Europe program – a good measure of Israel's scientific excellence. However, in the past decade, Israeli researchers co-authored only about half of their scientific publications with international partners, a figure that is low when compared with Israel's reference group (similar countries in terms of demographic and physical size that boast high scientific intensity). The comparison with this group also indicates a relatively small number of Israeli articles ranked in the top percentile of the most cited articles worldwide, which can be attributed to limited international collaboration.

Recent events, first and foremost the two-year war (see further review in the chapter titled "Impact of the War"), have brought about a dramatic change in Israel's standing in the global arena. This has been manifested in academic boycotts, the departure of international faculty and students, cancellation of international conferences, threats to remove Israel from the Horizon Europe grants program, and more. Countering these trends requires two complementary strategies: first, strengthening the research excellence of the next generation of researchers to build national resilience and reinforce Israeli academia's ability to weather crises; second, devising new ways to circumvent the limitations imposed by boycotts and bolster international collaboration.

To advance these strategies, it is recommended to act through two channels. First, **a new excellence fellowship fund should be set up to support the development of the next generation of faculty members at Israel's research universities**. This fund should provide fellowships large enough to enable outstanding doctoral graduates to train at the best academic institutions in the world. Developing the next generation of researchers at Israeli universities depends largely on the ability of outstanding doctoral graduates to specialize at leading international institutions. Upon completing their postdoctoral training, these researchers will be able to compete for positions at Israeli universities and return home with knowledge, experience, and international connections that would help raise the level of

research in Israeli academia. Second, **a comprehensive support system should be created for all Israeli postdoctoral fellows abroad to bring the most outstanding among them back to universities in Israel**. A first step in this direction was made last year with the launch of the "Bereshit" program, which allows for the recruitment of outstanding researchers under improved funding conditions. (The program was established through Government Resolution No. 1294, creating a cooperation between the Ministry of Finance, VATAT, and the Ministry of Aliyah and Integration.)

Share of publications written by Israeli researchers in collaboration with researchers from other countries, compared to reference countries (2000–2022)

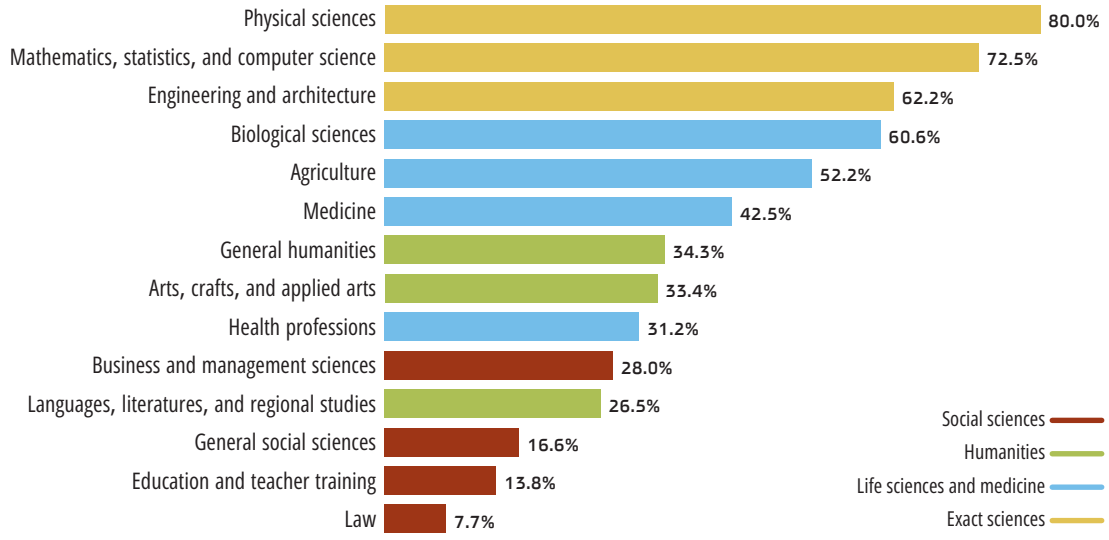


Source: Scientific Publications – Bibliometrics (2023), National Council for Research and Development. Special processing by the Samuel Neaman Institute

The second channel should focus on **broadening international research collaborations**. Signing cooperation agreements between national science foundations within the framework of the LAP (Lead Agency Process), managed by the Israel Science Foundation, is an excellent approach that should be continued and expanded to encourage research collaboration with leading scientific nations. It is also recommended to **increase Israel's share of participation in consortia within the European Commission's Horizon Europe**, which facilitates international collaborations. **A professional support infrastructure should be established** to encourage participation in consortia and help with coordinating them, which often requires extensive administrative work.

The proportion of international senior faculty members at universities in Israel is low (less than 3%), and the war has caused a further decline in their number. Several approaches have been proposed to address this challenge (some have already been implemented), first and foremost the recruitment of outstanding senior researchers from universities abroad. Indeed, following Government Resolution No. 1294, the "Or" program was launched in 2025, managed by the Israel Science Foundation. The purpose of the program is to recruit outstanding senior scientists from prestigious institutions abroad, primarily immigrants and returning residents, as tenured senior faculty members at Israeli universities. At the same time, it was proposed to **develop new institutional frameworks for bringing senior researchers from abroad to Israel for periods of several weeks**, either as individual researchers or with their research groups, to work in laboratories or teach intensive courses of one to two weeks at universities. These proposals are meant to address international scientists' current reluctance to stay in Israel for extended periods. In addition, it was recommended to consider allocating budgets from the institutions or the state **to fund sabbaticals or half-sabbaticals at Israeli universities for first-rate international researchers** and **to create a comprehensive administrative framework that will make it easier for them and their families to acclimate to life in Israel**.

