# Sector: Bioscience, Health and Pharmaceuticals

# Areas of Intervention & Priorities 2021-2027

| Areas of Intervention | Priorities |
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| **5.1 Development of supergenerics, of high value-added medicines (chemical molecules, biosimilars, radiopharmaceuticals, pharmaceutical products of natural origin) and optimization of existing products.** | 5.1.1 Products for which there are not approved generics or high value-added medicines available on the Greek market |
| | 5.1.2 Optimization of existing products (modified concentrations of active ingredients in medicines, new pharmaceutical dosage forms, modification of pharmaceutical dosage form to improve patient cooperation/compliance, bioavailability and pharmacokinetic properties, qualitative composition of medicines by using different excipients, etc) |
| | 5.1.3 New medicines (small molecules and synthetic, plant-derived and biotechnological-microbial origin peptides, biosimilars), utilization of experimental/computational approaches for rapid screening against a specific macromolecular target) and identification of structure-function relationships |
| | 5.1.4 Advanced Therapy Medicinal Products (ATMPs) based on mRNA, genes, tissues or cells |
| | 5.1.5 Development and structural characterization of composite carriers for encapsulation of sensitive advanced therapy medicinal products (ATMPs) and for their delivery in target cells/tissues by using nanotechnologies and biophysical methods |
| | 5.1.6 Development of active pharmaceutical ingredients (APIs) for the production of finished pharmaceutical products, including natural origin APIs |
| | 5.1.7 Research, development and production of diagnostic and therapeutic agents and radiopharmaceuticals |
| | 5.1.8 Development of computational studies and use of supercomputer infrastructures for:<br>a) simulation of drug molecule structure and activity on pharmacological targets, and acceleration of new medicine discovery<br>b) development of predictive models for safety and efficacy using Artificial Intelligence (AI)<br>c) planning optimization and personalization of pharmacotherapy<br>d) medication dispensing error prevention, early adverse event detection and patient compliance in treatment |

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| | 5.1.9 Drug efficacy and safety studies in well-defined populations (pharmacoepidemiology-pharmacovigilance); understanding drug-induced disorders/conditions (pharmacogenomics, pharmacometabolomics and other -omic technologies) |
| **5.2 Development of drug-device combination products, drug delivery technologies and combination of technologies in targeted therapeutic solutions.** | 5.2.1 Development of drug container and packaging technologies |
| | 5.2.2 Development of drug delivery technologies and devices |
| | 5.2.3 Development of drug-device combination products for monitoring treatment in real-time, improving pharmaceutical care and enhancing patient compliance |
| | 5.2.4 Development of targeted therapeutic solutions through integration of different technologies and products in a single product |
| | 5.2.5 Development of drug delivery devices, including inhalers, infusion pump, prefilled syringes, dual chambers, injector pens, autoinjectors, transdermal patches, wearable injectors, etc. |
| | 5.2.6 Alternative delivery options offering advantages over the usual delivery route (e.g. transdermal drug delivery patch whose main advantages consist in avoiding first-pass effect in the liver and reducing fluctuation of doses, mucoadhesive substance delivery systems, etc.). |
| **5.3 Clinical Research, repurposing of well-known drug molecules for new therapeutic indications or new populations (indications for chronic conditions, for pediatric and geriatric populations, etc.)** | Clinical efficacy and safety trials (phases I-III) for: 1) new active substances to be used in clinical practice as diagnostic/therapeutic agents, 2) combinations of new and/or established active substances as diagnostic/therapeutic agents 3) established or new pharmaceutical formulations for new diagnostic or therapeutic indications |
| | 5.3.2 Clinical efficacy and safety trials (phases I-III) for retargeted drug treatments in populations not covered by the existing indication (e.g. children, seniors, etc.). |
| | 5.3.3 Developing a methodology and protocols for implementing interventions that improve compliance to chronic disease treatment |
| | 5.3.4 Preparation of clinical trials on the efficacy and/or complementarity of alternative therapies, not covered by the health system, for disease/symptom management |
| | 5.3.5 Development of protocols and standards for integrated care pathways based on the interdisciplinary collaboration among health professional specialties |
| | 5.3.6 Development of protocols and standards for evaluation of provided services based on patient satisfaction |

