

The role of the Life Sciences innovation ecosystem for Italy's growth and competitiveness

11th edition

EXECUTIVE SUMMARY



The role of the Life Sciences innovation ecosystem for Italy's growth and competitiveness

11th edition

September 2025

Index

Preface	6
---------	---

Introduction	10
--------------	----

01	The TEHA Life Sciences Innosystem Index: performance of European research and innovation ecosystems in Life Sciences	18
----	--	----

1.1	The TEHA Life Sciences Innosystem Index: structure and methodology	19
1.2	Results of the TEHA Life Sciences Innosystem Index 2025	23
1.3	Human capital	24
1.4	Employment performance in the Life Sciences	25
1.5	Resources to support innovation	26
1.6	The effectiveness of the innovation ecosystem	27

02 The positioning of Italian scientific research in the context of European grants of excellence

28

03 Proposals for Italy

32

- Proposal 1: Launch a National STEMM (*STEM & Medicine*) Strategy 33
- Proposal 2: Strengthen Italian participation in European Union research funding programs of excellence 35
- Proposal 3: Strengthen research infrastructure and investment to improve technology transfer 37
- Proposal 4: Make Italy a *place-to-be* for innovation in the Life Sciences 39

Preface by Valerio De Molli

“Research consists of seeing what everyone has seen and thinking what no one has thought.”

Albert Szent-Györgyi
Nobel Prize winner for medicine

We have now reached the 11th edition of the **Technology Forum Life Sciences**, the flagship event of **TEHA’s Life Sciences Community**. This Community was established in 2015 with the aim of promoting research and innovation in the Life Sciences in Italy, supporting our country’s position on the international stage and encouraging institutions to take action in support of the Life Sciences ecosystem.

This edition also opens with an update of the results of **the TEHA Life Sciences Innosystem Index**, the composite index that measures the competitiveness of research and innovation ecosystems in the Life Sciences in European Union countries. The index, composed of 4 dimensions and 14 KPIs (Key Performance Indicators) analyzed over 8 years, for a total of 2,688 observations, ranks countries by measuring the performance of each innovation ecosystem. Thanks to the wealth of data collected, the index is a valuable source of information and guidance for all stakeholders in this sector.

The results of the index place **Italy in 10th place out of the 24¹ European Union countries** considered, with a score of 3.57. Although our country ranks among the countries with medium-high performance, it is still far from the top positions, respectively Denmark in 1st place (6.29 points), Germany in 2nd place (6.11 points), and Belgium in 3rd place (5.75 points).

A retrospective analysis of performance also shows that Italy lost one position in the rankings between 2022 and 2025, being overtaken by Spain, which, on the contrary, gained two positions, moving from 11th to 9th place.

When analyzing the weaknesses that have affected the decline of our ecosystem, it is necessary to highlight once again the need to intervene on our human capital: **we need more graduates and researchers with PhDs in Life Sciences**, areas in which

¹ Ireland, Lithuania, and Luxembourg do not have sufficient databases to be included in the TEHA Life Sciences Innosystem Index

Italy ranks only 14th and 16th in the EU. Our country also lags behind in the number of **graduates in STEM subjects**, ranking 14th in the EU, highlighting the need to focus on developing skills that complement those strictly related to health and are equally essential for innovation in the Life Sciences sector. Another negative aspect concerns the **proportion of people employed in the Life Sciences**, which is still undersized compared to its European peers: Italy ranks 16th in the EU with only 1.7% of total manufacturing employment in the sector. Finally, private R&D spending is also undersized compared to European peers, ranking 12th in the ranking.

The main strengths of our ecosystem are highlighted in the output variables of the TEHA Life Sciences Innosystem Index: Italy ranks **second** in terms of both the **number of scientific publications** and the number of **citations** in Life Sciences, confirming a strong propensity for basic research in the sector. The **export** value of the entire medical and pharmaceutical sector is also very positive: Italy has set a new historical record of **€57.2 billion**, ranking **3rd** among the countries mapped by the proprietary index and gaining one position compared to the previous year.

The analysis of the strengths and weaknesses of the Italian ecosystem was also enriched by a real **observatory on the attractiveness of European funds for research and innovation in the Life Sciences**. By analyzing all the interventions carried out so far (2021-2024) within the European Union's framework program for research and innovation, **Horizon Europe**, we were able to observe which European ecosystems were most successful in attracting resources for research excellence. Analysis of all the interventions dedicated to Life Sciences between 2021 and 2024 shows that **Italy is not among the top three countries that have been able to attract the most resources** in each of the five pillars analyzed: 6th place for ERC Grants distributed by the European Research Council, 5th place for Marie Skłodowska-Curie Actions, 6th place for resources dedicated to research infrastructure, 4th place for those planned in the Health Cluster, and 5th place for grants distributed by the European Innovation Council. Compared to Germany, the country that between 2021 and 2024 has managed to capture the largest amount of European resources dedicated to Life Sciences (€1,475.2 million), Italy has obtained less than half of the funds (€630.3 million). The resources that our ecosystem is unable to attract could have a major economic and social impact on the country: considering that for every euro invested in Horizon Europe, up to €11 could be generated by 2045, through a what-if analysis, TEHA Group estimates that Italy could generate **up to €17.9 billion in additional national GDP** if it closed the gap with Germany. This is a significant figure when you consider that we are talking about resources dedicated to research and innovation in a single economic sector.

Based on this evidence, TEHA has identified **four priority areas for action** in Italy: the need to define a National STEMM (STEM & Medicine) Strategy as soon as possible, with the aim of equipping Italy with the necessary skills and positioning it among the top performers in Europe; the urgent need to train more competitive researchers who can improve our performance in attracting European funding; the need to strengthen research infrastructure to improve technology transfer outputs; the goal of making Italy a place-to-be for innovation in the Life Sciences.

Before leaving you to read the Report and the complete results of our analysis, I would like to express my gratitude to **the partners** of the Life Sciences 2025 Community for their participation and proactive contribution to the life of the Community: **Fondazione Human Technopole, Fondazione Telethon, Heal Italia, Istituto Italiano di Tecnologia, National Biodiversity Future Centre, and Trentino Sviluppo.**

Finally, heartfelt thanks to the TEHA Working Group, composed of myself, Corrado Panzeri, Davide Skenderi, Arianna Basso, Lodovica Galbiati, Giulia Ercole, Silvia Della Giovanna, and Roberta Braccio.

Valerio De Molli

Managing Partner & CEO

The European House - Ambrosetti and TEHA Group

Introduction

The Life Sciences Community: mission and operating principles

The European House – Ambrosetti's Life Sciences Community was established in 2015 with the mission of ***“fostering of research and innovation in the Life Sciences sector in Italy, promoting centers of excellence and networking national stakeholders to facilitate knowledge transfer, the development of new projects, and improve the positioning and competitiveness of the country's economy at the international level.”***

The Life Sciences Community operates with the aim of being a **multi-stakeholder platform** where industrial, institutional, research, academic, and financial players can:

- **interact** within a confidential, high-level context;
- **share** their experiences, enhancing them in a high-level context;
- **build** valuable partnerships with the aim of promoting research and innovation in the Life Sciences;
- **learn** about the strategic opportunities arising from growth, internationalization, and technological transformation in the Life Sciences;
- **develop** projects that represent a source of development and growth for individual organizations and the entire ecosystem.

