

Strategic Outlook 2025–2028





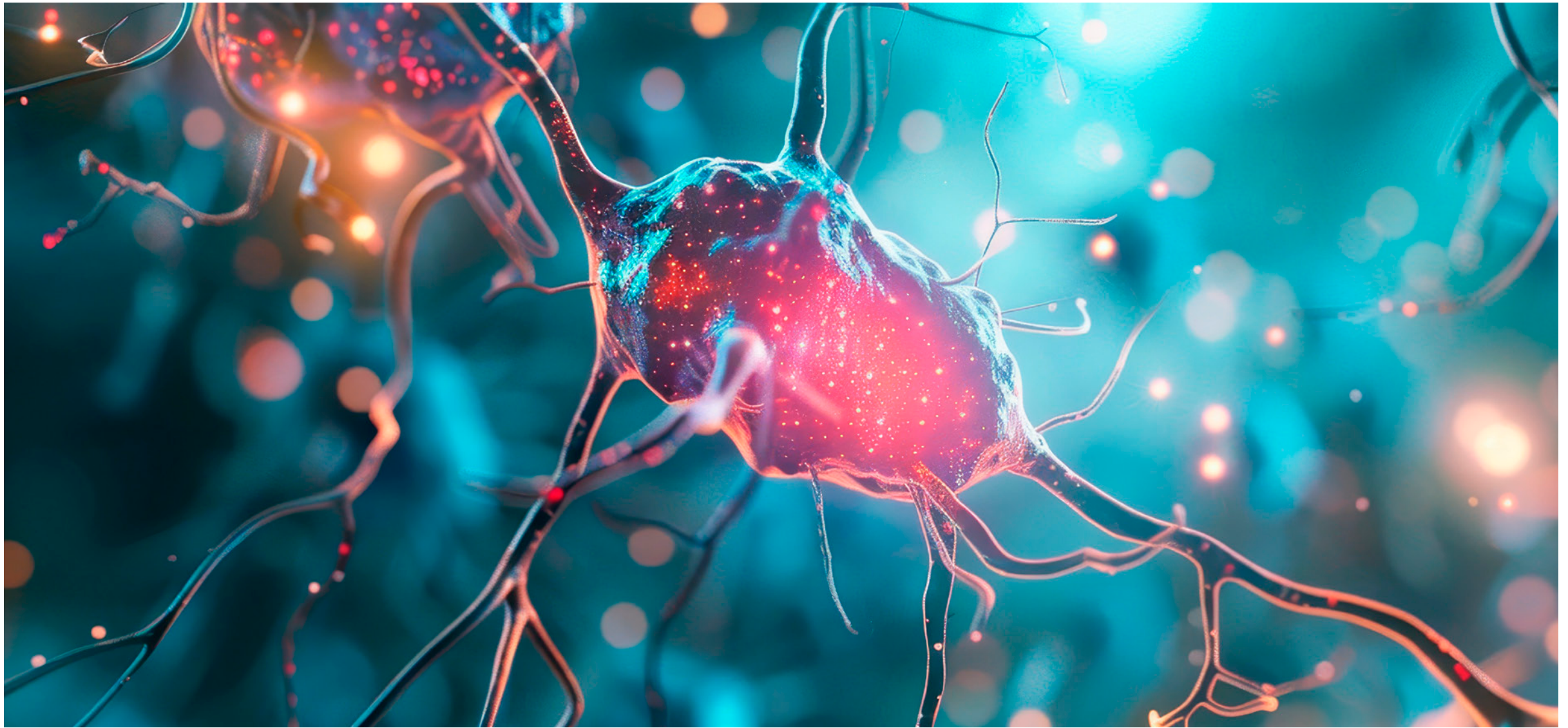
PSI is the largest research institute for natural and engineering sciences in Switzerland and internationally renowned for hosting a unique suite of large research facilities, available to a national and international user community. Through continuous development, PSI ensures the international competitiveness of these research infrastructures and guarantees their maximum availability to the user community from research and industry.

