



M E D I C N E S T

Deliverable 3.1 Short report of the outcomes of the analysis and update of the participant's strategies towards precision medicine with focus on Early Diagnosis and Smart Health Services

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ABSTRACT

This deliverable represents the work dedicated to analyze cluster potential to grow and innovate according to smart specialization strategies. This analysis will help identify complementarities and potential joint projects within the partnership.

STATEMENT OF ORIGINALITY

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

DISCLAIMER

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Table of contents

Introduction.....	4
1. Analysis in relation with the growth and innovation potential deriving from Smart Specialization Strategies.....	5
1.1. Members.....	5
1.2. Smart Specialization Strategies.....	6
2. Characterization of the Medic Nest Value Chain.....	13
3. Cross Sector Opportunities and competitiveness and the precision medicine market where the group operates.....	32
4. Addressing the upskilling and/or reskilling needs.....	33
5. Actions by Medic-Nest clusters towards precision medicine strategical uptake	34

Introduction

In order to create a meta-cluster strategy on precision medicine starting from four existing clusters, it is required to complete an analysis of each cluster and describe the ecosystems of each region based on individual strategies. Once the members are introduced, the document will go over the background of each cluster in relation to the RIS3 – Research and Innovation Smart Specialization Strategy they follow. As well as to characterize these bases for a better understanding: technological, industrial and market base.

It has been decided to make a cluster approach, and then develop common strategies (which will lead to the development of a meta-cluster strategy). The cluster approach is based on a SWOT analysis, which will help to establish actions, projects and potential further developments.

Finally, the report will present the strategic uptake of each MEDIC NEST cluster regarding precision medicine.

1. Analysis in relation with the growth and innovation potential deriving from Smart Specialization Strategies

1.1. Members

The **MEDIC-NEST** project aims to strengthen cluster management excellence and facilitate strategic partnering and exchange between clusters and specialized eco-systems across Europe in the field of precision medicine.

As a solid basis for realizing this ambition, MEDIC-NEST can rely on strong relations with existing regional, cross-regional or even European networks or alliances, already built by the individual partners. The members of the consortium are the following:

IMAGO-MOL (North East Regional Innovative Cluster for Structural and Molecular Imaging), the only medical imaging cluster in Romania and European Union, is a non-governmental, non-profit organization whose objectives are to support the growth of scientific competitiveness of its members and the economic competitiveness of North East Region in the field of medical imaging by developing a framework for cooperation targeting diversification and optimization of services in this specific area. Imago-Mol Cluster gathers under its umbrella promoters of research and development, innovation and education, hospitals, promoters of regional development, SMEs in the fields of ICT and health. It is active within European Cluster Alliance, via Romanian Clusters Association Clustero. Imago-Mol is an associated partner of Digital Innovation Zone, which is the Digital Innovation Hub from the North-East Region of Romania and newly elected e-DIH within the selection process of the European Commission.

MEDVIA , despite the fact it has been only recently founded, can rely on relationships with several European clusters via the networks of its founding member DSP Valley. Two of them are the Silicon Europe Alliance, a Meta cluster for the digital industry and the Smart City Tech Alliance, a meta cluster connecting the city stakeholders with the digital industry.

HBIO is the only biotechnology and Life Sciences cluster in Greece, currently with members across the whole sector including precision medicine. Specifically, HBIO is an active collaborator of the Centre of New Biotechnologies and Precision Medicine of the National & Kapodistrian University of Athens and the Greek Research Infrastructure for Personalized Medicine, supporting research and innovation towards next generation healthcare applications, as well as the Hellenic Network of Precision Medicine on Cancer. Apart from being a major connector and facilitator within the Greek ecosystem, HBIO is also actively involved in EU networks. HBIO is an active member of the Council of European BioRegions (CEBR) with a representative on the board of directors. CEBR is a membership-driven network of life science clusters across Europe, with approximately 40 subscription members and hundreds of cluster partners across the world. Together, CEBR represents and supports thousands of SMEs and hundreds of universities and research centres across the EU. Furthermore, HBIO is also a member of EuropaBio, which currently represents 47 corporate and associate members and bio regions, and 13 national biotechnology associations across the EU, promoting an innovative and dynamic European biotechnology industry.