More specifically, the Life Sciences Community aims to:

- identify **challenges and opportunities for research and innovation** in the Life Sciences sector in Italy;
- continue the **work of positioning the Life Sciences sector**;
- promote **national excellence** and raise awareness in the country of the importance of **investment in research and innovation**;
- strengthen **direct interaction** between institutions, national and regional policy makers, academia, the world of research, business, and finance;
- develop **proposals and projects** and promote their implementation and realization;
- promote **technology transfer** activities and **initiatives** in the Life Sciences.

The long-term vision of the initiative is to maintain the Life Sciences Community as a **reference platform for reflection on research and innovation in the Life Sciences in Italy**, accredited as an authoritative and important interlocutor for *policy makers* and the country's *business community*.

MISSION

"Contribute to the enhancement of research and innovation in the Life Sciences sector in Italy, promoting centers of excellence and networking national stakeholders to encourage the transfer of knowledge, the development of new projects and improve the positioning and competitiveness of the country-system at an international level"

The Life Sciences Community is supported by a **solid network**, which unites the most important players in the innovative Life Sciences scene from the worlds of University and Research, Industry, Finance and Institutions, in order to enable synergies and encourage the creation of opportunities.



**UNIVERSITY
& RESEARCH**



INDUSTRY



FINANCE



INSTITUTIONS

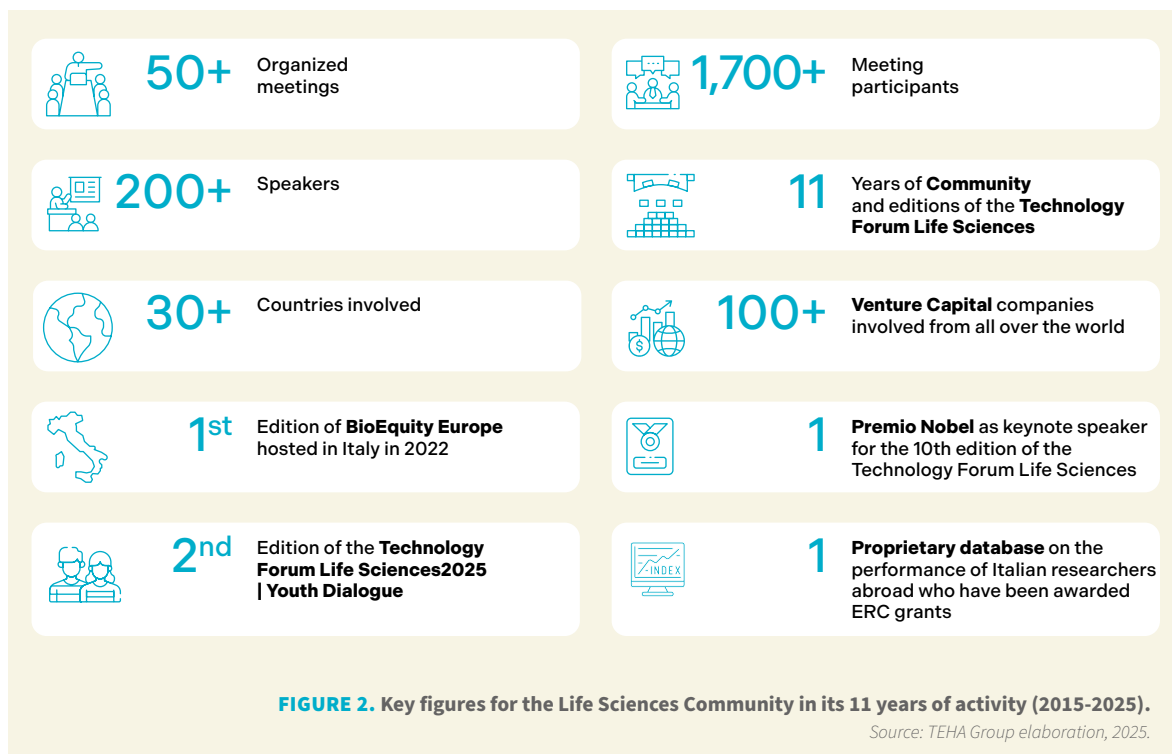
The Community also counts on the **Ambrosetti Club network**, which involves over 400 members in its activities, including entrepreneurs and top executives from national and multinational groups and companies operating in Italy.

FIGURE 1. Mission and network of the Life Sciences Community.

Source: TEHA Group elaboration, 2025.

To achieve these objectives, the Community's annual activities are designed and structured on several interrelated levels:

- organization of **round tables and in-depth meetings and discussions**, held periodically throughout the year, aimed at discussing key issues for the growth of the sector with the main stakeholders of the national Life Sciences ecosystem and experts in the field, gaining in-depth knowledge of national and international best practices, and developing concrete ideas to bring to the attention of national decision makers;
- creation of content and drafting of **the Strategic Report** "The role of the Life Sciences Innovation ecosystem in Italy's growth and competitiveness," which illustrates the latest analysis of trends in the national Life Sciences research and innovation ecosystem, together with the results of the discussions that emerged from the round tables, thematic insights, and priorities for action to enhance the sector's potential;
- design and implementation of **the Life Sciences Technology Forum**, the annual event of reference for the Life Sciences ecosystem in Italy, characterized by a high-level debate involving all the main stakeholders in the ecosystem, as well as guests and experts from around the world
- implementation and management of **communication and media activities** throughout the Community's annual cycle. Communication and positioning activities are developed throughout the year with a dedicated editorial plan and the use of all social media.



The Life Sciences Community's journey is part of the broader framework of The European House– Ambrosetti's **InnoTech Community**, established in 2011 within the Ambrosetti Club, with the aim of supporting the country's development in creating a strong innovation ecosystem, strengthening *"dialogue and relations between the industrial, scientific-technological, financial and institutional communities to promote growth opportunities and a culture of widespread innovation."*

The activities of the Life Sciences Community can count on the highly qualified network of the Ambrosetti Club, which since 1999 has brought together the top executives of national and multinational groups and organizations operating in Italy and pursues two primary goals: to contribute concretely to the civil and economic progress of our country and to the excellence and optimization of the institutions and companies rooted in it.

In addition, the Life Sciences Community works closely with the InnoTech Community network, The European House - Ambrosetti's platform created in 2011 within the Ambrosetti Club, which has become the reference point for in-depth analysis and discussion of issues related to the new frontiers of technology and innovation. The "Technology Forum" is the culmination of the InnoTech Community's journey and brings together, at the highest levels, the players representing the research and innovation ecosystem: academia and research centers, businesses, finance, and institutions.

Objectives, focus areas and partners of the Life Sciences Community 2025

The Life Sciences Community reached **its eleventh year of activity** in 2025, continuing the journey begun in 2015 with the aim of capitalizing on what had been achieved in previous years, maintaining a strong focus on key issues for the competitiveness of the sector and opening the debate on new topics.

The Community's main activities have focused on strategic issues such as **collaborative research** between businesses and academia, with the aim of outlining an Italian model that strengthens the output of **technology transfer**, starting from an analysis of the best-in-class European models; the development of an **observatory on the attractiveness of European funds for research and innovation in the Life Sciences**, which analyzes national performance compared with EU benchmark countries in terms of their ability to participate in Horizon Europe calls for proposals and attract resources for research and innovation; the analysis of the main **trends in innovation** in the Life Sciences at a global level, including new challenges related to innovation in areas such as **longevity, precision medicine, and biodiversity**; the training, retention, and attraction of **talent** in the Life Sciences and STEM disciplines.

The activities of the Life Sciences Community 2025 are made dynamic thanks to the support of a network of active and prominent partners in the national Life Sciences landscape, strongly committed to the development of the Italian research and innovation ecosystem: **Fondazione Human Technopole, Fondazione Telethon, Heal Italia, Istituto Italiano di Tecnologia, National Biodiversity Future Center, Trentino Sviluppo.**



FIGURE 3. The Partners of the Life Sciences 2025 Community.