PSI performs world-class, mission-driven research in four main areas: future technologies, energy and climate, health innovation, and fundamentals of nature. By conducting fundamental and applied research across the entire innovation chain, PSI works on important contributions to the fundamental understanding of matter, to innovation and sustainable development of industry as well as on long-term solutions for major challenges facing society. PSI is systematically expanding the use of artificial intelligence and machine learning in all its research areas. As part of the research community, PSI lives by the principles of scientific integrity and open science, promotes ethical behaviour, and raises awareness among its employees with regard to knowledge security.

PSI plays an important role in the educational system of the ETH Domain by providing research-based teaching that expands and further diversifies teaching offers at the two Swiss Federal Institutes of Technology, Swiss and foreign Universities, and the Universities of Applied Sciences and by supporting the education of Bachelor, Master, or jointly supervised PhD students. PSI engages in vocational training as part of the Swiss apprenticeship system and thus makes an important contribution to alleviating the already pronounced shortage of skilled labour, particularly in the technical fields. About a quarter of PSI's workforce consists of people in training or qualification positions, from apprentices to post-doctoral fellows.

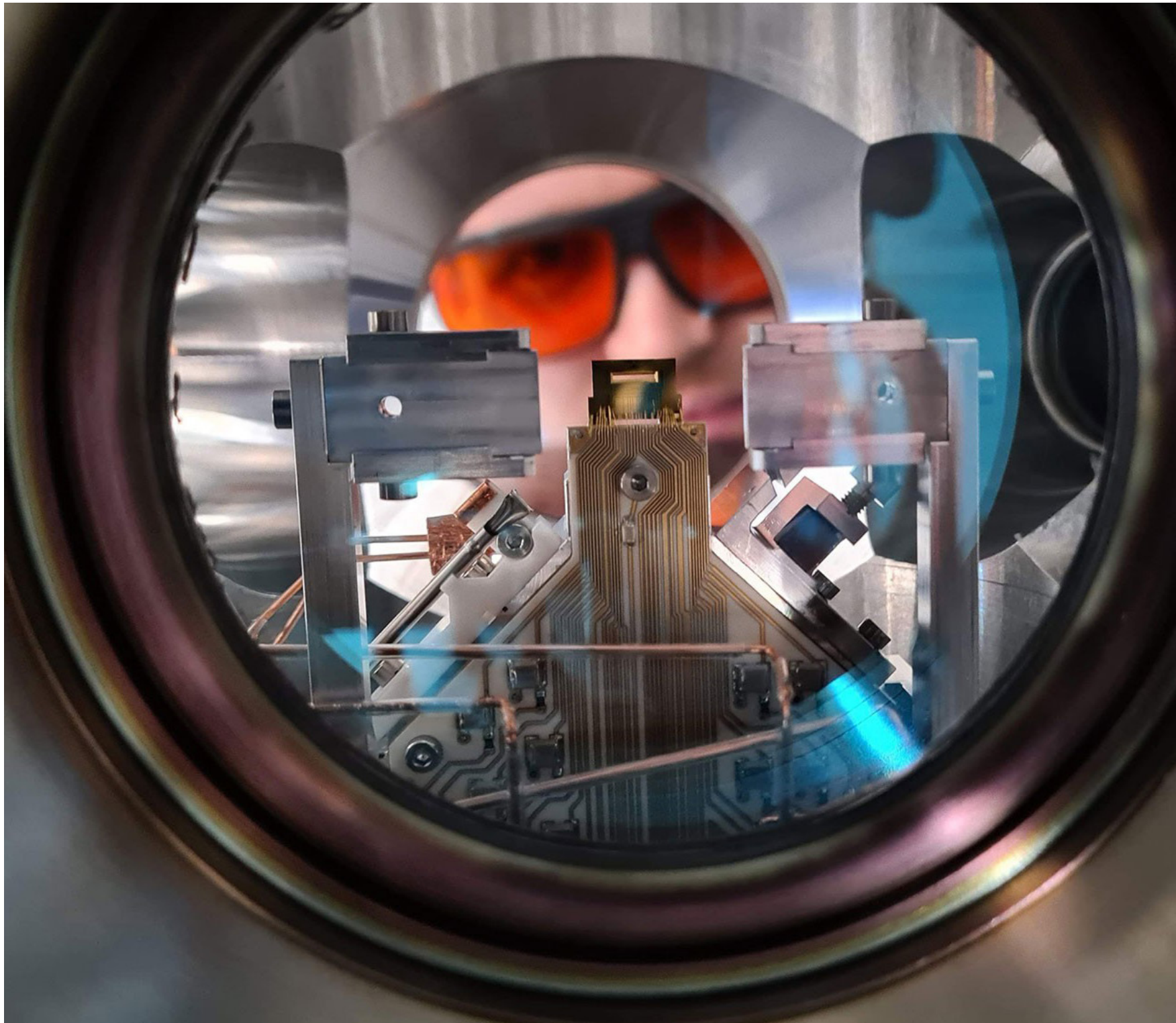
The output of fundamental and applied research activities and technologies developed at PSI contribute to the sustainable strengthening of Switzerland's competitiveness as one of the most innovative countries in the world. To this end, PSI strives to transfer its knowledge and technologies to Swiss industry, especially small or medium-sized enterprises (SMEs), to bring new innovations to market. Close collaborations with research institutes, universities, and industry intensify knowledge transfer through the migration of educated people, the training of professionals, and the transfer of technologies, patents, and licences, as well as the creation of spin-off companies.