Share of international postdocs among total postdocs in Israel by field (2023)



Source: Central Bureau of Statistics

Postdoctoral fellows are the beating heart of academic research, especially in the experimental natural sciences, and their arrival from abroad can help increase research output and foster a multicultural research environment. Many postdoctoral fellows left Israel or canceled their arrival due to the war, and it is therefore recommended **to restore the national support programs for fellowships for international postdoctoral fellows**, which have been reduced recently. It is also recommended **to establish a fellowship program based on joint supervision by an Israeli and an international faculty member**. Such a program would enable postdoctoral fellows from abroad to stay in Israel while maintaining their affiliation with their home institution. At the same time, academic ties with institutions in Central and Eastern Europe should be strengthened to launch new collaborative programs. It is also recommended **to revive the "sandwich" program**, in which doctoral students from institutions around the world come to study in Israel for a year, and **to develop joint programs for advanced degrees with leading institutions abroad** by reforming the existing accreditation system.

Research Infrastructure in Israel

Advanced research infrastructure is vital for Israeli academia's ability to conduct competitive and groundbreaking research to global standards and reinforce its standing as a leading scientific center. It is also critically important for training the next generation of scientists and for enabling them to gain practical experience with cutting-edge technologies. Investment in research infrastructure is not only an academic necessity, but a national strategic asset required to ensure the continuity of Israeli scientific excellence.

Research infrastructure can be classified into four categories: personal, institutional, national, and international. At the personal level, it was found that while sufficient budgets exist to provide research infrastructure for faculty members in the early stages of their careers, budgets for mid-career faculty are inadequate. It is recommended **to expand the scope of the existing program to benefit mid-career researchers**, whose research equipment has become outdated and who lack sufficient funding to replace it.

Impressive achievements were made through **VATAT's programs for institutional infrastructure development** (initiated in 2018), **which should be maintained and expanded**. It is crucially important, for example, to maintain support for infrastructure related to VATAT's flagship program for quantum science and technologies – strategic assets that could transform Israel's scientific capabilities and excellence in the international arena. To amplify the programs' success, it is recommended to re-evaluate the requirement that academic institutions provide 25% matching funding, especially for large projects. It is also recommended **to ensure funding for professional personnel to operate and maintain this infrastructure and thereby increase its research potential**. At the same time, **a program should be developed to fund the unique infrastructure needs of the humanities**, including language studies, libraries, and digital databases – as further elaborated in the "Humanities" chapter of this report.

Nationally, **there is an urgent need to develop advanced computing infrastructure for artificial intelligence (AI), including a national supercomputer exclusively designated for academic research and for training quality human capital in the field**. Currently, there are significant deficiencies in computing infrastructure for AI in Israel, and the supercomputer expected to be built with government funding by 2026 is intended to serve all users, not

just those in academic research. This is a critical issue: a comprehensive study conducted by the Association of University Heads (VERA) determined that building a supercomputer exclusively dedicated to the needs of academia is a necessary condition for Israel's ability to lead AI innovation and to stand at the forefront of its global research. The Jacob Nagel Committee, appointed by the government to examine the need to accelerate AI research, adopted VERA's conclusions and even recommended increasing investment in academic research and allocating approximately 50% of newly-developed national infrastructure to the needs of academia. The Nagel Committee emphasized that accelerating development in the field of AI is not simply an academic need related to Israeli innovation and economic growth, but a cornerstone of Israel's national power and international standing in the 21st century.[1]

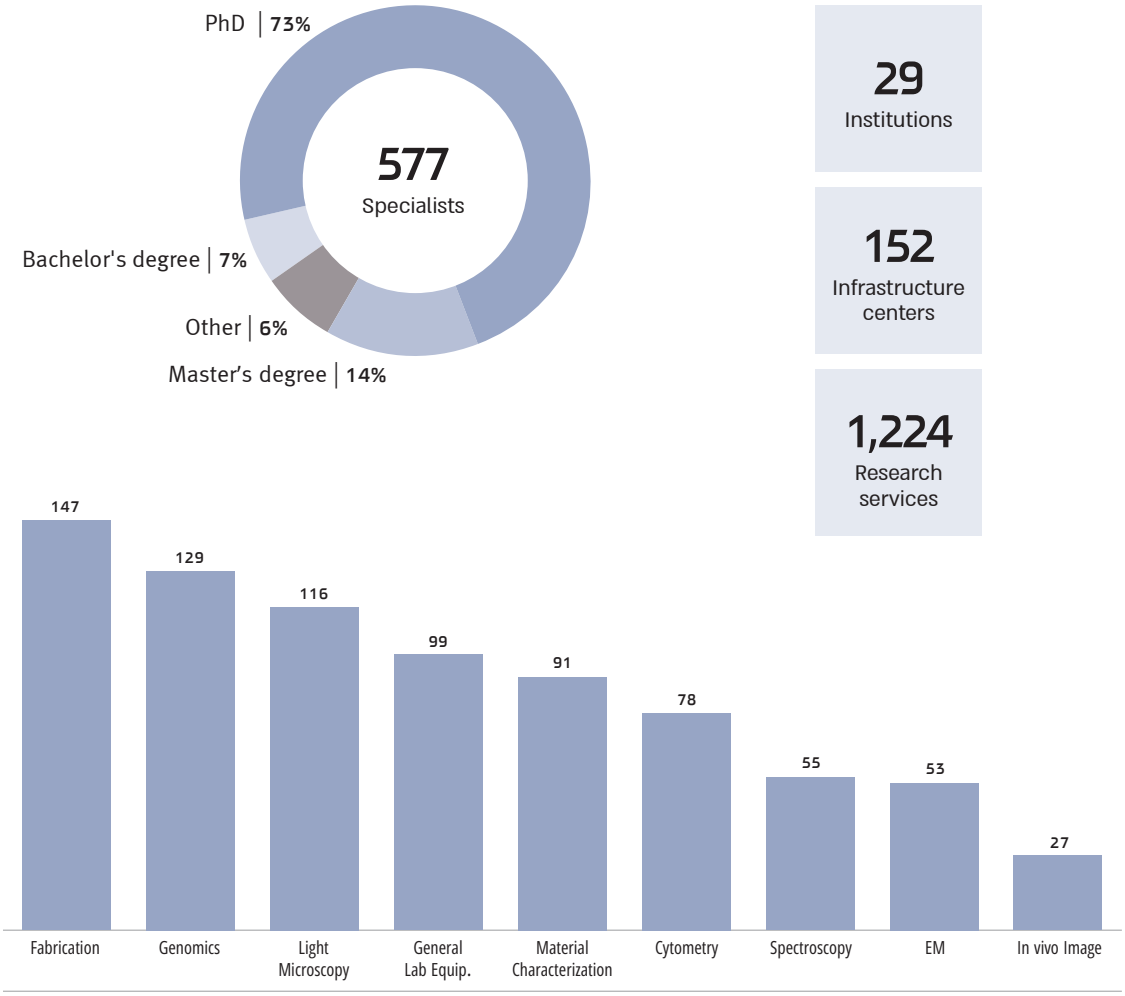
The destruction caused by the war to dozens of research laboratories, their equipment and materials, and the unique biological, clinical, and chemical samples they accumulated, highlighted the need **to establish a national biorepository and backup center for preserving these strategic research assets.**