The project is managed by the TEHA Group working group supervised by Valerio De Molli (Managing Partner & CEO) and composed of:

- Corrado Panzeri (Partner and Head of InnoTech Hub)
- Davide Skenderi (Senior Consultant & Project Leader)
- Arianna Basso (Program Manager)
- Lodovica Galbiati (Analyst)
- Giulia Ercole (Project Assistant)
- Silvia Della Giovanna (Project Assistant)
- Roberta Braccio (Project Assistant)
- Fabiola Gnocchi (Communication Manager)
- Erika Panuccio (Communication Manager)

The structure of the Strategic Report

The full version of the Strategic Report of the Life Sciences Community 2025 is available in Italian. This Executive Summary highlights the key findings.

The main objective of the Report is to provide stakeholders in the Life Sciences ecosystem with a high-level document for the development of strategic considerations and entrepreneurial, industrial, and investment actions in the sector, through **an in-depth analysis of priority issues related to research, innovation, and technology**, the result of a continuous exchange with Community Partners and guests invited to participate from time to time.

The document contains an analysis of the performance of European Life Sciences research and innovation ecosystems, international benchmark cases and best practices, sector analysis, contributions that emerged during meetings and discussions with key ecosystem stakeholders, and a number of concrete proposals to support action to strengthen the national ecosystem. The report also summarizes and systematizes the partners' guidelines and the reflections of the key players who have driven the Community Life Sciences' 2025 path.

More specifically, the Life Sciences Community 2025 Strategic Report contains:

- The performance of European research and innovation ecosystems in the Life Sciences.
- The results of the observatory on European funds for scientific research excellence.
- The Focus Areas of the Life Sciences Community 2025..
- The priority lines of action to strengthen the Italian Life Sciences ecosystem.

The TEHA Life Sciences Innosystem Index: performance of European research and innovation ecosystems in Life Sciences

01

1.1 The TEHA Life Sciences Innosystem Index: structure and methodology

In order to capture the multitude of factors that directly or indirectly influence the ability to ‘produce’ innovation, the TEHA Life Sciences Innosystem Index was developed by identifying uniform and comparable parameters over time, with the aim of measuring the results achieved by each innovation ecosystem in the Life Sciences and creating a tool for information and decision-making based on the performance of each country.

During the development process, the selection of the reference sample followed three sets of variables:

1. **Comparability and coverage** – understood as the ability to compare the countries under analysis in terms of socio-economic conditions and structures, as well as to find consistent and homogeneous data sources on the selected indicators. These are essential characteristics for ensuring consistency and comparability of data over time.
2. **Academic and managerial literature** on Life Sciences and factors that directly or indirectly influence their development – considering the main European and global databases, such as Eurostat and OECD³.
3. **Research and innovation output** in the Life Sciences – through in-depth analyses for each country in order to assess the real contribution to global innovation output (scientific publications, patenting activity, etc.).

Based on these criteria, **24 European Union countries** were identified – all Member States except Ireland, Lithuania, and Luxembourg, for which there is insufficient comparable data sources⁴.

³ Organisation for Economic Co-operation and Development.

⁴ Only countries with a minimum coverage of 65% of both the total indicators and the individual pillars were considered for the index.

The TEHA Life Sciences Innosystem Index makes it possible to compare the performance of the innovation ecosystems of 24 Member States of the European Union

Only EU countries with a coverage of at least 65% in all 4 dimensions considered were included

CRITERIA FOR CHOOSING THE REFERENCE SAMPLE

● Comparability and presence of homogeneous databases

● Analysis of the academic-managerial literature on European innovation centres

● Production of research and innovation in Life Sciences

THE SAMPLE ANALYSIS

1. Austria
2. Belgium
3. Bulgaria
4. Cyprus
5. Croatia
6. Czech Republic
7. Denmark
8. Estonia
9. Finland
10. France
11. Germany
12. Greece
13. Italy
14. Hungary
15. Latvia
16. Malta
17. Netherlands
18. Poland
19. Portugal
20. Romania
21. Slovakia **New Country**
22. Slovenia
23. Spain
24. Sweden

FIGURE 4. Selection criteria and reference sample for TEHA Life Sciences Innosystem Index analyses.

Source: TEHA Group elaboration, 2025.

The results of the top-performing countries in each category were compared with those of Italy to quantify the existing gaps and identify the main limiting factors, so as to define more clearly the areas in which action is needed.

The results for each ecosystem were then represented in terms of two macro-sets of indicators.

A. Input variables: selected to assess each country's endowment with respect to the determinants of overall innovation performance. Three subgroups were considered:

- **Human capital:** PISA scores⁵, tertiary education in Life Sciences and STEM subjects⁶ and PhD students in Life Sciences subjects;

5 The PISA (Programme for International Student Assessment) evaluation aims to investigate the level of education of adolescents in industrialized countries. The evaluation is conducted by the OECD every three years.

6 Acronym for "Science, Technology, Engineering, and Mathematics."

- **Employment performance:** personnel employed in R&D in Life Sciences, startup rate, and value added per employee.
 - **Financial resources to support innovation:** total investment in R&D in Life Sciences, consisting of public and private investment in R&D, and availability of venture capital;
- B. Output variables:** aimed at “capturing” at the highest level of synthesis the results of innovative effectiveness in terms of the production of innovations and their economic impact:
- **Effectiveness of the innovation ecosystem:** scientific publications in the Life Sciences, patents obtained in the Life Sciences, and exports in the sector.

Partly drawing on the work carried out in 2024, a database covering an eight-year period (2017-2024 or the last year available) was constructed for each variable in the index, reconstructing a homogeneous and comparable database and using information available from international statistical sources. The TEHA Life Sciences Innosystem Index 2025 is therefore a composite indicator based on a total of 2,688 observations⁷.

⁷ The total number of observations was calculated by multiplying the 14 indicators analyzed, the 24 countries identified, and the reference time frame of eight years.

	Dimensions	Indicators (Key Performance Indicators – KPI)	Rational	Source
INPUT	Human capital	PISA score (science and mathematics)	Quality of basic education	OECD
		Graduates in Life Sciences (out of total graduates)	Human capital with specific skills in Life Sciences	Eurostat
		Graduates in STEM (out of total graduates)	Human capital with scientific knowledge supporting Life Sciences	Eurostat
		New KPI PhD candidates in Life Sciences (out of total PhD candidates)	Human capital with advanced skills in Life Sciences	Eurostat
		R&D personnel in Life Sciences (out of total R&D personnel)	Impact of innovation on employment	Eurostat
	Employment capacity of enterprises	Employed in Life Sciences (out of total employees)	Ability to generate employment	Eurostat
		Startup rate of enterprise in Life Sciences	Propensity for entrepreneurship	Eurostat
		Labor productivity of enterprises in Life Sciences (value added per employee)	Propensity of employees to generate value	Eurostat
	Resources supporting innovation	R&D expenditure by enterprises in Life Sciences (per inhabitant)	Propensity of the private sector to invest in innovation	Eurostat
		Public R&D expenditure in health (per inhabitant)	Public support for research in the sector	Eurostat
		Attractiveness for Venture Capital and Private Equity investments	Capacity of the system to attract private investments	IESE University
OUTPUT	Effectiveness of the innovation ecosystem	Number of scientific publications in Life Sciences	Intellectual relevance of the sector	Scimago
		Patents obtained in Life Sciences at the European Patent Office	Quality of scientific output	EPO
		Exports in the Life Sciences sector	Impact of the Life Sciences sector on the country's economic structure	UNCTADSTAT

FIGURE 5. Summary table of key variables in the TEHA Life Sciences Innosystem Index 2025.