PSI's excellent reputation is based on the outstanding technical and scientific expertise of our employees, research of high societal relevance, an internationally unique combination of leading large research facilities and close cooperation with Swiss industry. For the planning period 2025 – 2028 PSI has defined strategic priorities, which are presented here.



Fundamentals of Nature

- Further explore physics beyond the Standard Model: at PSI (fundamental particle physics experiments) and at CERN (e.g., detector development for High Luminosity Large Hadron Collider for CMS experiment)
- Experimental study of quantum phenomena under extreme conditions (temperature, pressure, magnetic fields) and of fast dynamic processes in physics, chemistry, and biology
- Quantum Matter and Materials Discovery Center (QMMC) to be established as focal point for research into materials with novel properties (fabrication and characterisation), start of operation in 2025/26
- Theoretical and computational research in a wide array of technology-inspired topics, e.g., quantum magnetism, correlated electrons, superconductivity, or topological insulators together with ETH Zurich and EPFL
- Investigation of fundamental mechanisms in nature, e.g., cell division, signalling or how physiological processes are controlled through structure and dynamics of proteins



Future Technologies

- Quantum Technology: design, manufacture, integration, and utilisation of quantum devices for information technology together with ETH Zurich and EPFL
- Semiconductor and Photonics Technology: exploring the capabilities of SLS 2.0 and Park Innovaare for collaboration with industry
- Development of superconducting magnets for future accelerators, e.g., Future Circular Collider at CERN, medicine and fusion
- Boosting the application of Artificial Intelligence and Machine Learning techniques to a variety of PSI's research fields
- Develop computational capabilities required to understand materials studies at PSI's large research facilities and engineering and safety solutions