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| | 5.3.7 Development of protocols and standards in the context of behavioral medicine and social sciences for health behavior study and intervention (e.g. vaccination issues, screening tests, public health protection) |
| | 5.3.8 Conducting decentralized clinical trials; hybrid or entirely virtual approaches |
| | 5.3.9 Preclinical trials (for efficacy & safety) |
| **5.4 Medicinal products, functional foods, dietary supplements & cosmetics based on raw materials derived from Greek (land & sea) plants, marine organisms and microorganisms; optimal use of Greek biodiversity** | 5.4.1 Development of state-of-the-art processes for extraction and obtention of natural-origin bioactive extracts, of methods for bioactive molecule separation and isolation methods as well as for their semi-synthetic or synthetic preparation |
| | 5.4.2 Development of analysis methods for characterization of natural extracts and their products according to international standards |
| | 5.4.3 Combined application of omics technologies to accelerate discovery of bioactive natural products, find molecular markers, or conduct quality and safety control |
| | 5.4.4 Technology development (e.g. nanocarriers, supramolecular bioconjugate complexes) for incorporating natural ingredients in medicinal, food or cosmetic technology products |
| | 5.4.5 Conversions-bioconversions of natural products aimed at optimizing their properties (bioactive, physicochemical and sensory properties, etc.) to be used for the development of novel medicinal, cosmetic or dietary products |
| | 5.4.6 Use of Greek aromatic plants and natural products for the development of new cosmetic technology products |
| | 5.4.7 Preclinical and clinical efficacy & safety trials for medicinal products based on natural ingredients of terrestrial or marine origin |
| **5 5 e-Health: Services and Systems for Patients/Citizens and Health Professionals** | 5.5.1 Advanced systems to prevent potentially dangerous situations for chronic patients |
| | 5.5.2 Services and systems to support personalized approaches for chronic condition self-management |
| | 5.5.3 Services and systems to assess and support active, healthy and independent living for older adults |
| | 5.5.4 Decision- support systems (DSS) for identifying, preventing and/or monitoring adverse reactions to medicines |
| | 5.5.5 Advanced medical decision-support systems and electronic prescribing |
| | 5.5.6 Advanced incident triage systems |
| | 5.5.7 Telemedicine systems and interconnected health services |

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| | 5.5.8 Epidemiological surveillance & intervention systems |
| | 5.5.9 Services and advanced systems to support chronic disease prevention approaches |
| | 5.5.10 Services and advanced systems to protect citizen well-being |
| | 5.5.11 Development of national open access databases for improved management of medical and biological data |
| **5.6 Development of animal models of human disease and of processes/systems in the context of preclinical trials, and biomarker discovery** | 5.6.1 Development of new animal models for human diseases and of new processes/systems to be applied in platforms for preclinical testing on the activity and/or efficacy of drugs and for biomarker discovery |
| | 5.6.2 Optimization/modification of existing animal models for human diseases and of new processes/systems to be applied in platforms for preclinical testing on the activity and/or efficacy of drugs and for biomarker discovery |
| | 5.6.3 Development of novel, or modification of existing, methodologies and protocols using animal models to optimize establishment of drug safety at the preclinical level |
| | 5.6.4 Development of tissue organoids and animal models mimicking humans (humanized models, patient-derived xenografts) for pre-clinical studies |
| **5.7 Precision Medicine: identification, confirmation and utilization of new therapeutic targets, agents and biomarkers for the development of personalized diagnostic and therapeutic approaches.** | 5.7.1 Study of organ- and tissue-specific macromolecules to identify new therapeutic targets and diagnostic, prognostic and drug-response biomarkers (preclinical and clinical studies); personalized treatments based on biomarkers. |
| | 5.7.2 Personalized genomics, epigenomics, proteomics, metabolomics, structural analysis to understand how pharmaceutical products, the environment and lifestyle choices influence human health; clinical & molecular epidemiology, genetic & environmental toxicology; development of biomarkers for pollutant exposure |
| | 5.7.3 Genetic analysis of disease predisposition including cancer, rare diseases, chronic diseases, etc. |
| | 5.7.4 Utilization of genetic engineering or genetic modification to develop personalized gene and cell therapies (e.g. stem cell translational and preclinical research for disease treatment) |
| | 5.7.5 Personalized transplanted tumors and preclinical phetotypic disease models to confirm novel therapeutic approaches against cancer and other diseases |
| | 5.7.6 Utilization of innovative chemical biology methods (e.g. development of bioconjugates and other smart molecules for bioimaging, single-cell imaging, single-molecule assessment applications, etc.) to |