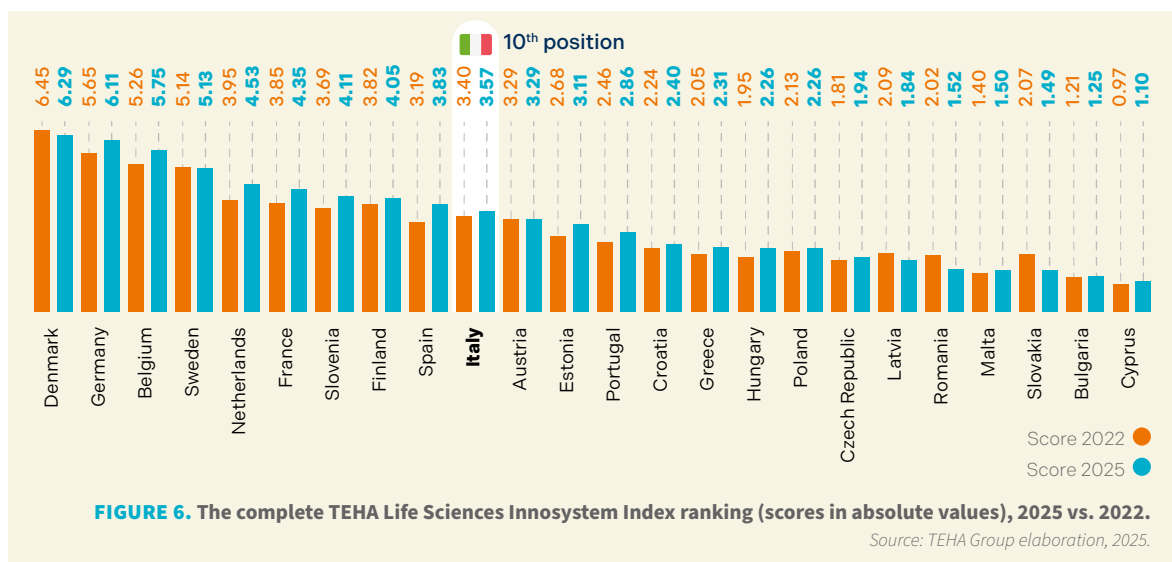
Source: TEHA Group elaboration of data from Eurostat, OECD, IESE University, EPO, Scimago, and UNCTADSTAT, 2025.

1.2 Results of the TEHA Life Sciences Innosystem Index 2025

The TEHA Life Sciences Innosystem Index 2025 was constructed by processing the latest 3 years of data available for each indicator⁸. The 2022 indicator (based on 2019-2020-2021 data) was also recalculated with the aim of analyzing the evolution of the indicators over time and providing a more complete view of the growth trends in different countries.

The results of the TEHA Life Sciences Innosystem Index 2025 confirm **Denmark in first place** with a score of **6.29**, followed by Germany in second place with 6.11 points and Belgium in third place with a score of 5.75. The top three positions remain unchanged from 2022, and the scores also remain very similar. In terms of overall ranking, Hungary is the country that has gained the most positions (+4), moving from 20th place in 2022 to 16th place in 2025.

Italy ranks 10th among countries with medium-high competitiveness, losing one position compared to 2022, despite recording a **+5.2%** increase in its score, equal to +0.18 points⁹.



The rest of this chapter describes and presents the results for each sub-indicator.

- ⁸ The three-year period 2022-2024 was taken as a reference or, in the absence of data updated to 2024, the last three years available.
- ⁹ Source: TEHA Group analysis, 2025.

1.3 Human capital

The first area of analysis of the TEHA Life Sciences Innosystem Index refers to **Human Capital**, understood as a composite dimension for measuring the availability of qualified resources to carry out research and development activities, both at present and in the future.

The Human Capital dimension was analyzed using **five indicators**: **PISA scores**¹⁰ in science and mathematics; **Life Sciences graduates** as a percentage of total graduates in each country; **STEM graduates**¹¹ as a percentage of total graduates in each country; **R&D personnel in Life Sciences** as a percentage of total R&D personnel in each country; **Life Sciences PhD students** as a percentage of total PhD students in each country.

Considering the average score obtained by each country in the individual indicators, Denmark ranks first with a score of 7.30, followed by Finland (6.88) and Sweden (6.75). **Italy ranks 17th with a score of 3.69**: a performance lower than that of the other benchmark countries such as Germany (5.73), Spain (4.61), and France (3.97), which rank 6th, 10th, and 13th, respectively.

However, Italy has gained two positions compared to 2022, when it ranked 19th. Germany maintains the same position, Spain gains one position, and France gains four.

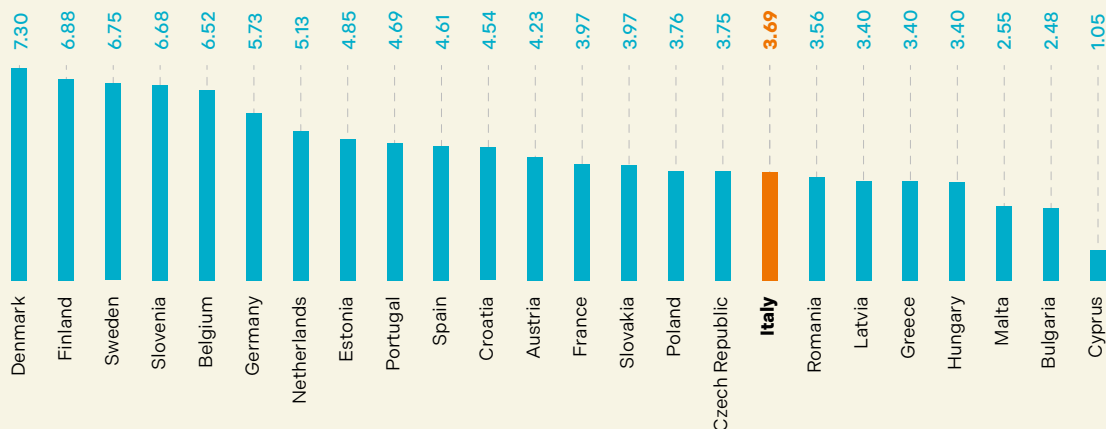


FIGURE 7. TEHA Life Sciences Innosystem Index ranking in the Human Capital dimension (score from 1 to 10, calculated as the average of the five indicators).

Source: TEHA Group elaboration of Eurostat and OECD data, 2025.

¹⁰ Program for International Student Assessment, a survey promoted by the OECD with the aim of assessing the level of preparation of students in the main industrialized countries.

¹¹ Science, Technology, Engineering, and Mathematics.

1.4 Employment performance in the Life Sciences

The second area of analysis of the TEHA Life Sciences Innosystem Index refers to **employment performance** in the Life Sciences, understood as a measure of the economic and employment importance of the Life Sciences industry.

The employment performance dimension of companies is made up of three indicators: **Life Sciences employees** as a percentage of total manufacturing employees; **Start-up rate** of Life Sciences companies; **Labor productivity** of Life Sciences companies.

Italy ranks very low in the ranking, in **21st place with a score of 1.42**. It lags far behind France, which is on the podium in 3rd place with a score of 4.51, but also behind Germany (10th place with a score of 2.52) and Spain (18th place, 1.84). Denmark ranks first (6.97).