The Association – Cluster – Innovative Solutions for Independent Living (SIVI), based in Castilla y León, brings together a significant number of public and private organizations (providers of socio-assistance services, technology companies, university research groups,

technology centers, health and biotech companies, and the third sector) with experience in the design, development and application of innovative technological solutions in the fields of active and healthy aging, mental health and independent living. The multisectoral nature of the cluster allows it to cover all stages of an innovation project: conception, design, development, testing in application groups, exploitation of results and marketing.

1.2. Smart Specialization Strategies

➤ IMAGO MOL

The scientific objectives of the cluster are:

- initiation and development of in vivo and in vitro medical studies, fundamental and applied. The studies follow physiological and pathological medical aspects through molecular, functional (eg scintigraphy) and structural imaging methods with adequate resolution (X-ray CT, MRI, ultrasound, etc.).
- development of a competitive molecular and structural medical imaging platform in the context of national and international imaging.

The strategic directions of action following RIS3 are the following:

The development of research-development-innovation activities through the realization of collaborative projects

- Realization of joint CDI projects (Regional system of teleAVC; antimicrobial resistance; development of medical software, through the collaboration between the 3 main actors: hospital - data provider, university - algorithm development, economic agent - application development; use of type applications machine learning, artificial intelligence and/or Big Data in order to develop software/hardware solutions, to improve imaging analysis in biomedical research);
- Creation of a common research infrastructure:
 - Nuclear Theranostic Center - focused on the interdisciplinary and complete management of patients;
 - Development of an infrastructure project for the implementation of the regional PACS network (USMED 2).
- Creation of a database to more easily transmit information between/to the cluster members and to contain data on: the incidence of different types of diseases that can be investigated through molecular imaging; biomarkers of different diseases; updating the database about biomarkers that can be useful for molecular and structural imaging.
- Attracting new members in order to expand the chain of suppliers;
- Promoting health and health education:
 - Educational programs to increase the capacity to identify and recognize stroke by the population;
 - Promotion of participation in screening programs.
 - Increasing the level of training and specific skills at the level of cluster members through training activities and exchange of experience
- Supporting researchers (training, participation in other scientific events) in order to develop new directions, for example the use of new radiolabeled particles/new radioactive isotopes in preclinical research;
- The specialization of local researchers in the field of radiochemistry and nuclear physics in order to benefit from the existing local infrastructure for the production of radioactive isotopes and radiotracers;

- Organization of courses, trainings, workshops by inviting renowned speakers in the field on the subject of pathological anatomy and correspondence imaging, recognition of early signs of stroke (Face Arm Speech test) by dispatchers and ambulance staff, UPU, doctors by family.
- Increasing the visibility of the cluster through the development and implementation of promotion activities and branding
- Promoting the cluster by participating in international scientific symposia and conferences;
- Participation in fairs, exhibitions and economic missions - dissemination of promotional materials for IMAGO-MOL and members;
- Lobby and advocacy in the field of policies aimed at the development of the medical imaging and related sector
- Health strategies for imaging evaluation (PET CT) and treatment control in cardiovascular diseases

➤ SIVI

SIVI's Vision is to position the health sector of Castilla y León as a reference at international level, consolidating itself as a forum for the international level, consolidating itself as a forum for the improvement of competitiveness that will contribute to improving health in Castilla y León, as well as in the international environment.

SIVI has worked along the following **lines**:

- To stimulate and promote the ICT and Healthcare sectors in the region of Castilla y León, encouraging training, research, development and innovation activities, and technology transfer, aiming to create a highly competitive sector, both nationally and internationally.
- To promote the interrelationship between technology-based companies and those of a healthcare nature, favouring the development of solutions in the field of disability, personal autonomy and situations of dependence.
- To promote growth and competitiveness in its field of action and that of its associates, supporting their development in all areas of its activity: market, solutions and technology, and professionals.
- To promote training and research activities in the field of technologies applied to assistance and health services.
- To achieve a strong business fabric that can compete in all types of markets.
- To establish the channels that make possible a better relationship with the institutions and organizations in charge of social policy both in the Community and in the State.
- To achieve the full internationalization of the sector.

