European Parliament
2024-2029

TEXTS ADOPTED

P10_TA(2025)0165

Future of the EU biotechnology and biomanufacturing sector: leveraging research, boosting innovation and enhancing competitiveness

European Parliament resolution of 10 July 2025 on the future of the EU biotechnology and biomanufacturing sector: leveraging research, boosting innovation and enhancing competitiveness (2025/2008(INI))

The European Parliament,

– having regard to the Treaty on the Functioning of the European Union (TFEU), in particular Articles 9, 151, 152, 153(1) and (2) thereof, as well as Articles 173 and 179 thereof, which concern EU industrial policy and research and refer to, among other things, the competitiveness of the Union's industry and the strengthening of the Union's scientific and technological bases,

– having regard to the Treaty on European Union, in particular Article 5(3) thereof and Protocol No 2 thereto on the application of the principles of subsidiarity and proportionality,

– having regard to the Commission communication of 20 March 2024 entitled 'Building the future with nature: Boosting Biotechnology and Biomanufacturing in the EU' (COM(2024)0137),

– having regard to the report by Mario Draghi of 9 September 2024 entitled 'The future of European competitiveness',

– having regard to the Commission communication of 29 January 2025 entitled 'A Competitiveness Compass for the EU' (COM(2025)0030),

– having regard to the Commission communication of 26 February 2025 entitled 'The Clean Industrial Deal: A joint roadmap for competitiveness and decarbonisation' (COM(2025)0085),

– having regard to the Commission communication of 11 December 2019 entitled 'The European Green Deal' (COM(2019)0640),

– having regard to the report by Enrico Letta of 10 April 2024 entitled ‘Much more than a market’,

– having regard to the Commission communication of 19 February 2025 entitled ‘A Vision for Agriculture and Food – Shaping together an attractive farming and agri-food sector for future generations’ (COM(2025)0075),

– having regard to Rule 55 and Rule 148(2) of its Rules of Procedure,

– having regard to the report of the Committee on Industry, Research and Energy (A10-0123/2025),

A. whereas the EU biotechnology and biomanufacturing sector has been recognised as one of 10 strategic technology sectors for Europe’s competitiveness, economic security and sustainability; whereas the sector is characterised by very high productivity, growth and employment, and delivers globally competitive, cutting-edge solutions in healthcare, life sciences, industrial production and transformation, sustainable biomanufacturing, energy and food security; whereas biotechnology and biomanufacturing are important enablers of the bioeconomy at large; whereas biotechnology and biomanufacturing can help enhance the EU’s strategic autonomy, resilience and circularity by reducing industry’s dependency on fossil-based input and other external dependencies in various sectors; whereas the biotechnology and biomanufacturing sector still faces regulatory and financial obstacles and an incomplete internal market; whereas the Commission is expected to present an EU biotech act, an updated EU bioeconomy strategy, an EU life sciences strategy, an EU innovation act and an EU circular economy act;

B. whereas according to the Organisation for Economic Co-operation and Development (OECD), biotechnology is defined as the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services; whereas biomanufacturing is not clearly defined and the Commission should therefore propose such a definition; whereas a definition of biomanufacturing should be future-proof, open to scientific and technological developments, and technology neutral, so as to broadly encompass the use of biotechnology or other technologies for the production of bio-based material products and solutions including, but not limited to, chemical, mechanical or thermal processes;

C. whereas the biotech and biomanufacturing industries have led the development and deployment of breakthrough innovations in healthcare, such as mRNA-based vaccines; whereas biotechnology processes can be used to manufacture active pharmaceutical ingredients and key manufacturing inputs for medicines;

D. whereas the COVID-19 pandemic highlighted the importance of having robust raw material value chains and manufacturing capabilities within Europe, to ensure security of supply of critical products and to mitigate shortages, for example of essential medicines;