At the international level, in light of the ongoing war and the academic boycott of Israel, it is particularly important to maintain partnerships in international research infrastructure centers. **All of Israel's international commitments must be upheld, and efforts must be made to expand access to additional international research infrastructure**. Israel must continue to actively support joining research initiatives and major infrastructure programs around the world and allocate budgets to cover the associated costs.

Owing to the high cost associated with the development and technical maintenance of research infrastructure in Israel, it is imperative to optimize usage of existing research infrastructure. As a first step, about three years ago a database that maps Israel's research infrastructure was established (IRCF – Israel Research Core Facilities), initially funded by the Ministry of Innovation, Science and Technology and at present funded by VATAT. The center currently includes in its database approximately 80% of the main research infrastructure at Israel's universities, colleges, hospitals, and government research institutes. The center still faces challenges relating to expanding its mapping of all infrastructure in the country, including in the civilian and defense industries; creating an efficient system for updating the database; and increasing awareness of the IRCF among research communities in academia and industry. As a second step, **it is recommended to formalize inter-institutional access to infrastructure using uniform framework agreements, simple payment mechanisms, and subsidization of excess costs**. This will encourage sharing of existing resources and their efficient utilization. Efforts to establish such a mechanism were launched last year and should be monitored to ensure effectiveness.

1 Report of the National Committee for Accelerating the Field of Artificial Intelligence, headed by Prof. Jacob Nagel (August 2025).

IRCF in numbers: Infrastructure centers mapped by field and services, specialists engaged in infrastructure maintenance, and their educational level



Sharing research infrastructure is important, as mentioned, considering the substantial costs of development, maintenance, and insurance. Equally important is ongoing investment in professional personnel (with doctoral degrees) who specialize in the operation and maintenance of such infrastructure and scientific equipment and who are actively engaged in the research activities conducted. **It is recommended to provide for the employment conditions of such personnel, similar to the provision made for staff scientists.** Ongoing professional development for this staff should also be ensured, building on IRCF's existing training programs.

Humanities

The humanities (philosophy, history, literature, etc.) are a foundational element of human culture and key to building a civil society that encourages independent thought and personal and collective accountability. A radical transformation has transpired over the years: scientific and technological progress has created a preference for STEM fields (Science, Technology, Engineering, and Mathematics), marginalizing the humanities. The "Crisis of the Humanities" as a worldwide phenomenon is manifested in a decline in prestige, number of students, and budgets for these disciplines. The data suggest, however, that in contrast to the bachelor's degree, where student numbers have indeed been declining, the number of doctoral graduates in the humanities has been stable. The crisis discourse has generally focused on teaching (i.e., student numbers) rather than research. This report aims to correct this bias and to highlight the research aspect of the humanities. It provides a qualitative assessment of the state of humanities research, examining the relative standing of Israeli humanities both domestically and internationally, with philosophy and archaeology serving as exemplars of research excellence.

As with other fields of science, the nature and development of research in the humanities are substantially shaped by funding and budgeting structures, by infrastructure supporting research, and by promotion processes and quality metrics. The report examines three factors that may adversely affect the conduct and quality of research: the use of quantitative metrics for evaluating excellence in promotion and research grant decisions; the nature and duration of the training track for advanced degrees; and the financial reward mechanisms used for allocating research budgets.

The funding and budgeting structure is based on using quantitative bibliometric metrics, such as number of publications and citations and journal rankings, to evaluate research excellence, rather than on direct, peer evaluation of research content. Content-agnostic metrics are widespread throughout the academic establishment (see the chapter "Exact Sciences"), but their use poses unique difficulties in the humanities – because they are derived from other scientific disciplines and are incompatible with the distinctive working methods in the humanities. Ranking journals based on citation count ignores the fact that there are fewer journals in the humanities, and that it often takes years for articles or books to accumulate citations. This longer research timeline leads less frequently cited fields to

be wrongly labeled as esoteric or obsolete – even when they provide essential foundations for research in more mainstream areas. The current metrics are also deeply problematic for research published in languages other than English, since journals in other languages are almost never ranked, and their citations are rarely counted. This creates an escalating vicious circle that damages local academic culture. Furthermore, this budgeting model pushes researchers to publish articles rather than books, even though books are a central research tool in the humanities, as they enable the synthesis of research results into broader pictures of long-term processes. This budgeting practice may cause the elimination of the humanities' unique research culture and encourage an academic culture that prefers broad but superficial theses to focused, in-depth research.