From here, **SIVI must keep working in the following action lines**:

- Advice for the elaboration/presentation of projects to European national calls for proposals.
- Matchmaking actions: supply/demand, suppliers, etc. inside and outside SIVI Cluster.
- Support in the search for inter cluster/platform partners, etc.
- Representation in events
- Working groups
- Include new members of the value chain of the health sector, diversifying the cluster

Smart Specialization Strategy of Castilla y León, includes the Health and Quality of Life sector (or macro-activity) as one of the areas in which to advance in regional smart specialization, creating competitive and comparative advantages.

The macro-activities that make up the Pattern of Economic Specialization of Castilla y León.

Pattern of economic specialization of Castilla y Leon						
Macro-activity	Evaluation of the components of the pattern of economic specialization in Cyl					
	Econ. Coef. (2011)	Exp. Coef. (2011)	Econ. Weight. (2011)	Econ. Coef. (2015)	Exp. Coef. (2015)	Econ. Weight. (2015)
Agribusiness	1.89	0.75	7.8%	1.91	0.72	7.3%
Automotive, components and equipment	0.85	1.48	5.5%	0.86	1.54	6.3%
Health and Quality of Life	0.84	1.95	4.4%	0.83	1.71	4.4%
Tourism,	1.18	0.18	10.7%	1.17	0.18	11.8%
Energy and industrial environment	1.29	1.05	3.6%	1.25	1.14	3%
Habitat	1.16	0.79	10.8%	1.19	0.71	8.4%

Among the strategic objectives of the RIS3 is the "Application of knowledge and technology in health and social care, demographic change and welfare, to improve the quality of life of the population". And, among the areas to focus, the following are indicated:

Areas of action	
Biomedical Research	Epidemiological research: Sentinel Health Network, influenza surveillance, risk factors and evaluation of preventive and care programs, resistance microbial resistance
	Basic research: genomics, proteomics, transcriptomics, molecular and immune response diagnostics, molecular immune response, markers diagnostics and prognostic markers.
	New processes and/or pharmaceutical products
	Research at new diagnostic solutions: personalized medicine, clinical trials, cell therapy and regenerative medicine
Advanced Materials	Biomaterials and nanomaterials

It also includes **7 initiatives**: Circular Bioeconomy, Knowledge and Competitiveness, Socio-health Innovation, Cybersecurity, Industry 4.0, Stairways of Excellence and Connected Schools.

In regards to the "Health and social innovation" initiative, it is considered that innovation in health and wellness may be one of the keys to meeting the challenges.

The aim is to encourage participation and align the innovative activity of leading research institutions, companies and healthcare professionals in Castilla y León with these challenges, and it is here where the role of the Castilla y León SIVI takes on special relevance, and as part of the participating entities of the initiative.

It is worth mentioning that most of the companies that make up the sector are small and medium-sized companies (SMEs), therefore, collaboration among members that make up the value chain is fundamental.

In addition to the size of the companies, there are other factors that largely condition the development of the health sector in Castilla y León:

- The geographical extent of Castilla y León, with 18.66% of the total Spanish territory
- Population dispersion
- Population aging

Nevertheless, business dynamism has begun to increase in several ways: the location of some large pharmaceutical companies in these poles, the maintenance of family companies linked to the health sector, as well as the development of new companies with an important scientific and technological base.