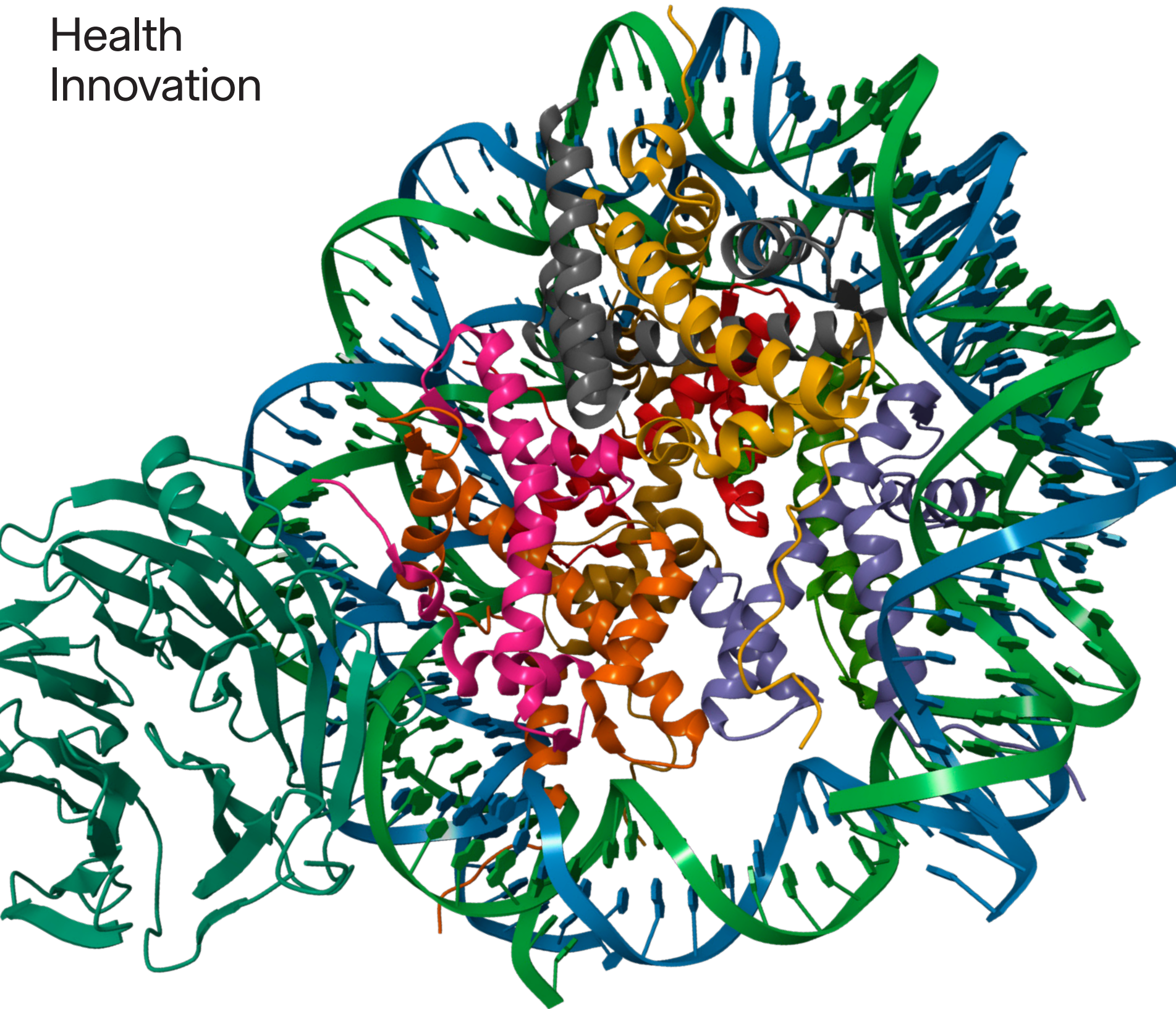
Energy and Climate

PSI will strengthen its leadership role in energy and climate research by exploring its unique infrastructure and know-how

- PSI as leading house of SURE (SWEET Programme), DeCIRRA (Innosuisse Flagship), SCENE (Joint Initiative of the ETH Domain)
- PSI as project partner in the Coalition for Green Energy and Storage CGES (with ETH Zurich, EPFL, Empa and industry)
- Fundamental research on emerging nuclear technologies (Gen-IV) for applications on earth and in space
- ACTRISERIC (European Research Infrastructure Consortium), Phase 2: the Swiss node will be transferred to full operation
- Studies on impact of the energy system transformation on climate and health