E. whereas artificial intelligence (AI) can help drive biotechnology innovation – e.g. in personalised medicine and drug discovery – resulting in health and environmental benefits; whereas the use of AI in biotechnology can also present ethical challenges and risks, related to the protection of private data, which need to be addressed in order to maintain public trust and acceptance;

F. whereas biotechnology is applied in various aspects of animal and plant-based agriculture and also indirectly, through its use in activities such as waste management;

G. whereas biotechnology can strengthen the resilience of forests and, in the case of biomanufacturing, the forest sector can offer sustainably produced, renewable and recyclable raw materials that can be used in high-value innovative products, materials and applications;

H. whereas the EU is a global leader in research and biomanufacturing capacity, yet its potential remains unexploited due to the lack of a sufficiently coordinated policy framework that enables the efficient scaling up of innovation, the attraction of investment and the commercialisation of new technologies; whereas the ‘one in, one out’ approach ensures that all burdens introduced by Commission initiatives are considered, and administrative burdens are offset by removing burdens of equivalent value in the same policy area at EU or Member State level; whereas Parliament has called for the EU’s research budget to be doubled; whereas EU private investment in research, development and innovation is lagging behind other major economies; whereas promoting investment in pioneering demo and commercial production plants can accelerate the commercialisation of EU innovation in the bio-based industries;

I. whereas urgent, coherent and consistent action needs to be taken during the next few years to make the EU a world leader in biotechnology, biomanufacturing and life sciences effecting a bold level of change, in accordance with due process and supported by competitiveness checks and adequate funding;

J. whereas lengthy and complex authorisation procedures, particularly concerning approval times, represent a competitive disadvantage for EU operators and drive project developers out of the EU, and hinder industrial deployment and growth;

K. whereas current EU regulatory frameworks do not cater precisely to the specificities of bio-based products; whereas the existing

regulatory authorisation processes for biotech products needs to be urgently addressed to ensure that the EU remains globally competitive; whereas an effective regulatory framework for conducting clinical research is essential for the competitiveness of the most innovation-intensive aspects of the EU's pharmaceutical and biotechnology sectors; whereas the Commission should take account of the regulatory frameworks of non-EU countries leading in the biotechnology and biomanufacturing sector, in the context of existing and future EU legislation covering the industry, to ensure compatibility without lowering existing EU safety and environmental standards;

L. whereas the EU's biotechnology and biomanufacturing investment and venture capital ecosystem remains fragmented; whereas high energy prices, regulatory burdens, barriers, and a lack of available key feedstock, raw materials and components are limiting the ability of start-ups and other small and medium-sized enterprises (SMEs) to scale up, and limit large-scale deployment; whereas EU biomanufacturing capacity and supply chain resilience, including the availability of feedstock, are essential to reduce dependence on non-EU actors; whereas effective global supply chains – including strategic partnerships with reliable global actors – are also important to secure stable access to critical resources, avoid supply disruptions and foster continuous innovation in essential technologies;

M. whereas bio-based feedstocks, such as sustainably sourced biomass, recycled waste and CO_2 captured from biogenic sources, could be used as alternative feedstocks for the manufacturing of, for example, polymers, plastics, solvents, paints, detergents, cosmetics and pharmaceuticals, thereby contributing to EU emission reduction, resource efficiency and strategic autonomy; whereas the EU could further incentivise market demand and market uptake for sustainable bio-based products and materials;

N. whereas it is vital to increase the use of sustainable bio-based raw materials as part of the means of reaching the EU's 2050 climate targets; whereas biotechnology has the potential to transform the refinery and chemical industry towards biomanufacturing, thereby reducing greenhouse gas emissions, in line with the EU's climate objectives;

O. whereas biotechnology and biomanufacturing are regulated across many different regulatory frameworks; whereas current EU regulatory frameworks for biotechnology and biomanufacturing are inconsistent across sectors, creating legal uncertainty and slowing market access for innovative solutions; whereas the lengthy authorisation processes, particularly concerning approval times, need to be urgently addressed and improved, while maintaining a risk- and science-based approach, to compete with corresponding time frames outside the EU; whereas the use of regulatory

sandboxes should be expanded to ensure that emerging technologies have a clear development pathway; whereas new EU-wide regulation in the form of an EU biotech act should be duly justified based on examples of concrete gaps and shortcomings in current legislation and implementation, focusing on the specificities of the industry;