The short training track established by the Bologna Process (an agreement among European universities for mutual recognition of curricula and academic degrees) does not allow research students in the humanities to develop independent research or to acquire the necessary tools for such research. The pressure on the humanities to adapt to the current budgeting model is already eroding the research culture across their various disciplines. Whereas past doctoral dissertations were generally impressive and mature works, today's students are pushed to choose narrower topics whose study can be completed relatively quickly, postponing more extensive research to the postdoctoral stage or beyond. Encouraging students to write dissertations on narrower topics that form segments of work carried out by senior researchers is motivated by legitimate considerations of efficiency and budgeting, but threatens to dramatically undermine the unique research culture of the humanities.

Similarly, the financial reward mechanisms for obtaining research funding encourage practices that may eliminate unique aspects of the humanities that should actually be cultivated. For example, the drive to win ERC grants encourages collaboration in research groups. While this practice can certainly have positive outcomes, the need to coalesce around a single research topic may erode the traditional independence of doctoral research. To avoid this outcome, **it is recommended to recalibrate the evaluation model, the nature of doctorates, and the funding mechanisms so that they combine direct qualitative assessment with an adjusted quantitative evaluation, that acknowledges the distinctive research methods of the humanities**.

The humanities also have unique needs regarding research infrastructure. Urgent systemic attention is needed in three main infrastructure areas in the humanities: most importantly in language instruction, which serves as vital research infrastructure for the humanities and is in a state of ongoing deterioration. Research in most fields of the humanities is based on primary sources in various languages, and training researchers therefore requires proficiency

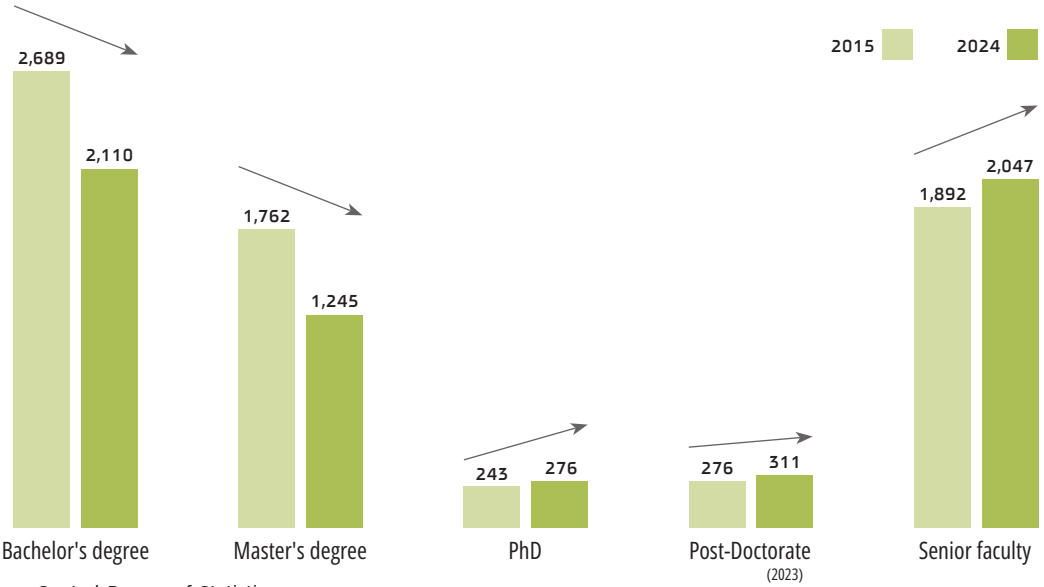
in the relevant source languages. Building a comprehensive language infrastructure demands substantial investment, systemic planning, and inter-university collaboration. **A national framework should therefore be developed to ensure the availability of training in the diverse languages required for research.**

Another area requiring attention is libraries, including the National Library, university libraries, research institute libraries, and archives – which serve as the primary research infrastructure in the humanities. **It is recommended that the National Library and research institutes promote coordinated national planning of collection policies to fill gaps and avoid unnecessary overlap.**

The third infrastructure area requiring attention is digitization and databases, which provide researchers in the humanities with access to primary sources from anywhere. The use of digital tools, or "the digital humanities", as it is often called, is expanding rapidly, and the use of AI is expected to have a substantial impact on research. However, digitization suffers from a lack of coordination between different initiatives, with each research project managed independently, and sub-optimal sharing of results. **It is recommended to advance the establishment of a national center to consolidate digitization efforts, develop infrastructure, and make research outputs accessible to the entire academic community.**

The proposed solutions focus on coordinated national inter-university planning that includes pooling resources and sharing infrastructure, with adjustments tailored to the humanities' distinctive needs and contributions to Israeli academic research.

Number of university graduates and faculty



Source: Central Bureau of Statistics

Social Sciences

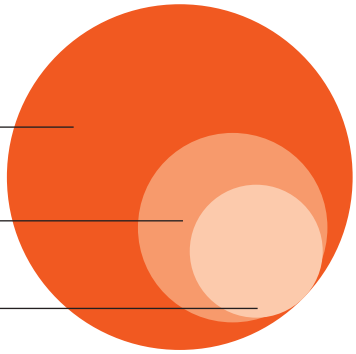
The social sciences include numerous disciplines, among them economics, psychology, sociology, communication, public policy, political science, law, business administration, social work, and education. Their aim is understanding human society and the individuals it comprises, and a substantial portion of research in their various fields addresses questions that are of great concern to the Israeli public and decision-makers alike. The social sciences are a central pillar of Israel's higher education system. Nevertheless, despite their considerable contributions and achievements, they show unrealized potential both in basic science and in its applications, including for local social issues.