Then, following the strategy of Castilla y León, SIVI seeks to drive the ecosystem along strategic lines, such as:

- Castilla y León building the future with R&D&I, contributes to generating in companies new knowledge and innovations and bring them to the market, as well as to increase the presence of Castilla y León in Europe.
- Castilla y León emprende, whose objective is to promote the creation of companies and the collaboration between the agents of the innovation and entrepreneurship ecosystem.
- Castilla y León with digital transformation, aims to promote the digital transformation of Castilla y León, as well as the consolidation of an offer of high quality and high value digital products and services.
- Sustainable Castilla y León, which seeks to help companies to position themselves to meet the challenges posed by the Sustainable Development Goals (SDGs).

➤ **MEDVIA**

MEDVIA was founded in September 2021 as the 7th spearhead cluster in Flanders. A “spearhead cluster” is a private public funded cluster initiative with the ambition to develop and implement a long-term strategy and competitiveness programme for a domain, which is considered strategic in Flanders.

MEDVIA is focusing on HealthTech which is considered and confirmed by different studies as an opportunity for Flanders. By investing in a spearhead cluster, the Flemish government makes a strategic choice to support the further development of an emerging sector with a high potential to impact society and create economic value.

The creation of the spearhead cluster MEDVIA fully complies with the RIS3 strategy of Flanders. This is further explained on the website of the Flemish government: <https://www.ewi-vlaanderen.be/onze-opdracht/ondernemende-economie/slimme-specialisatie>

The mission of MEDVIA is to build a leading healthcare innovation ecosystem in Europe. A strong network in collaboration with companies, knowledge centers and the government (triple helix) will therefore be created. Despite its main focus on supporting innovation in the industry, the end user should not be forgotten. Therefore, MEDVIA is also committed to connect the industry with the end users including care organizations and patients. Flanders is a small home market for the HealthTech industry. A HealthTech ecosystem in Flanders can only become strong if it is also outward looking. Internationalization will therefore also be one of the objectives of MEDVIA.

The Flemish government has allocated a yearly budget to financially support innovation projects, which are funneled through a selection process organized by MEDVIA. For this,

MEDVIA launches every year one or two calls on which project consortia can submit project proposals. Companies applying for these calls have to be member of MEDVIA or need to pay a success fee. The main objective of the allocation of earmarked funding to support innovation projects is of course to increase the investment and employment in Flanders.

The topics covered by the innovation projects, which can apply for this funding, have to comply with the four overarching themes of the spearhead cluster. Four general themes crystallized from consultation with the ecosystem, for which specific healthtech roadmaps will be co-created with the member companies and relevant healthcare stakeholders:

1. *Personalised medicine:*
HealthTech innovations focusing on smaller patient groups, down to a single patient.
2. *Digital medicine:*
HealthTech innovations with a significant digital component
3. *Disruptive health solutions:*
HealthTech innovations that shift the boundaries of medicine
4. *Value based efficient healthcare:*
HealthTech innovations that specifically increase efficiency in the healthcare system.

Some economical figures on the health tech ecosystem in Flanders:

The **life sciences** health ecosystem consists of both very large, mature and stable biopharma companies, and smaller, younger, but overall growing biotech companies. The reports by Pharma.be¹ focus on the traditional pharma and the biotech/pharma companies. The biotech-device companies are not taken into account. The recently published report on 2021 indicates that the sector counted in 2021 over 42,000 jobs for Belgium. This is a growth of 14,9% since 2017. The sector is investing over € 5.2 Billion in R&D, which is an increase of 35.1% from 2017. The export is about € 84,6 billion with a trade surplus of € 23 billion. 90% of the companies are SMEs.

The **MedTech** ecosystem consists of a small number of highly innovative but small companies complemented with a larger number of distribution centres and sales related activities. Medical technology or medical devices are all products and equipment that fall within the scope of the European Regulations 2017/745/EU ("MDR") and 2017/746/EU ("IVDR"). The list of the companies in MedTech comprises the biotech device companies but is disjunct with respect to the life sciences company list. According to the recently published 2022 report from beMedtech, about 17,000 FTEs are working in the sector of medical technology in Belgium. The export is about € 10 billion with a trade surplus of about € 1 billion.