P. whereas a coherent, robust and future-proof intellectual property (IP) framework is essential, ideally resulting in economic, environmental and societal benefits;

Q. whereas public awareness in the EU of biotechnology and biomanufactured products should be further strengthened, in order to boost public acceptance; whereas the ethical aspects of biotechnology should be considered; whereas stakeholder consultation plays a crucial role in shaping responsible and ethical biotechnology policies; whereas civil society can play an essential role in ensuring public trust;

R. whereas the engineering of DNA and organisms is increasingly carried out in automated biofoundries, which produce a wealth of data and improved designs and knowledge of biological functions;

S. whereas the EU's regulatory framework needs to adequately address evolving risks, opportunities and responsibilities associated with the handling, trade and synthesis of biological material, particularly in the context of synthetic biology; whereas existing biosecurity gaps need to be addressed by the EU and through international cooperation;

Criteria for a comprehensive EU biotech act

1. Emphasises the growth potential of the European biotechnology and biomanufacturing sector and the need for the EU to remain world-leading in this field; underlines the commitment to the principles of better regulation and lawmaking, simplification and administrative burden reduction; underlines that the simplification of EU legislation must not endanger any of the fundamental rights of citizens, workers and businesses or risk regulatory uncertainty; believes that any simplification proposal should not be rushed and proposed without proper consideration, consultation and impact assessments; therefore asks the Commission, if it proposes a new EU-wide regulation in the form of an EU biotech act, to address concrete gaps and shortcomings in current legislation and implementation, and to present legislation that can be revised, simplified, streamlined, repealed and which reduces bureaucratic burdens, focusing on the specificities of the industry and maintaining relevant safety and security standards; asks that an EU biotech act adopt a comprehensive cross-sectoral scope and that it be accompanied by an impact and cost assessment, competitiveness checks as well as a comprehensive assessment by the Regulatory Scrutiny Board, taking

due consideration of the impact on SMEs, start-ups and scale-ups, as well as the interaction with other relevant legislative and non-legislative initiatives, including proposals currently undergoing the co-legislative procedure;

2. Recalls that according to the OECD, biotechnology is defined as the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services; notes, however, that biomanufacturing is not clearly defined and calls on the Commission to propose such a definition;

3. Recommends streamlining and harmonising existing and upcoming initiatives relating to biotechnology and biomanufacturing, with the objective of strengthening the biotechnology and biomanufacturing industry through clear industrial and research and development (R & D) competences;

4. Urges the Commission to ensure coherence and consistency across all initiatives and legislative measures that may affect biotechnology and biomanufacturing innovations and companies, especially start-ups and scale-ups;

5. Calls on the Commission to ensure that any future relevant legislative initiatives have a broad enough scope to capture the width of the biotechnology and biomanufacturing industry and its full range of applications; recommends facilitating a fast and efficient uptake of biotechnology and biomanufacturing through clear regulatory frameworks;

6. Calls on the Commission to implement measures within its structures in order to ensure coordination, coherence and complementarity across its relevant directorates-general, and to enable more efficient scale-up and commercialisation of research, development and innovation results; highlights the importance of efforts to improve policy coherence and coordination at national level;

7. Calls on the Commission to take account of regulatory frameworks of non-EU countries leading in the biotechnology and biomanufacturing sector, in the context of existing and future EU legislation covering the industry, to ensure compatibility, where possible and without compromising consumer safety, and a level playing field for EU biotech companies competing internationally, and to learn from best practices from outside the EU without lowering existing EU standards;