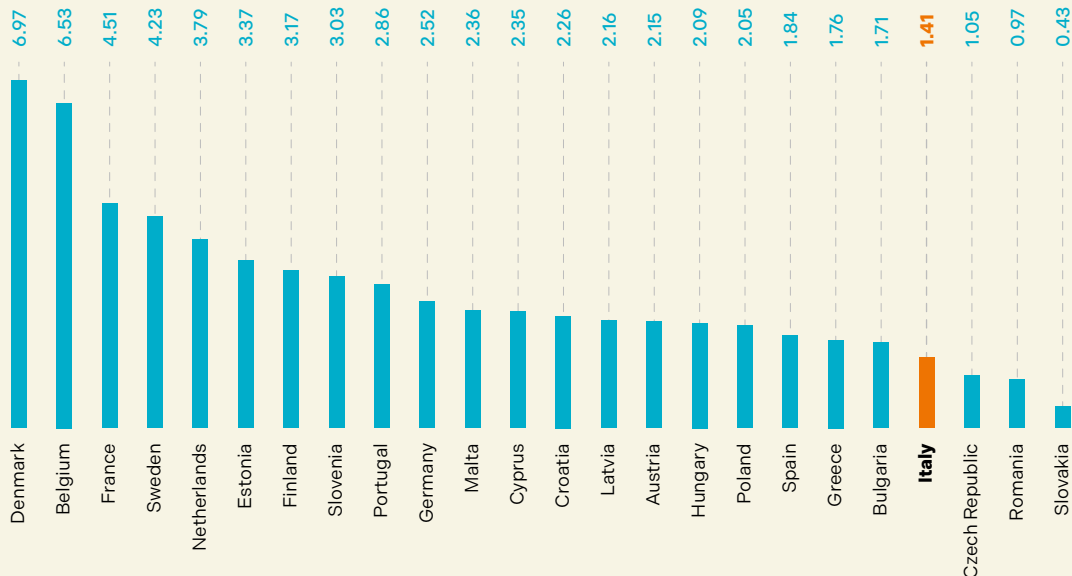


FIGURE 8. TEHA ranking – Life Sciences Innosystem Index in the dimension of Business Employment Performance (score from 1 to 10, calculated as the average of the 3 indicators).

Source: TEHA Group elaboration of Eurostat data, 2025.

1.5 Resources to support innovation

The third area of analysis of the TEHA Life Sciences Innosystem Index refers to **Resources supporting innovation**, developed to monitor the ability to sustain investment in research and development (public and private) and to attract venture capital and private equity. The availability and effectiveness of financial resources are crucial to stimulating innovation and promoting progress in the Life Sciences.

The Resources supporting innovation dimension consists of **three indicators: Research and Development expenditure per capita supported by companies** in the Life Sciences; **Public expenditure per capita on Research and Development** in health; **Attractiveness for investments in Venture Capital and Private Equity**.

Considering the average score obtained by each country in the individual indicators, Denmark ranks first with a score of 8.88 points. **° Italy ranks 10th overall, with 3.97 points.** Once again, our country lags behind benchmark countries such as Germany (6.43), Spain (5.36), and France (4.50), which rank 3rd, 5th, and 9th, respectively.

Italy drops one place compared to 2022, Germany's position remains unchanged, Spain gains three places, and France loses three.

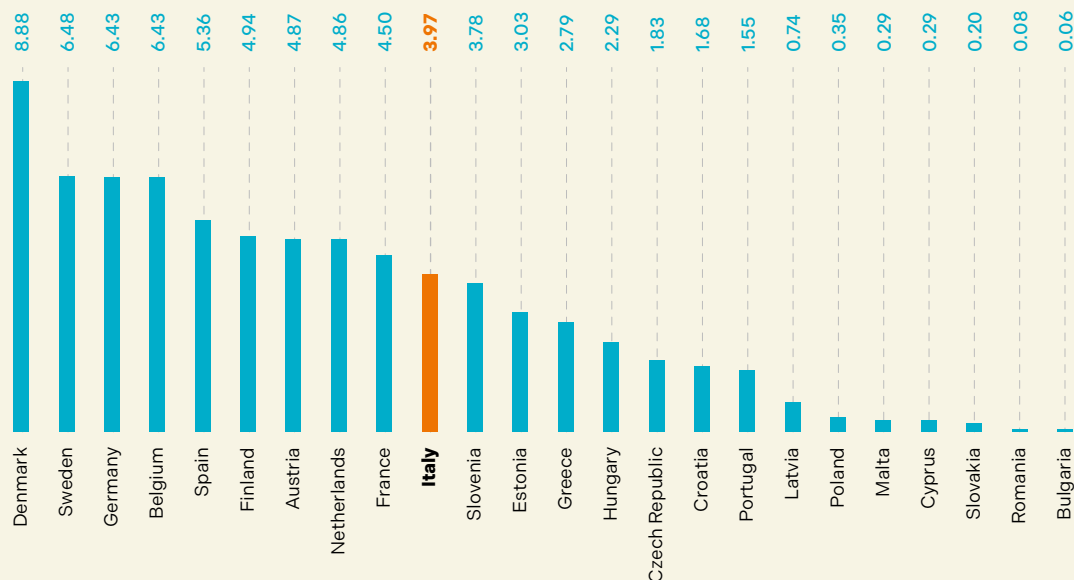


FIGURE 9. TEHA Life Sciences Innosystem Index ranking in the dimension Resources supporting innovation (score from 1 to 10, calculated as the average of the 3 indicators).

Source: TEHA Group processing of Eurostat and IESE University data, 2025.

1.6 The effectiveness of the innovation ecosystem

The fourth and final area of analysis, referring to output variables, of the TEHA Life Sciences Innosystem Index is the **Effectiveness of the Innovation Ecosystem**, designed to capture at the highest level of synthesis the results in terms of innovative effectiveness, understood as the production of new ideas and their economic impact.

The Effectiveness of the Innovation Ecosystem dimension consists of **three indicators**: **Number of scientific publications in Life Sciences**; **Patents obtained in Life Sciences** at the European Patent Office; **Exports in the Life Sciences sector**.

In this case, **Italy ranks second with the highest score (5.13)**, behind only Germany (first in all indicators with an overall score of 10.0). This data highlights the great capacity of our ecosystem to produce innovation and be highly competitive in foreign markets.