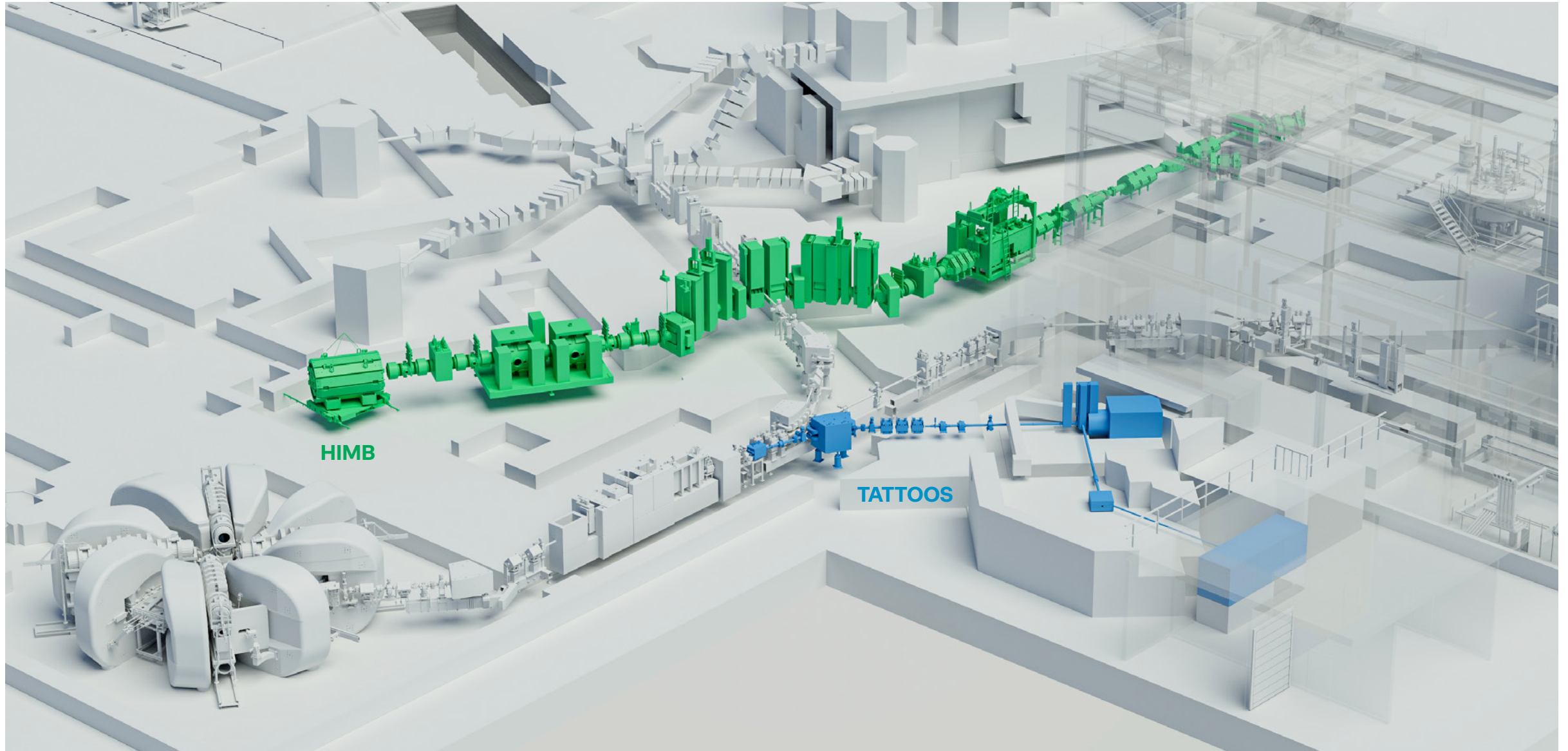
Health Innovation



- Imaging: SLS 2.0 upgrade and new tomography beamline will significantly improve imaging capabilities of biological samples; NIH BRAIN initiative to study the connectome (wiring of brain cells)
- Dynamic structural biology of proteins with biomedical and pharmacological relevance using SwissFEL and SLS 2.0
- Radiopharmacy: developing more effective combination therapies and links to industry
- Proton therapy: advocate for the inclusion of new indications and updated cost-covering tariffs; clinical collaborations
- New partnership programme (ForME fellowships) with partner hospitals to accelerate the translation of medical research into clinical application

Large research facilities and platforms

- SLS 2.0: start of user operation followed by ESup programme for beamline upgrade
- Realisation of IMPACT for muon production (HIMB, until 2028) and medical isotopes (TATTOOS, until 2030)
- Pre-study SwissFEL+: technology development and preparation of realisation (planned for 2029–2032)
- Co-develop SDSC and its hub at PSI and transformation into the national research infrastructure SDSC+
- Successful operation and expansion of platforms:
 - Energy System Integration Platform: from 2025 with a new pilot facility for production of synthetic aviation fuel
- ETH-PSI Quantum Computing Hub: full exploitation of new cleanroom and micro-/nanofabrication facilities at Park Innovaare to realise a 100 Qbit system in Switzerland
- Establish the European Space Deep-Tech Innovation Centre (ESDI) in collaboration with ESA and the ETH Domain



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