8. Calls on the Commission to present a report on the implementation of current legislation in the field of biotechnology and biomanufacturing, including identifying potential gaps and regulatory barriers hampering the growth of the industries applying these technologies and manufacturing processes, including barriers

to improving the EU's self-sufficiency in key feedstocks, raw materials and components; recalls the precautionary principle laid down in Article 191 TFEU; urges the Commission to share with Parliament the preliminary findings of its study on regulatory burden, in this regard, and the potential need to review legislation related to biotechnology and biomanufacturing; calls for a simplification of current requirements for the sector across regulatory frameworks to enable faster approval procedures and market access, while maintaining a risk- and science-based approach and avoiding regulatory uncertainty;

9. Welcomes the recently launched Biotech and Biomanufacturing Hub; requests that the Commission provide further guidance to EU biotechnology and biomanufacturing companies and the Member States with regard to the Net-Zero Industry Act[1] and the new Clean Industrial Deal in terms of permitting and financing, and to consider the creation of supporting hubs, in order to improve guidance and advice to companies navigating through the regulatory framework;

10. Calls on the Commission to urgently streamline, simplify and shorten the time required for authorisation procedures, particularly approval time frames, for biotechnology materials and products throughout their manufacturing- and life-cycles, and to facilitate the market uptake of bio-based solutions, including the provision of pre-authorisation guidance, while maintaining a risk- and science-based approach, particularly in the context of its regular review of EU agencies such as the European Food Safety Authority, the European Medicines Agency and the European Chemicals Agency; calls on the Commission to ensure that the relevant EU agencies are adequately resourced, to enhance their capacity for conducting authorisation procedures in a timely manner;

11. Calls on the Commission to consider the possibility of a simplified approvals procedure for biotechnology products that have already been approved by trusted regulatory bodies in like-minded countries with EU-equivalent standards;

12. Calls on the Commission to consider simplifying labelling practices, such as the use of QR codes, and ensure fair market conditions between biotechnology and other products, such as marketing and advertising, without compromising consumer safety or access to relevant consumer information;

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1 Regulation (EU) 2024/1735 of the European Parliament and of the Council of 13 June 2024 on establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem and amending Regulation (EU) 2018/1724 (OJ L, 2024/1735, 28.6.2024, ELI: http://data.europa.eu/eli/reg/2024/1735/oj).

13. Recalls that harmonised, predictable, future-proof and internationally competitive IP and data protection rules for biotechnology and biomanufacturing patents are essential for the development of the industry, resilient supply chains and sustainable economic growth; underlines the importance of improving IP protection rules by longer terms for patented technologies to strengthen the EU's competitiveness, foster innovation and the EU's strategic autonomy, protect cutting-edge technologies, reward long-term investments, and support high-risk research; considers that a coherent, robust and future-proof IP framework is essential; welcomes, in this regard, the EU's recently established unitary patent system;

14. Calls for a common clinical trials framework with streamlined approval procedures across the Member States to minimise administrative burdens and delays, and which allows for the use of real-world evidence for biotechnology therapies; asks the Commission to present the current situation in this regard, as well as potential improvements; calls for the swift implementation of the Clinical Trials Regulation[1] and the use of the EU's Clinical Trials Information System;

15. Underlines the strategic importance for the EU of a strong biotechnology ecosystem to support R & D, manufacturing, and patient access to innovative medicines; points out that biotechnology processes can be used to manufacture active pharmaceutical ingredients and key manufacturing inputs for both off-patent and innovative medicines;

16. Recommends using the next generation of regulatory sandboxes to assess the specific impacts and possibilities of emerging biotechnology and biomanufacturing applications, ensuring that new technologies can be trialled in a controlled but flexible and future-proof regulatory environment; stresses the importance of ensuring that EU policy takes account of technological and scientific developments to safeguard the EU's global competitiveness;

17. Recommends developing a strategy to support biotechnology and biomanufacturing companies transitioning from the regulatory sandbox regime to full market access; requests that the strategy include, but not be limited to, support mechanisms, regulatory assistance and guidance on compliance with EU legislation;

The need to promote the advantages and specificities of the biotechnology and biomanufacturing industry

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[1] Regulation (EU) No 536/2014 of the European Parliament and of the Council of 16 April 2014 on clinical trials on medicinal products for human use, and repealing Directive 2001/20/EC (OJ L 158, 27.5.2014, p. 1, ELI: http://data.europa.eu/eli/reg/2014/536/oj).