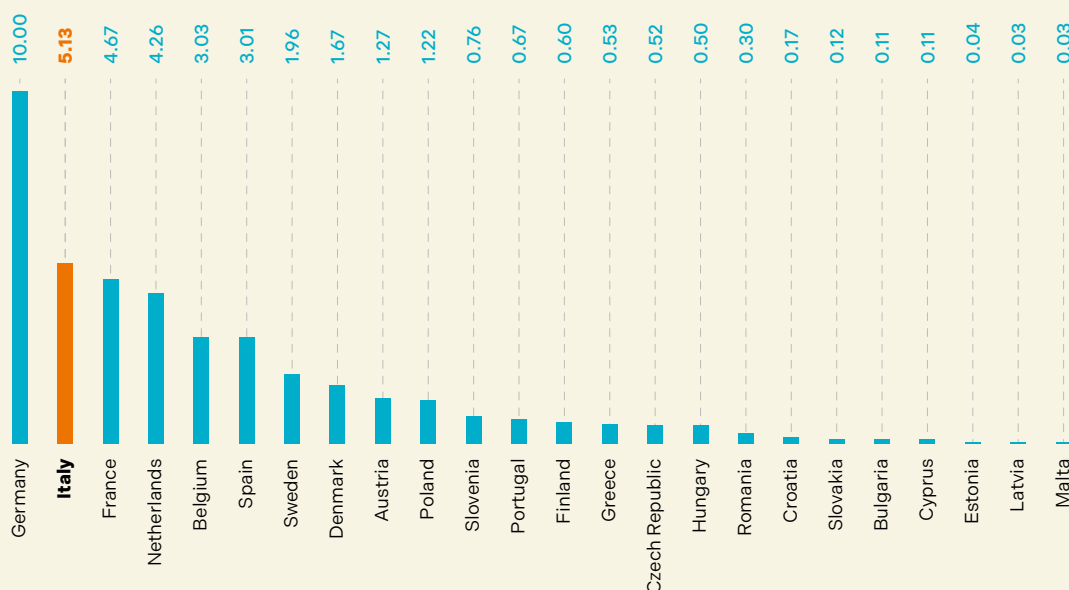


FIGURE 10. TEHA Life Sciences Innosystem Index ranking in terms of the effectiveness of the innovation ecosystem (score from 1 to 10, calculated as the average of the three indicators).

Source: TEHA Group elaboration of Scimago, EPO, and UNCTADSTAT data, 2025.

The positioning of Italian
scientific research
in the context of European
grants of excellence

02

Since its inception, the Community Life Sciences has placed **talent** at the center of the discussion on how to improve the Italian innovation ecosystem in the Life Sciences. The **ability to train talent, retain it, and attract others from foreign countries** is essential to maintaining the competitiveness of our national ecosystem.

A fundamental part of the growth of these young researchers and scientists consists of opportunities to obtain **European funding**, which is crucial for supporting scientific research in the ecosystems of individual countries. EU funding stands out not only for the amount of resources dedicated but also for the quality and rigor of the criteria for selecting and allocating these resources.

The main program through which the European Union funds research and innovation is **Horizon Europe**, which provides for the distribution of **€93.5 billion over the period 2021-2027**. Horizon Europe is a continuation of its predecessor, the **Horizon 2020** program, which allocated €80 billion between 2014 and 2020.

The new Horizon Europe program has ambitious goals:

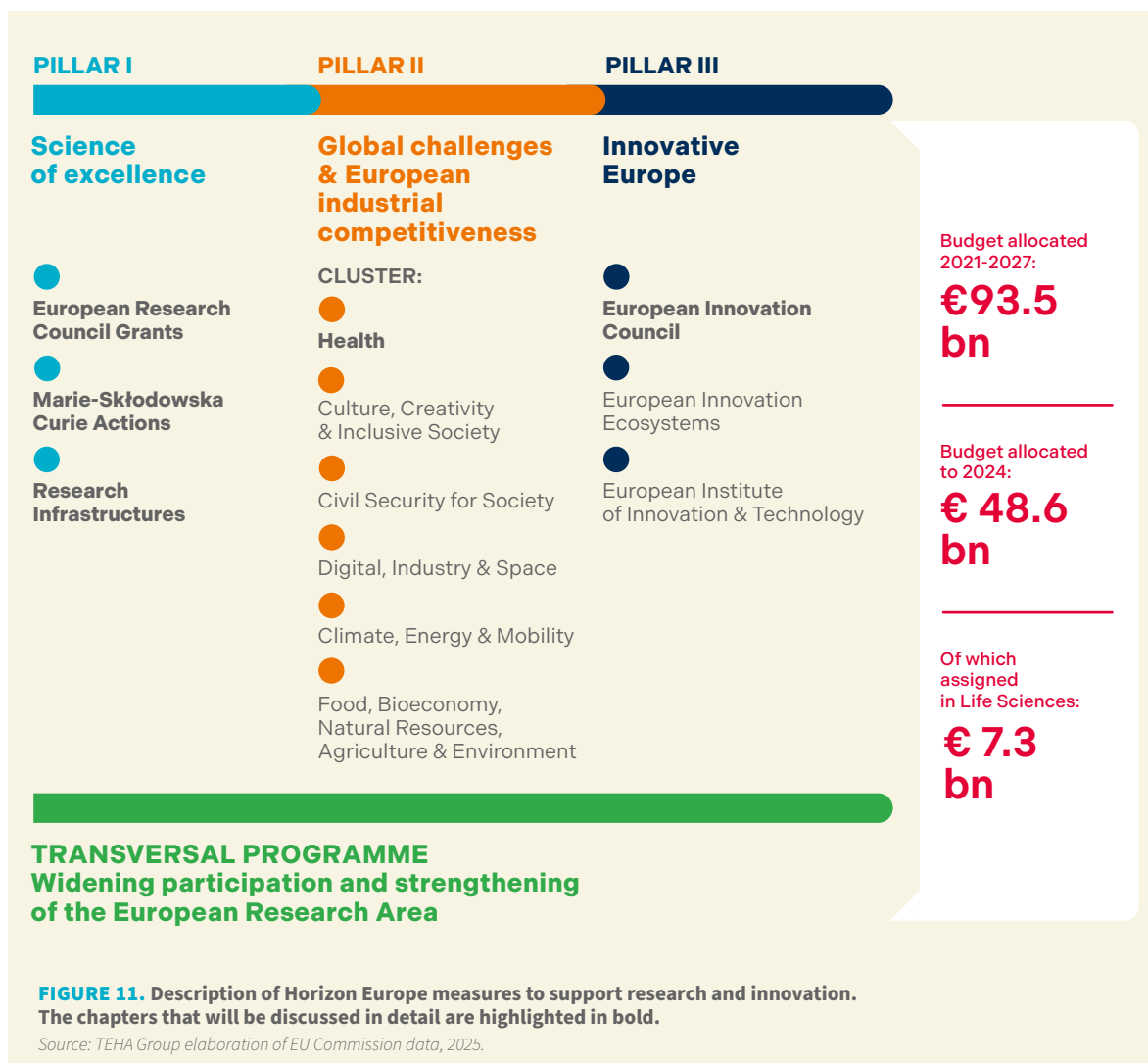
- to address the challenges of climate change;
- supporting the EU in achieving the United Nations' Sustainable Development Goals (SDGs);
- promoting collaboration and strengthening the impact of research and innovation in the development and implementation of EU policies;
- supporting the creation and dissemination of new scientific and technological knowledge;
- creating jobs, stimulating economic growth and industrial competitiveness by involving the best talent in the EU, optimizing the impact of investments in the Union.

Horizon Europe consists of **three pillars**, which are divided into specific programs and themes, and a cross-cutting program that intersects with each of the three pillars:

- Pillar I: **Excellent Science**, which aims to fund European scientific excellence in basic research. Pillar I has been allocated **€25 billion**;
- Pillar II: **Global Challenges & European Industrial Competitiveness**, which aims to accelerate the development of key technologies to meet the SDGs and EU policy objectives. Pillar II has been allocated **€53.5 billion**;
- Pillar III: **Innovative Europe**, through which the EU intends to stimulate revolutionary discoveries capable of creating new markets and ecosystems conducive to innovation. Pillar III has been allocated **€13.6 billion**.
- Cross-cutting program across the three pillars: **Widening Participation and Strengthening the European Research Area**, which includes measures to strengthen collaboration and improve research management capabilities, especially in countries that are less advanced in terms of R&D, with the aim of ensuring that every region has the same opportunities to access research.

Each of the pillars is in turn divided into several programs that provide forms of funding for research and innovation at different stages of their development—from basic research, funded for example through the European Research Council Grants provided for in Pillar I, to the market entry and early industrial testing phases referred to in Pillar III. Several of these programs also include a specific section on Life Sciences, which will be analyzed and presented later in this chapter.