The **electronics/ICT** ecosystem is a broad ecosystem, which is not fully active in the healthcare solutions space. We expect that a major part of the health related electronics/ICT activities are covered by the Medtech figures. However, the health ICT is certainly not. According to Agoria Health (Agoria is the Belgian federation of technology industry), the health-ICT niche sector employed 2252 FTE in 2019 with an annual growth rate of 5%.

➤ HBIO

Greece is a young and vibrant ecosystem. The Greek Biotech and Pharma Industry is considered a strategic national contributor for the economy, as the industry's GVA approximates € 1.4 b for 2020, growing at a CAGR of 16%. At the same time, according to Elevate Greece, the national start-up registry, approx. 14% of all startups in Greece are within the biosciences sector, representing the largest and fastest – growing sector.

Established players are increasingly pursuing international R&D collaborations for the development of competitive technology-based products. Significant research discoveries have been made by local researchers and there are several start-up and spin-off companies emerging that are in the process of commercializing their innovations. At the same time, commercial companies witness growing turnovers and start investing in spin-offs and start-ups.

Greece is an emerging Life Sciences and Biotech hub in Europe for several reasons:

- Global excellence in areas such as generics, delivery technologies and drug repositioning
- Emerging Clinical Trials location with strong government support
- Access to EU regulatory authorities
- Entry point to EU market
- A highly skilled labor force

Finally, it is important to note that Greek startups (all sectors) drew record investments in 2021 raising over €500 million in funding, more than 3x the capital attracted in 2020.

The Hellenic Biocluster (HBio) is the first and largest Health & Life Sciences cluster in Greece. HBio is a strong innovation moderator, connecting and supporting industry and academia partners to develop innovative and impact science. Established in 2006, HBio has grown to over 85 innovation-intensive companies with an international outlook.

According to the Smart Specialisation Strategy RIS3 2014-2020 developed for both regional and national levels in Greece, one of the most critical sectors for R&D development and thus, further funding and investment, is the sector of Life Sciences & Health. The challenges identified of **stimulating innovation in an improved framework, the strengthening of specialization and the improvement of implementation** as described in the policy, can all be faced effectively by the vision, strategy and actions of HBio.

HBio has a clear roadmap and strategy-defining processes, which enables it to add value to the partners, be sustainable and influence innovation trends not only in Greece, but also within EU. By creating and fostering dynamic synergies, HBio actively contributes to partner and sector growth and ensures a coherent and positive innovation climate for the bio industry in Greece. HBio delivers connectivity to the global science and technology frontiers, with the vision to continue being a catalyst, adding value to the innovation performance of our partners and Greece as a whole. It is important to note that HBio is a frequent interlocutor of the Hellenic government on matters of policy design in the areas of innovation support and life sciences strategy. HBio acts target-oriented, supports the development of competencies, the transfer of



knowledge, the generation of innovations, and align ecosystem activities to the requirements of a knowledge society and the continuing globalization.

HBio's vision is to:

1. be a catalyst for market-creating innovation, adding value to the innovation performance of our partners and Greece as a whole
2. add value to the health innovation ecosystem by the development of partner competencies and increased transfer of knowledge, and
3. contribute to the delivery of real solutions to the community and thus, creating a better society for all.

HBio's strategy directs how the vision will be achieved – a vision in alignment with the RIS3 national strategy- and is guided by 3 main strategic pillars:

1. collaborative networks - collaborating to integrate generated knowledge thus, creating a stronger, innovation ecosystem and enhancing Greece's innovation performance
2. science excellence - fostering breakthrough technology and knowledge and supporting sector growth
3. global engagement - deliver connectivity to the global science, technology and innovation frontier as well as accessing new markets for Greek innovation.