18. Underlines that effectively scaling up biotechnology and biomanufacturing in the EU hinges on a robust, competitive and circular bioeconomy; calls on the Commission to present an updated bioeconomy strategy, which takes account of current challenges and reinforces the bioeconomy's industrial dimension and its links to biotechnology and biomanufacturing, incentivising the development and production of sustainable, innovative, high-value added bio-based materials, products and solutions, to contribute to EU competitiveness and strategic autonomy;

19. Acknowledges the important role biomass plays in biomanufacturing; recalls, in this regard, the importance of adopting an approach open to different sustainable biomass technologies grounded in robust analysis, and with the aim of enhancing feedstock access and use, as well as harnessing international supply chains, while aiming to avoid unintended environmental externalities;

20. Underlines the need to account for the specificities of biogenic carbon, bio-based products and processes, and to differentiate them from petrochemical and fossil-based products, in the context of EU and national chemical, materials and environmental legislation;

21. Points out that essential components, such as enzymes, lactic acid bacteria and other microorganisms, run the risk of being prohibited or unduly disincentivised by EU regulations primarily designed for petrochemical and synthetic substances, such as the REACH Regulation[1];

22. Is concerned that the European Investment Bank (EIB)'s interpretation of sustainability criteria under the EIB Group Paris alignment framework may result in access to funding for bio-based materials and projects being denied; asks the Commission to examine relevant definitions accordingly and encourage biotechnology- and biomanufacturing-friendly interpretations; calls on the EIB to propose de-risking instruments for biotechnology and biomanufacturing, in order to raise capital; calls, moreover, on the EIB to improve outreach, advisory support and information on financing instruments and opportunities for eligible biotechnology and biomanufacturing projects, in particular SMEs, start-ups and scale-ups;

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1 Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396, 30.12.2006, p. 1, ELI: http://data.europa.eu/eli/reg/2006/1907/oj).

23. Underlines the benefit and contribution of bio-based products and processes to the EU's CO_2 reduction objectives, which, given the potential of these products to increase sustainability and lower the EU's environmental footprint, need to be reflected in respective life cycle assessments, information for consumers and public procurement;

24. Considers that, in order to accelerate the substitution of fossil-based feedstocks, the market demand and market uptake of sustainable bio-based products could be further incentivised in the EU; considers that bio-based feedstocks, such as sustainably sourced biomass, recycled waste and CO_2 captured from biogenic sources, could be used as alternative feedstocks for the manufacturing of various products, contributing to the EU's emissions reduction, resource efficiency and strategic autonomy; in this context, recalls the commitment in the EU's Competitiveness Compass to develop policies to reward early movers; considers that coherent and adequate sustainability criteria should be ensured for biomass;

25. Underlines the importance of upholding the EU's high standards of food and consumer safety and the potential of biotechnology applications when assessing biotechnology applications in food and feed to protect consumer health, assess impact on circularity and sustainability, and to consider social, ethical, economic, environmental and cultural aspects of food innovation; calls on the Commission to identify smooth routes to market for safe applications of biotechnology in food products, while reiterating that such biotechnology applications need to be properly examined, prior to any future authorisation and subsequent placing on the EU market, including gathering toxicological information and clinical and pre-clinical studies where relevant, and ensuring traceability;