In 2024:

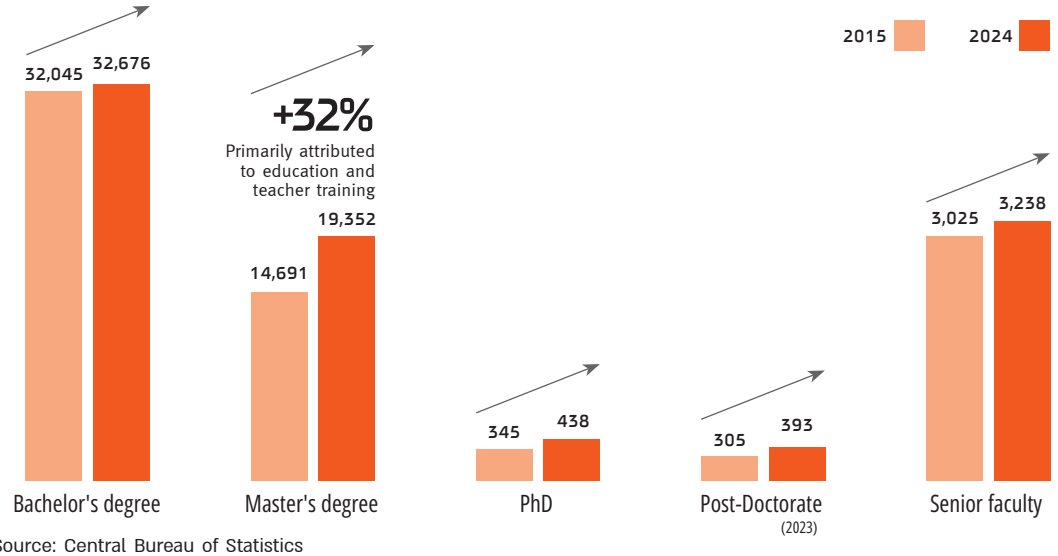
10,790
Total number of senior faculty at Israeli universities

3,238
Total number of senior faculty in the social sciences

1,600
Senior faculty at academic colleges



Number of university graduates and faculty



Source: Central Bureau of Statistics

This report examined the state of the social sciences in Israel from the perspective of incentives and motivations, and asked whether the forces operating in the field – the Planning and Budgeting Committee (VATAT), university administrations, funding agencies, and the researchers themselves – are aligned in their pursuit of research excellence. The report identified several clear cases of misalignment that undermine both the fulfillment of research potential and the realization of its possible societal benefits. Three main areas were examined. The first is the suboptimal reward for research outputs, stemming from the fact that VATAT's current budgeting model prioritizes winning research grants over scientific publications, thus incentivizing resource-intensive research and even scientifically unjustified expensive research proposals. This structural bias exerts constant pressure on universities to require that social science departments increase the number of undergraduate and graduate students (to compensate for modest research grant income through higher tuition-based revenue), and to favor hiring researchers engaged in resource-intensive empirical research.

The second area examined in the report is maximizing the research potential of colleges. There is concern that this potential is not being fully realized, partly due to VATAT's funding model for colleges, which is based almost entirely on student numbers rather than on research outputs, and therefore discourages colleges from promoting faculty research. This incentive structure likely contributes to the relatively low research output from colleges. It also hinders the advancement of senior faculty, who must still meet research output criteria for promotion.

The third area discussed is the contribution of academic research to society. While the current academic system, which rewards international visibility, publication in international journals, and winning international and basic-science research grants, has certainly contributed to establishing the international standing of Israeli research in the social sciences, it has also discouraged researchers from tackling issues that are relevant to Israeli society. Investing time and effort in activities that directly contribute to Israeli society – whether designing and evaluating research-based social policies or training professional personnel for public service – holds no rewards in terms of academic promotion, and may even hurt it (since such work diverts precious resources from other scientific pursuits).

Realigning incentives and motivations can greatly increase research outputs without additional funding by changing the forces operating within the academic field. **It is therefore proposed to modify VATAT's budgeting model to increase the weight given to high-quality publications, reduce the weight given to securing external research funding, and reward prestigious research grant awards regardless of their size.**

As for strengthening research in colleges, **it is recommended to consider creating, alongside the existing student (tuition-based) model, a new model that would reward select colleges for their academic research excellence**. It is further recommended to encourage collaboration between colleges and universities, for example by **establishing joint research–institutes and funding joint conferences**. Above all, **colleges should be encouraged to develop local applied research**, which would allow them to better pursue important research directions unique to their geographic location.

To encourage contribution to society without undercutting the international aspects of research or its quality, **it is recommended to expand the circle of "knowledge transfer" foundations, which are given preference in VATAT's model. This expansion should include foundations run by government ministries relevant to the social sciences**, such as the Ministries of Education, Welfare, Justice, and Health. Additionally, **special recognition may be given to articles addressing Israeli society** published in respected journals. **It is recommended to establish an academic committee to examine different ways of measuring the societal contribution of research in the social sciences** and then to reward such research, particularly in social policy design and in training public sector professionals. Importantly, this should be done without compromising the academic level or international standing of research in the social sciences.