In the period 2021-2024, **€48.6 billion** was spent, equal to 52.0% of the total budget allocated for the period 2021-2027. Of this, **€7.3 billion** (15.0% of the total) was allocated to projects related to **Life Sciences**.



The funds obtained by Italy through Horizon Europe measures with a direct impact on Life Sciences were analyzed in detail and compared with those of the main European benchmark countries. The analysis reveals a picture of general backwardness: in the period 2021–2024, **Italy** attracted a total of **€630.3 million**, a figure that does not allow it to rank among the top three countries in terms of resources received. The gap between Italy and the top-ranked country, **Germany**, which raised **€1,475.2 million** over the same period, highlights our country's persistent difficulty in successfully participating in European calls for proposals, with consequent limitations in the availability of resources for Life Sciences research.



FIGURE 12. Resources attracted by the top three countries plus Italy in Horizon Europe measures with a direct impact on Life Sciences (millions of euros). The figures refer to the period 2021–2024.

Source: TEHA Group elaboration of EU Commission data, 2025.

Proposals for Italy

03

Proposal 1: Launch a National STEMM (STEM & Medicine) Strategy

Investing in human capital and improving the skills of young people means laying the foundations for an ecosystem capable of producing excellent research while also transforming it into a scientific, economic, and social driving force for the country. A National STEMM Strategy, focusing on skills related to STEM subjects and Life Sciences (*Medicine*), can be the key to revitalizing Italian innovation and strengthening the country's long-term competitiveness.

RATIONALE

Human capital is the first critical factor for the competitiveness of a research and innovation ecosystem. Although Italy has seen an overall increase in the number of graduates in recent years, it still lags behind in the training of scientific profiles. **Graduates in STEM disciplines** account for **23.4%** of the total, compared to 35.5% in Germany and 24.5% in France, while **graduates in Life Sciences** account for just **16.3%**, far behind Belgium's 27.6%. These figures are reflected in an estimated need for at least **120,000 additional STEMM graduates** to reach the threshold of the top European performers. The skills gap, however, is already apparent in the early years of schooling: Italy's results in the PISA tests for mathematics and science (474 points) are below the EU average (485), indicating shortcomings in basic education.

Some European countries show that decisive action can reverse this trend. In February 2025, Sweden launched a national STEM strategy covering the entire educational pathway (from primary school to university). The strategy involves the creation of a national STEM control room, tasked with coordinating educational institutions, businesses, and universities, with the aim of stimulating early interest among young people, monitoring results, and proposing concrete interventions. Among the targets set are: increasing the proportion of top performers in mathematics to 15% by 2033, reaching 25% of students enrolled in higher science programs by 2035, and reaching 90,000 STEM university students in the same year. Hungary, which has climbed four places in the TEHA index this year, has set the ambitious goal of increasing the proportion of university students in STEM courses to 50% by 2030.



In 2023, Italy developed STEM guidelines recommending that schools of all levels integrate innovative teaching methods and laboratory activities into their educational offerings to strengthen scientific, technological, engineering, and mathematical skills. However, this starting point is not enough to bridge the existing gaps. The lack of qualified human capital risks becoming a bottleneck for research growth, for the ability of companies to innovate, and for the country's attractiveness to investors and multinationals operating in technology-intensive sectors. In a global scenario where competition is increasingly based on the availability of talent, Italy cannot afford to fall behind. A strategic plan is needed that focuses on young people, guaranteeing them quality training opportunities and the chance to enter scientific and industrial supply chains of excellence.

RECOMMENDATIONS

- Launch a **National STEM Strategy** with clear and measurable objectives for the training of graduates and doctoral students.
- Enhance **guidance** programs **and dedicated scholarships** to encourage enrollment in STEM courses and reduce regional and gender gaps.
- Strengthen the connection between **universities and the world of work** by promoting and simplifying access to internships, projects with companies, and training courses integrated with industrial needs.

Proposal 2: Strengthen Italian participation in European Union research funding programs of excellence

Successful participation in European funding programs for scientific research excellence is a key opportunity to accelerate new discoveries and train new generations of scientists. Italy must set itself the goal of catching up with the top European performers in terms of attracting EU funding, supporting targeted training and rigorous preparation of its researchers to increase participation in these programs and improve the success rate. Every euro captured by our research and innovation ecosystem has a decisive impact on the country's economic growth and well-being.

RATIONALE

Horizon Europe, with a budget of €93.5 billion for the period 2021-2027, is the EU's main instrument for funding research and innovation. Every euro invested in this program generates up to €11 in economic benefits over the following 20 years. Nevertheless, Italy struggles to attract resources in line with its scientific potential: in the Life Sciences sector, Italy is not among the top three countries that have been able to attract the most resources in each of the five pillars analyzed.

This gap produces a clear negative balance: many Italian researchers win ERC grants, but they do so abroad, contributing to the growth of other countries' ecosystems and impoverishing their own. If Italy were to close the gap with Germany, the country that between 2021 and 2024 managed to capture the largest amount of European resources dedicated to Life Sciences (€1,475.2 million vs. Italy's €630.3 million), in terms of its ability to attract European funds, our country could generate up to **€17.9 billion in additional impact on GDP** over the next two decades.

Investing in training and supporting researchers to participate in EU calls for proposals is not only a way to obtain more economic resources: it means strengthening the international reputation of our research, consolidating collaboration networks with the best global centers, and attracting new talent from abroad.



RECOMMENDATIONS

- Develop **structured training and mentoring programs** for researchers and young scientists, with a specific focus on writing competitive proposals for EU calls for proposals.
- Create **guidance and support desks** at universities and research centers to accompany researchers through all stages of the application process, from identifying appropriate calls to drafting the application.
- Promote **greater awareness** of the opportunities offered by research funding programs through communication initiatives, workshops, and the sharing of best practices.

Proposal 3: Strengthen research infrastructure and investment to improve technology transfer

Transforming research results into innovation requires adequate facilities and investment, with specialized skills. Strengthening research infrastructure and technology transfer mechanisms means giving substance to scientific discoveries, encouraging the creation of new businesses, accelerating innovation and the adoption of new technologies, and consolidating the country's ability to compete in the most advanced sectors of Life Sciences.

RATIONALE

Italy ranks among the European countries with the most significant scientific output in the Life Sciences sector, but the transition from research to innovation remains the weak point of the system. **Technology transfer offices** have an average of only **5.7 employees**, compared to 16.3 in the main European centers. At this rate, the gap would only be closed in 2045.

Our country boasts internationally recognized academic excellence and a solid base of publications and patents, but too often lacks the ability to translate these results into innovative products, services, and businesses. The gap with the benchmarks is significant: in Germany and the Netherlands, Technology Transfer Offices (TTOs) act as real 'bridges' between universities and industry, with staff specialising in intellectual property, business development and fundraising, while in Italy these functions often remain marginal.

Private funding for research and development in the Life Sciences is also still very limited: only €13.8 per capita, compared to €261.2 in Belgium, which, thanks to a favorable tax framework and advanced technological infrastructure, has attracted almost twenty times more foreign investment. This gap reduces the capacity of our system to accompany research through to the more applied stages, creating a 'valley of death' that hinders the emergence of new innovative companies.