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| | identify and confirm new therapeutic targets, agents and biomarkers |
| | 5.7.7 The gut microbiome and other human body microbiomes explored as therapeutic targets, probiotics and disease biomarkers |
| | 5.7.8 Development of networks for (epi)genomics, proteomics, metabolomics, structural biology and high-level clinical analysis data integration, and utilization thereof for disease diagnosis, prognosis and treatment response |
| | 5.7.9 Digitalization of medical records in easy-to-use and secure databases |
| | 5.7.10 Tools/methods for management of large-scale biodata and visual analytics techniques for solving open problems in the context of large-scale biodata |
| | 5.7.11 Development and application of viral and bacterial infection models to identify biomarkers of sensitivity and resistance |
| | 5.7.12 Utilization of new therapeutic targets to develop novel personalized therapeutic approaches using experimental and computational studies on the structure and activity of pharmaceutical targets in order to accelerate discovery of new medicines for targeted therapies |
| **5.8 Development and clinical validation of innovative medical technology products** | 5.8.1 Non-invasive technology products |
| | 5.8.2 Invasive technology products (destined for body cavities, surgical-type, implantable technology products, etc.) |
| | 5.8.3 Active medical technology products (destined for diagnostic or monitoring purposes; therapeutic products with an integrated or incorporated diagnostic function; products designed to emit ionizing radiations for therapeutic purposes; software for provision of information to be used in diagnostic and/or therapeutic decision-making) |
| | 5.8.4. Specific medical technology products (products incorporating, as an integral part, a substance which, when used separately, could be characterized as a medicine; products manufactured utilizing tissues or cells of animal or human origin, or their derivatives which are not viable; products incorporating a nanomaterial or consisting of a nanomaterial, etc.) |
| **5.9 Development and clinical validation of innovative in-vitro diagnostic products** | 5.9.1 Technological products destined to be used for detecting the presence of an infectious agent or exposure to an infectious agent causing life-threatening disease; determining the infectious load of a life-threatening disease; detecting the presence of an infectious agent or exposure to an infectious agent in relation to blood, blood components, cells, tissues or organs, or their derivatives, in order to assess their suitability for transfusion, transplantation or administration of cells |

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| | 5.9.2 Technological products destined to be used for determining blood types or for determining tissue types in order to ensure immune compatibility of blood, blood components, cells, tissues or organs destined for transfusion, transplantation or administration of cells |
| | 5.9.3 Technological products destined for self-diagnosis |
| | 5.9.4 Technological products destined to be used for human genetic testing; as companion diagnostics; during presymptomatic screening, cancer diagnosis or staging; for monitoring the levels of drugs, substances or specific biological agents; for conducting presymptomatic testing for congenital disorders in embryons, fetuses or neonates; and for detecting the presence of, or exposure to, sexually transmitted infections |
| **5.10 Emerging technologies in the Health and Pharmaceuticals sector** | 5.10.1 Utilization of bioprinting technologies for biomolecules, cells, drugs, biosensors etc. |
| | 5.10.2 Systems biology: from genes and genomes to the integrative study of biological systems |
| | 5.10.3 Intensification of process automation and real-time monitoring of the drug manufacturing process |
| | 5.10.4 Focusing on the supply chain by applying sustainable development-oriented approaches |
| | 5.10.5 Self-measurement systems and digital assistants to support clinical trials |
| | 5.10.6 Advanced digital systems for pharmaceutical compliance monitoring and pharmacovigilance |
| | 5.10.7 Digital twins of physical-world systems and simultaneous development of automated feedback loops in machine learning |
| | 5.10.8 Establishment of a biobank and a cell collection center for clinical trials on cell therapies and/or hematopoieitic stem-cell transplantations |
| | 5.10.9 Establishment of a biobank for tissue collection related to diseases and characteristics common among the Greek population |
| | 5.10.10 Simulation of clinical and preclinical trials, including for predicting the in vivo/in-vitro behavior of drugs; exploring cases that cannot be tested in practice; assessing various circumstances; optimizing clinical planning; personalizing dosing, etc. |