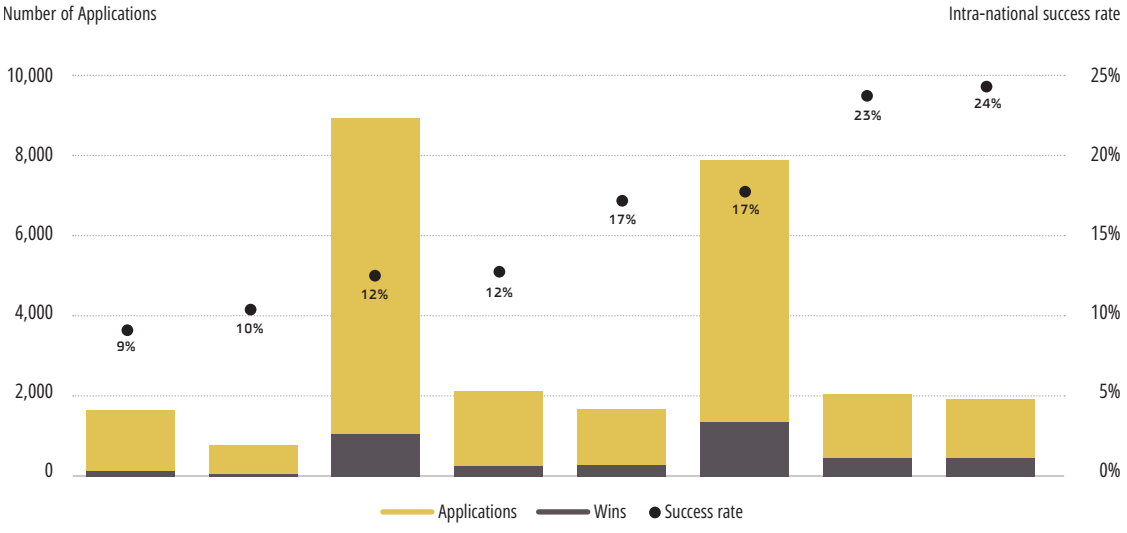
Finally, it is proposed to examine the need for **a new competitive foundation for applied research that would operate in parallel to the Israel Science Foundation and provide a more comprehensive response to the distinctive needs of applied research in the social sciences**.

Exact Sciences

The exact sciences comprise a broad range of disciplines, including mathematics, computer science, physics, chemistry, and various engineering specialties. Israel's leading position in these fields has solidified over the years and is constantly replenished with young scholars joining the scientific community. Israeli researchers have won Nobel Prizes, the Turing Award, the Abel prize, the Wolf prize, and the Fields Medal, and continue to hold leading positions in the international scientific arena. Israel's leading position is also demonstrated by publications in international journals, participation in leading conferences, exceptional success in winning ERC grants, and its consistent contribution to global innovation.

Despite these notable achievements, the security and societal events of recent years, particularly the ongoing war, have not spared the exact sciences community, especially given its critical dependence on top-quality human capital. The negative impact of these events can be seen at several levels: a decline in the arrival of postdoctoral fellows and international students to Israel; difficulty in recruiting researchers from abroad; and the departure of leading Israeli researchers to academic institutions overseas.

Applications, wins, and Israel's success rate in securing ERC grants in the exact sciences compared to reference countries (2007–2024).



Source: ERC dashboard

Maintaining high-quality human capital for advancing research is always a top priority in the exact sciences, given the relentless competition between academia and industry for outstanding students. This report proposes two main avenues for achieving this goal. The first is redefining the concept of academic excellence by using content-based excellence metrics, and by acting in accordance with the international DORA initiative (Declaration on Research Assessment) – which aims to address the difficulty in evaluating research quality. Currently, the evaluation of both research and researcher quality is often reduced to examining quantitative metrics: number of publications, citation index, and impact factor. These measurement tools assess narrow aspects of excellence that sometimes have only an indirect, or even biased, relationship with the quality of either researcher or research. **It is therefore recommended to integrate DORA principles in all relevant processes: in appointment committees of academic institutions, in evaluation committees for research proposals and awards, and in the budgeting mechanisms of the higher education system.** Signing the DORA declaration is an important symbolic step, as its adoption and the implementation of its principles may help recruit and promote the most outstanding researchers.

The second proposed avenue focuses on the relationship between academia and industry. Here too, two issues were examined: one concerns ways to attract quality human capital to academia, and the other, ways to streamline institutional procedures for researchers hoping to commercialize ideas generated through their research.

Outstanding students and researchers are naturally drawn to employment in the knowledge-intensive industry, which offers salaries and incentives that are difficult to compete with, alongside advanced research infrastructure that often rivals or surpasses that of academia in intellectual and technological appeal. Some students are drawn to industry as early as the undergraduate level, and so their training may be impaired or halted at an early stage, reducing the likelihood that they will continue to advanced degrees. This dynamic is particularly evident in fields such as quantum technologies and AI, where academia is losing a growing number of outstanding students. Over the long term, this threatens both the quality of academic research and the generation of basic ideas needed to fuel future industries.

70%
of bachelor's degree holders go on to attain a master's degree in the physical sciences.

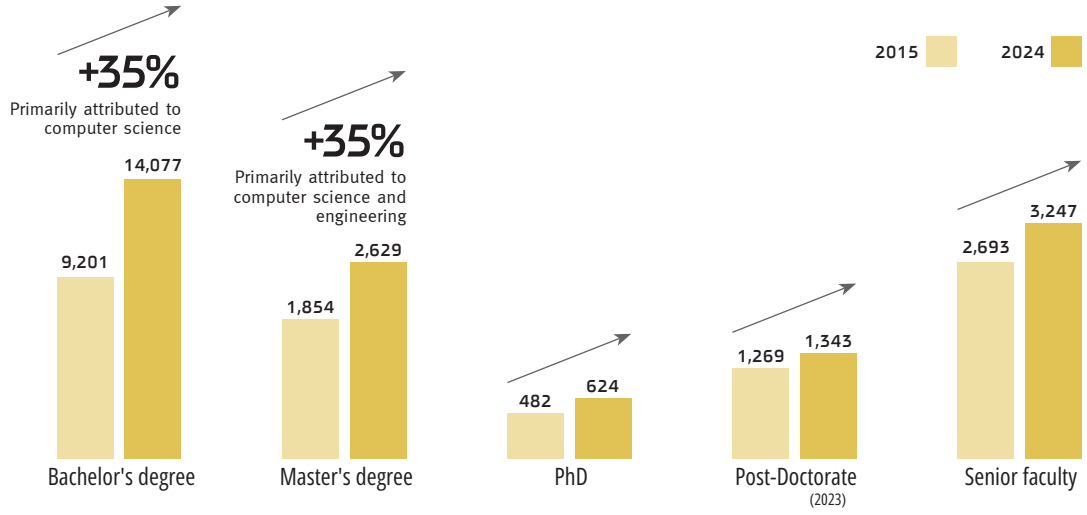
62%
of bachelor's degree holders go on to attain a master's degree in the biological sciences.

