Healthcare and Life Sciences

This macro area concerns **healthcare technologies**, products and services including the development and production of drugs, food supplements and in vitro diagnostic devices. It also deals with technologies, equipment and systems to support healthcare and quality of life and to support disabilities and frailties as well as prevention, education, screening, diagnosis, therapy, assistance, rehabilitation and the management of health structures and systems.

In general, this sector is strategic not only from the point of view of the economic and employment potential, which is also high, but above all, for its social value; indeed, the offer of quality, high-tech products and services has immediate repercussions on the health and well-being of citizens.

The sector is constantly evolving, but Regione Liguria has identified in this area of specialization the sub-sectors with the greatest potential for generating innovation and economic development, considering the demographic and social peculiarities of Liguria and the needs of the regional healthcare and social services.

SYNTHESIS FRAMEWORK

HEALTHCARE AND LIFE SCIENCES

R&D system specialisation level	Very High

Local needs	• New needs for social and health care linked to the demographic structure of the population. • Paradigm shift, from a medicine based on diagnosis and treatments to the Medicine of the 4Ps: Predictive, Preventive, Personalized and Participatory. • Rethinking and reorganizing the health system according to the conformation of Liguria territory. • Need to develop solid, interoperable and secure IT infrastructures for the management of increasingly numerous and complex healthcare data and processes.
Strengths and competitiveness of the territory	• Excellence network with consolidated technical-scientific and industrial chain relationships and collaborations between the business system and the world of public research • Good competitive positioning at national and international level of research activities • High design capacity at national and international level • Presence of spin-offs and companies of excellence • Specialisation in the production of electro medical and electrotherapeutic equipment, software systems for managing healthcare systems; drugs, reagents, pharmaceutical intermediates, food supplements and nutraceuticals; scientific research in all biomedical technologies areas • Consistency with strategic agendas at EU and national level • Availability of qualified personnel
Impact	The impact of technological and industrial solutions related to the Specialization Area is very broad and involves the following sectors: • Environment • Biosensors • Green Chemistry • Electronics and IT

	• Mechanics (instrumental and precision) • Domotics
Territorial pervasiveness	Whole region
Sub-sectors	**Technologies for regenerative, predictive and personalized medicine** ▪ Regenerative medicine and in vitro models for personalized and predictive medicine, with a focus to personalized medicine for rare diseases ▪ Industrial biotechnology ▪ Functional tests and trials to support the identification of new pharmacological therapies, new targets, alternative "*drug delivery*" and pharmacological *repurposing* with reference to orphan diseases ▪ AI applications in health and *Digital Twin* development **Diagnostic platforms and technologies in omics** • Diagnostic imaging systems • Data-driven diagnostic process management models • *Smart devices and sensors* • Technologies and materials for diagnostic and analytical devices and 2D/3D models for diseases study, including new humanized chimeric models.

	Robotics and innovative technologies applied to rehabilitation, care, integration and education. • Technological aids to support the independence of people with sensory, motor and cognitive disabilities. • Technologies and systems for the social, educational, occupational integration and accessible tourism of people with special needs • Technologies and systems for continuous training, for advanced simulation and *patient empowerment* **Technologies and methods for the use and enhancement of Big Data in healthcare** • Acquisition and management of large amounts of medical data • Analysis and interpretation of biomedical data • IT security and health information privacy • Development and implementation of disease registries, creation of epidemiological and management models • New models of organisation, management, development and valorisation (transfer) of research from and within the territory **Healthcare information systems and infrastructures** • Unified computational *framework* to harmonize architectures, models and applications for the interoperability of usability-oriented processes and data, architectures, models and applications for the interoperability of processes and data. • *Cybersecurity* development of remotely accessible technologically advanced medical devices (implantable, wearable, diagnostic and therapy) and IT systems (for non-MD functionalities)