26. Underlines that biosecurity risks, including bioethical considerations, must be addressed in conjunction with biotechnology and biomanufacturing innovation, ensuring responsible access to and use of synthetic biology tools, genetic editing technologies and biological materials; calls for the establishment of an EU biosecurity registry for synthetic DNA, benchtop synthesis equipment and genetic engineering tools, improving transparency and risk-assessment mechanisms, in consultation with relevant stakeholders, such as industry and civil society, and while ensuring sensitive data is adequately protected; stresses the importance of EU strategic autonomy in biotechnology supply chains, ensuring that critical biomanufacturing inputs and expertise remain within Europe; calls for stronger international cooperation on biosecurity standards, including mandatory international screening standards, ensuring that EU-based biotechnology and biomanufacturing companies benefit from global best practice while maintaining competitiveness;

27. Urges the Commission to conduct a study on biological materials and to present an updated communication and an action plan on chemical, biological, radiological and nuclear risks, in particular regarding bioterrorism and bio-risks;

Horizontal issues

28. Underlines the importance for supply chain security of ensuring a sufficient, stable and competitive supply of feedstock, raw materials and essential components, such as sustainable biomass and enzymes for biotechnology and biomanufacturing companies; calls for potential risks, gaps and dependencies to be closely monitored while safeguarding company-sensitive data and the functioning of the internal market;

29. Stresses the importance of developing EU raw material value chains and manufacturing, and enhancing self-sufficiency where possible, while also fostering strategic partnerships and cooperation with like-minded non-EU countries to secure resilient and diversified access to critical inputs of biotechnology and biomanufacturing industries in the EU;

30. Stresses that, in an increasingly tense geopolitical context, biotechnology and biomanufacturing should be fully leveraged to strengthen the EU's strategic autonomy, enhance food security and reduce dependence on non-EU countries; highlights the need to stimulate market demand and uptake of bio-based products to boost the growth, competitiveness and sustainability of the EU biotechnology and biomanufacturing sector;

31. Notes that the scale-up and commercialisation of research results remains a major challenge in the EU, and stresses the need to improve knowledge and technology transfer between academia and industry to ensure that EU-funded biotechnology and biomanufacturing research leads to commercial applications and industrial deployment; highlights the importance of strengthening public-private collaboration and supporting universities and research institutions with high levels of technology transfer, spin-offs, and start-up creation, for example by applying the CERN model of building start-up studios within research institutions; calls for strategic investments in shared EU infrastructure – such as pilot facilities, biobanks or innovation accelerators – to support the scale-up of prototypes and the market uptake of innovative biotechnology and biomanufacturing solutions; underlines that innovation cannot solely take place for short-term economic benefit, and that biotechnology and biomanufacturing innovation should be driven through a bottom-up approach under a standalone and long-term framework programme; calls on the Commission to facilitate the creation of world-leading research hubs for biotechnology and biomanufacturing to drive innovation and collaboration between

academia, industry and venture capital; emphasises the need for robust physical testing facilities in the biotechnology and biomanufacturing sector to drive innovation and facilitate the production and market access for SMEs and start-ups;

32. Stresses the need to ensure access to affordable energy for biotechnology and biomanufacturing operators, given the high energy intensity of large-scale biological production processes; underlines the importance of facilitating the authorisation and validation of large industrial plants, such as bioreactors, which are essential for scale-up but also face significant construction and operating risks; welcomes the latest revision of the Renewable Energy Directive[1] and its provisions to simplify permitting procedures, and calls on the Member States to swiftly implement relevant measures to support the deployment of biotechnology and biomanufacturing infrastructure;

33. Underlines the need for a skilled and diverse European workforce in the biotechnology and biomanufacturing sector and for the promotion of entrepreneurial skills, in close collaboration with industry and research institutions; calls for increased investment in biotechnology and biomanufacturing education and targeted professional training, including in but not limited to areas such as regulatory compliance, quality assurance and process engineering; supports the development of competence centres and public-private training initiatives across all Member States to enable upskilling, reskilling and lifelong learning to safeguard the attractiveness of the biotechnology and biomanufacturing industry; highlights the importance of adapting educational curricula to the evolving needs of the sector, and of promoting science, technology, engineering and mathematics (STEM) subjects, with a particular focus on attracting more girls and women into biotechnology and biomanufacturing careers; encourages more public awareness about career opportunities in the field to attract talent from non-EU countries and suggests exploring the potential for transatlantic cooperation; welcomes the recently launched Choose Europe for Science pilot scheme to attract top non-EU researchers, scientists and academics to Europe;