Only
27%
of bachelor's degree holders go on to attain a master's degree in mathematics, statistics, computer science, and engineering.

Addressing the pull toward industry, for students as well as for senior researchers, requires **rethinking the interface between academia and industry and adapting structures, incentives, and career tracks to the changing technological and economic reality**. Fellowship structures and financial support systems for research students must be updated to create more flexible models that allow students to combine work in industry with advanced studies. **It is recommended to develop closer collaborations between academia and industry and to create more flexible models for employing faculty members** – for example, by offering combined part-time positions, "reverse sabbaticals" (a researcher from industry taking a sabbatical year in academia), joint teaching, joint student supervision, structured unpaid leave arrangements for bidirectional movement between industry and academia, and flexibility in time commitments to the institution. Such models would help retain talent in academia while also bringing industry knowledge into it.

Another aspect of reexamining the relationship between academia and industry concerns improving the work of university technology transfer companies, which serve as a bridge between basic research and commercial applications. **A conceptual shift is needed in redefining the goals of technology transfer companies, where, alongside economic profitability, societal contribution should also be seen as a central objective.** This redefined approach will streamline the companies' work alongside researchers. Moreover, several academic institutions have already created dedicated roles aimed at cultivating and deepening connections between academic research and industry. It has been found that **creating technology incubators within academic institutions** allows researchers to realize

Number of university graduates and faculty



Source: Central Bureau of Statistics

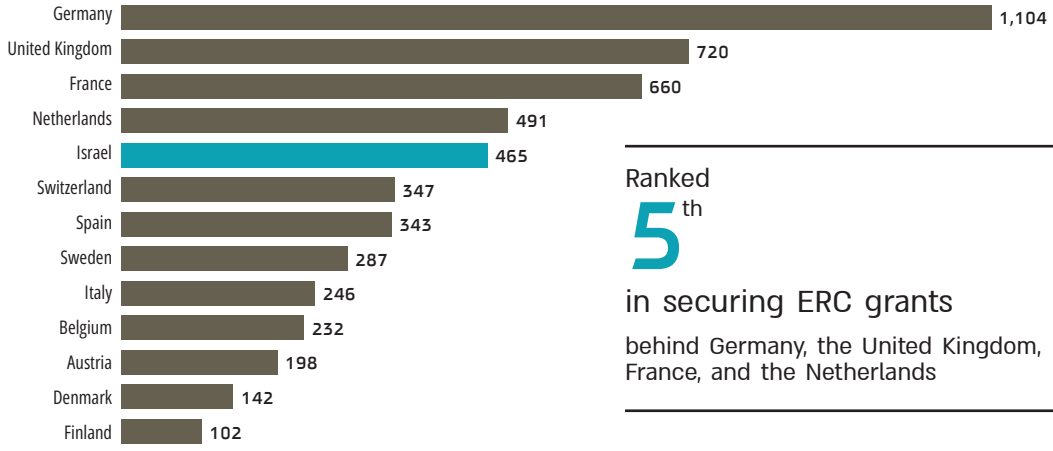
the full potential of developments from their research and bring them to fruition with the help of technology transfer companies. Such steps reflect an ongoing advancement towards stronger ties with industry and greater openness to strategic collaboration.

The proposed vision is to design a system based on synergy: academia will preserve its strength and mission in basic research but will also benefit from access to industry's advanced infrastructure. Industry, for its part, will gain access to groundbreaking research and to the training of high-quality human capital. This will create a bidirectional flow of knowledge, ideas, and people. This is not merely an economic partnership, but rather a prerequisite for strengthening the entire system and preserving Israel's leading position in science and innovation.

Life Sciences and Medicine

Basic research in the life sciences and medicine in Israel has achieved international recognition and notable success for many years. Most recently, this recognition has been demonstrated particularly in cancer immunology research, deciphering the biology of the microbiome, genetic editing of stem cells, understanding brain activity, and revolutionary models for explaining aging. In medicine, there have also been breakthroughs with potential applications, including the development of engineered antibodies for treating autoimmune diseases, three-dimensional bioprinting, personalized genetic therapies, and innovative technologies for diagnosing diseases. These research achievements have served as a basis for establishing biotechnology incubators and launching new startup companies. The life sciences in Israel have also demonstrated impressive success in winning European Research Council (ERC) grants, reflecting the high quality of Israeli researchers and research that meet stringent international criteria.

Number of ERC grant wins between 2015–2024 in life sciences and medicine



Ranked
5th
in securing ERC grants
behind Germany, the United Kingdom, France, and the Netherlands

Source: ERC Dashboar

Research in the life sciences and medicine is mostly experimental and requires resources in both skilled human capital and special, expensive equipment and infrastructure. The average individual grant amounts offered by the Israel Science Foundation to researchers in the life sciences and medicine are the highest among all fields, but still cannot keep pace with rising

research costs. **It is recommended to establish an academic committee to examine the cost of research inputs and adjust the level of individual research grants accordingly.**

Research in the life sciences and medicine is poised for a major transformation through the application of AI to both basic and applied research. The opportunities for groundbreaking research using AI tools are the focus of the "Life Sciences and Medicine" chapter of the full report, which analyzes both AI's potential and the factors currently holding back its advancement. Three areas were selected for discussion, although they represent only a small portion of AI's potential uses in biomedicine.