The PNRR resources have allocated approximately €1.8 billion to technology transfer in the Life Sciences, but the challenge is now twofold: on the one hand, with the program nearing its conclusion, it is necessary to ensure that the most impactful initiatives are not abandoned but continue to be supported through the commitment of both the public and private sectors. On the other hand, these initiatives must now be enhanced and oriented towards truly shared infrastructures capable of dialoguing with businesses, avoiding dispersion in fragmented interventions. Without a qualitative leap in research facilities, TTO personnel, and public-private collaboration, Italy risks remaining a country that excels in science but is still weak in innovation and its industrial translation.

RECOMMENDATIONS

- Strengthen **technology transfer offices** with greater resources, specialized personnel, and continuous training, aligning them with the European average.
- **Support the derisking of projects** through state funds dedicated to the embryonic stages, making projects more mature and attractive to venture capital investors.
- **Promote and strengthen existing networks** and PNRR initiatives by encouraging greater collaboration between the public and private sectors.

Proposal 4: Make Italy a *place-to-be* for innovation in the Life Sciences

Simplifying rules, ensuring stability, and building shared national governance are essential conditions for attracting researchers, businesses, and capital. To compete with the most advanced European countries, clear procedures, targeted incentives, and a common vision that reduces the current fragmentation are needed. Making Italy a *place-to-be* in the Life Sciences means offering a competitive environment capable of supporting innovation, stimulating public-private partnerships, and positioning the country among the European leaders in the sector.

RATIONALE

Long-term vision, national governance, and regulatory simplification are the factors that distinguish leading countries in innovation and successful strategies. Denmark has launched a national strategy for Life Sciences with a budget of over €500 million, accompanied by a plan to attract investment and strengthen skills involving universities, businesses, and institutions. Similarly, Spain has implemented a 2024-2028 strategic plan for the pharmaceutical industry that focuses on innovation and has already secured €9 billion in investments for the coming years, attracting foreign capital and consolidating the country's role as a European hub. Finally, Germany has adopted targeted strategies to support leadership in the biotechnology and pharmaceutical sector, including specific objectives for research and development of new advanced therapies in the government's "coalition agreement" as early as 2021, as well as strong support for production in the sector.

Italy, on the other hand, does not yet have a national strategy with a dedicated budget for Life Sciences. Fragmented governance, regulatory complexity, and instability make the environment unattractive to researchers, startups, and foreign investors. In the absence of a unified vision, isolated and temporary initiatives prevail, with the risk of dispersing available resources and failing to give continuity to the efforts undertaken. Despite its scientific and industrial excellence, the country risks losing ground if it is unable to offer a competitive and stable environment.



Positioning Italy as *the place to be* for innovation in the Life Sciences means not only improving the regulatory framework but also promoting greater integration between the public and private sectors, between research and business, and between the national and international levels. It is a strategic objective that can determine Italy's role in the global map of innovation for health, transforming a sector that is already a driving force today into a pillar of the country's economic competitiveness and scientific diplomacy.

RECOMMENDATIONS

- **Define a national governance for research and innovation** to coordinate activities between ministries, regions, universities, and businesses, in order to give continuity and vision to the Life Sciences sector.
- **Introduce targeted tax incentives and regulatory simplifications** to make Italy more attractive for R&D investment and innovative companies in the sector.
- **Promote public-private partnerships and scientific diplomacy initiatives**, positioning Italy as a European hub for innovation in Life Sciences and for attracting talent and capital.

Italy

MILAN

Via F. Albani, 21
20149 Milano
Tel. +39 02 46753.1

BOLOGNA

Via Persicetana Vecchia, 26
40132 Bologna
Tel. +39 051 268078

ROME

Via Po, 22
00198 Roma
Tel. +39 06 8550951

Europe

BERLIN

GLC Glücksburg Consulting AG
Albrechtstraße 14 b 10117 Berlin
Tel. +49 30 8803 320
Mr. Martin Weigel
berlino@ambrosetti.eu

BRUSSELS

Ambrosetti Brussels Office
Tel. +32 476 79 10 89
Ms. Laura Basagni
laura.basagni@ambrosetti.eu

HAMBURG

GLC Glücksburg Consulting
AGBülowsstraße 922763 Hamburg
Tel. +49 40 8540 060
Mr. Martin Weigel
amburgo@ambrosetti.eu

ISTANBUL

Consulta
Kore Şehitleri Caddesi Üsteğmen
Mehmet Gönenç Sorak No. 3
34394 Zincirlikuyu-Şişli-Istanbul
Tel. +90 212 3473400
Mr. Tolga Acarli
istanbul@ambrosetti.eu

LONDON

Ambrosetti Group Ltd.
37-38 Long Acre
London WC2E 9JT
london@ambrosetti.eu

MADRID

Ambrosetti Consultores
Castelló nº 19
Madrid, 28001
Tel. +34 91 575 1954
Ms. Marta Ortiz
madrid@ambrosetti.eu

Asia

BANGKOK

Mahanakorn Partners Group Co., Ltd.
Kian Gwan House III, 9th Floor, 152
Wireless Rd., Lumpini,
Pathumwan, Bangkok, 10330, Thailand
Tel. +66 (0) 2651 5107
Mr. Luca Bernardinetti
bangkok@ambrosetti.eu

BEIJING

Ambrosetti (Beijing) Consulting Ltd.
No.762, 6th Floor, Block 15
Xinzhaojiayuan, Chaoyang District
Beijing, 100024
Tel. +86 10 5757 2521
Mr. Mattia Marino
beijing@ambrosetti.eu

SEOUL

HebronStar Strategy Consultants
4F, ilsiln bldg., 27,Teheranro37-gil,
Gangnam-gu, Seoul
Tel. +82 2 417 9322
Mr. Hyungjin Kim
seoul@ambrosetti.eu

SHANGHAI

Ambrosetti (Beijing) Consulting Ltd.
Room 20L, Liduxingui Building,
No.831Xinzha Road, Jing'an District,
Shanghai
Tel:+86 21 52861891
Tel. +86 21 5237 7151
Mr. Mattia Marino
shanghai@ambrosetti.eu

SHANGHAI

Barbatelli & Partners Management
Consultant Co. Ltd. (Shanghai)
Room 102, End of Lane No. 729, Shan Xi
Road (N), Jing'an District, Shanghai
Tel. +86 (0)21 62719197
info@barbatelli.net

SINGAPORE

The European House - Ambrosetti
(Singapore) Consulting Pte. Ltd.
2 Woodlands Square
#05-70, Woods Square
Singapore 737715
Mr. Marco Bardelli
singapore@ambrosetti.eu

TOKYO

Corporate Directions, Inc. (CDI)
Tennoz First Tower 23F
2-2-4 Higashi Shinagawa, Shinagawa-ku
Tokyo, 140-0002
Tel. +81 3 5783 4640
Mr. Nobuo Takubo
tokyo@ambrosetti.eu

VIENTIANE

Laos Office
Rue Samsenthai N° 073 Unit 07,
Kaoyod Vill., Sisatanak District
0104 Vientiane Capital
Tel. +856 (0)20 52311570
Mr. Vincenzo Iacuzio
laos@ambrosetti.eu

Middle East

DUBAI

The European House – Ambrosetti
Middle East
Business Center Dubai World Central
P.O. Box: 390667 - Dubai - UAE
Mob. (UAE) +971.54.55.10003
Mob. (IT) +39.340.592.1349
Mr. Luca Miraglia
luca.miraglia@ambrosetti.eu

Africa

ROSEBANK - JOHANNESBURG

TEHA Africa Ltd
116 Oxford Road, Oxford & Glenhove,
Building 1
Rosebank
2196, Johannesburg
Tel. +27 76 487 8195
Mr. Nico De Kock
info@ambrosetti.za