34. Calls for the urgent completion of the capital markets union to attract institutional investors to the biotechnology and biomanufacturing industry, including venture capital, pension funds and private equity; underlines that the sector is characterised by

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[1] Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 (OJ L, 2023/2413, 31.10.2023, ELI: http://data.europa.eu/eli/dir/2023/2413/oj).

high levels of risk and that reducing the cost of failure in the EU is necessary for attracting large-scale capital investment; calls for dedicated support to ensure that biotechnology and biomanufacturing SMEs, start-ups and scale-ups can access sufficient funding and compete globally; stresses that cross-border investment barriers must be reduced to facilitate investment in biotechnology and biomanufacturing scale-ups;

35. Notes that public-private partnerships and mission-driven EU investment strategies, such as the Circular Bio-based Europe Joint Undertaking, are essential for de-risking biotechnology and biomanufacturing innovation and for increasing the likelihood that IP and industrial capacity remain in Europe; urges EU investment instruments, such as the InvestEU programme, to be strengthened to support biotechnology and biomanufacturing projects considered as high-risk from an investment perspective; underlines that the sector is characterised by a high concentration of SMEs, which face disproportionate barriers in accessing capital despite being critical drivers of innovation; supports the exploration of a biotechnology Important Project of Common European Interest to facilitate industrial deployment and first-mover investments in bio-based chemicals, materials, and products and solutions;

36. Notes that public awareness of biotechnology and biomanufactured products in the EU should be further strengthened to boost public acceptance; recommends engaging with citizens and civil society organisations to communicate the characteristics, benefits and implications of the growing presence of biotechnology-based products and services in the European market;

Future-proof research and innovation

37. Regrets that European private investment in research, development and innovation is lagging behind other major economies and that the scale-up and commercialisation of research results remain a major challenge in Europe; highlights the fact that European and national public systems for R & D funding remain complex and insufficiently coordinated, resulting in duplications and inefficiencies; calls for an EU-wide approach to coordinating public investment in R & D for biotechnology and biomanufacturing, with the dual objective of closing excellence and innovation gaps and accelerating commercialisation; underlines the importance of strengthening European collaboration, pooling knowledge and resources, and leveraging public funding with private investment; recalls the key role of framework programmes such as Horizon Europe in fostering scientific excellence, innovation and technical development and calls for targeted investment in strategic biotechnology and biomanufacturing subfields, such as industrial, environmental, marine, health and agri-food biotechnology;

38. Reiterates the call to double the EU’s research budget and to reach the target of 3 % of EU gross domestic product being devoted to R & D by 2030;

39. Notes the growing role of synthetic biology, bioinformatics, data and game-changing AI-driven biotechnology and biomanufacturing research; calls on the Commission to integrate biotechnology and biomanufacturing innovation into the EU digital and AI strategies, ensuring interoperability between biotechnology and biomanufacturing data infrastructure and AI-driven discovery platforms; notes that AI capabilities are dependent on the efficient use of data; considers that the creation of industrial data spaces for biotechnology and biomanufacturing is important for efficient data sharing;

40. Acknowledges that, while AI systems and quantum computing can significantly speed up research and lead to new innovations, enabling better computational designs of biological systems, they can also increase the risk of biological threats; underlines, therefore, the need to apply a risk-based approach to the use of AI in scientific research and manufacturing;

41. Considers that the ethical use of AI, bioinformatics and synthetic biology is crucial for building trust and for society at large to benefit from these technologies; underlines the need to safeguard data privacy, data security, transparency and human oversight of the use of AI systems in the health biotechnology sector;

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42. Instructs its President to forward this resolution to the Council and the Commission.