The first area is the use of medical databases. The unique structure of the Israeli healthcare system, which is managed by a small number of health funds, each with its own comprehensive digital database, gives Israel an advantage in analyzing medical data. Applying AI tools to these databases may provide indications for early disease detection, customization of treatments, and even prediction of health trends at both the individual and population levels. However, due to regulatory constraints and administrative barriers, academic researchers cannot easily access the data.

The second area examined involves the development of spatial protein structure prediction and identification of drug binding sites. This field is already being accelerated through the AlphaFold 3 model, which predicts three-dimensional protein structures using AI tools for structural modeling. However, in most academic institutions in Israel, there is a severe shortage of appropriate computing infrastructure and skilled personnel to operate it.

Approximately

280,000 NIS

per individual grant from the Israel Science Foundation.

It is recommended to establish an academic committee to examine the sharp increase in research input costs in recent years and to adjust the amounts of individual research grants accordingly.

The third area examined concerns brain-machine interfaces and focuses on developing devices that connect to the nervous system to improve cognitive and motor abilities. A key challenge in this field concerns the complexities involved in developing hardware sensitive enough to record brain activity, and additionally, the lack of skilled personnel with competencies that bridge neurobiology, data science, and engineering.

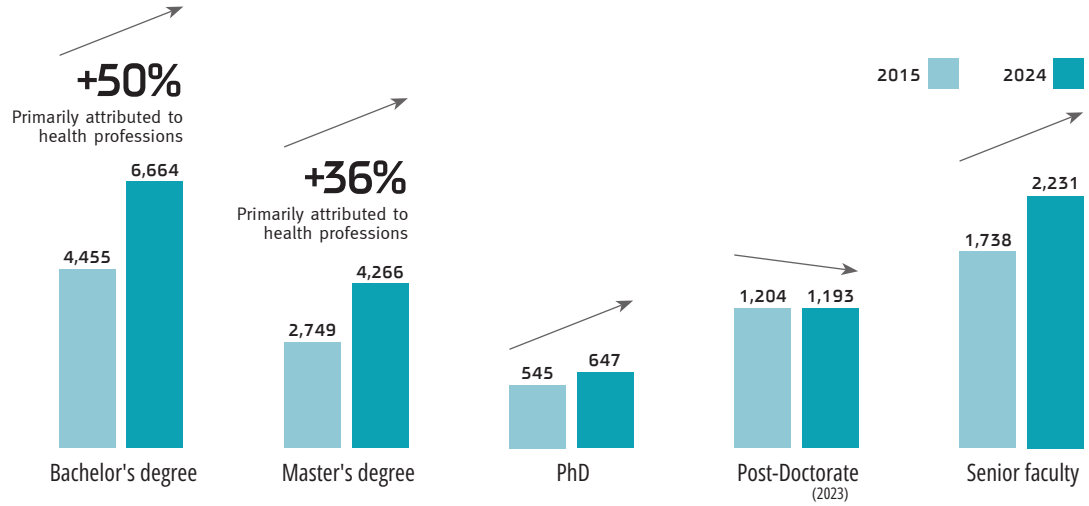
Despite the enormous potential of AI applications for research in these disciplines, there are factors hindering their use in Israeli academia – first and foremost, a severe shortage of computing infrastructure and skilled personnel. Currently, academic researchers are forced to

rely on partial and limited computing resource leftovers provided by industry, and struggle to conduct groundbreaking research and to compete on the global stage.

To address these challenges, large-scale investment is needed in several areas: first and foremost, **a dedicated supercomputer must be built for use by Israeli academia, and investment must be made in the personnel needed to operate it**. Additionally, **researchers at all levels, from students to senior faculty, must be trained in using AI tools**. This training is essential for developing advanced academic literacy and will allow scientists to use AI to further their research. **Interdisciplinary curricula must also be developed that integrate biological and medical knowledge with skills in using AI tools**, especially in the fields of neurobiology and engineering. It is also recommended **to examine ways to expand access to medical data, for example, by broadening the scope of the Freedom of Information Law and creating incentives for sharing medical data, all subject to strict ethical constraints**.

It should be noted that although the Israeli government has approved budgets for developing computing infrastructure for AI in academia, the funding has yet to be fully implemented. This investment is essential to maintaining Israel's position at the forefront of global biomedical research. Only by cultivating a new generation of researchers with appropriate training and by making advanced infrastructure available to them will it be possible to realize the potential inherent in AI for advancing science and medicine.

Number of university graduates and faculty



Source: Central Bureau of Statistics

The "Life Sciences and Medicine" chapter of the full report also follows developments in the advancement of physician-scientists, a topic that came up in the 2022 State of Science Report and has already received attention and made progress in the 2025 budget year through the "Mavri" accelerator program. Moreover, the Young Scholars Forum at the Israel Academy's Division of Natural Sciences recently published a document presenting additional insights regarding the advancement of the physician-scientist track. Among its recommendations: establishing an incentive system in hospitals for advancing physician-scientists, reducing salary gaps, increasing the number of research grants, and more. It is recommended to **establish a joint committee of VATAT, the Ministry of Health, and the Israel Medical Association to implement the recommendations made in the report of the Young Scholars Forum concerning the advancement of physician-scientists**.

Online report

The Israel Academy of Sciences and Humanities
Albert Einstein Square, P.O.B 4040, 9104001, Jerusalem
Telephone: +972-25676222
www.academy.ac.il