Some of the actions supporting HBio's strategy are:

- Build collaborative opportunities between academia and industry through linkage projects, grants and similar actions
- Connect and build digital awareness, mindset and capability to share results and receive input
- Foster the development of commercialization pathways (i.e. joint ventures, spin offs, licensing and research for equity)
- Develop strategic partnerships with Departments of Trade, attend fairs and organize business missions
- Showcasing Greek capability on the global map
- Provide a platform for Greek SMEs to access global markets and a platform for international companies looking to access Greek innovation
- Develop and implement initiatives to attract investment from global corporate ventures and venture capital firms
- Career development mentoring and support programmes
- Mobility programmes between industry and academia
- Enhance workforce flexibility by adding new skillsets to workforce
- Increase industry participation in public science initiatives
- Foster diversity and inclusion

2. Characterization of the Medic Nest Value Chain

➤ IMAGO MOL

IMAGO-MOL Cluster has 59 members who are concentrated in the North-East region, but also in the Bucharest-Ilfov, West and North-West regions.

From an institutional point of view, the cluster includes 4 universities from Iași, 2 research and development institutes, 2 facilitators: the North-East Regional Development Agency which established a Regional Contact Point of the IMAGO-MOL Cluster and the Iași Scientific and Technological Park, 2 representatives of local public authorities: Iași County Council and Iași City Hall, 6 non-governmental associations, 7 public/private hospital units from Iași and Suceava, 1 large company and 35 SMEs and startups in the field of medical and IT services from almost all counties of the region, but also from the Bucharest-Ilfov, West and North-West regions.

From a strategical point of view, some of the following entities are actively contributing to focusing the cluster activities towards precision medicine:

Entity	Short description
Universities	
The "Grigore T. Popa" University of Medicine and Pharmacy in Iași	It is a public institution of state higher medical education, with legal personality, non-profit, public interest, apolitical. The university has the following objectives: - the training of highly trained specialists - optimization of fundamental and applied scientific research activities, for raising the quality level, increasing competitiveness and affirming the performances of the Iași medical school and for the continuous improvement of medical assistance; - promotion of international cooperation relations, integration into the European medical education system
"Alexandru Ioan Cuza" University in Iasi	It is the oldest higher education institution in Romania continuing, since 1860, a tradition of excellence and innovation in education and research. With over 24,000 students and over 700 teaching staff, the university enjoys an important national and international prestige, having collaborations with over 500 universities from abroad
"Gheorghe Asachi" Technical University from Iasi	It s an advanced research and education university. Its mission is to carry out specific activities for the creation, innovative valorization of knowledge and its transfer to society in the fundamental fields - Engineering Sciences, Architecture and Urbanism -, as well as in interdisciplinary and complementary fields, in the local community, at the regional, national and national levels. international.
The University of Life Sciences "Ion Ionescu de la Brad"	It is an institution specialized in agronomic and veterinary medical higher education, with scope at national and European level, having as its fundamental mission the

	<p>training of engineers specialized in agronomy, horticulture, agricultural biotechnologies, engineering and management in agriculture and rural development, food engineering, environmental engineering, animal husbandry, bachelors in biology and veterinary doctors.</p>
<p>Medical establishment</p>	
<p>Emergency County Hospital "St. Spiridon"</p>	<p>It is the largest hospital in Moldova, over 250 years old, which is both a medical care, education and research facility. The hospital has the following structure: 20 clinical wards, the emergency reception unit, the Specialty Outpatient Clinic, the Pediatric Dentistry Outpatient Clinic, the Adult Dentistry Outpatient Clinic.</p>
<p>The Iași Regional Oncology Institute</p>	<p>A 300-bed health facility, was established by Government and has been in effect since 2012. The spaces of this unit are part of the functional requirements of a healthcare unit with an oncology profile, according to the legal regulations in force, so as to offer the population of all counties of Moldova what is necessary: efficiency, increasing the quality of the medical act, increasing accessibility to complete services and achieving an integrated, multidisciplinary medical system of specialties for all neoplastic locations.</p>
<p>"Prof. Dr. Nicolae Oblu" Iasi Clinical Emergency Hospital</p>	<p>It is a public health unit whose fame, due to a history of over 30 years, is confirmed and enriched by current performances. The hospital provides the entire range of services belonging to the specialties: neurosurgery, neurology and ophthalmology, in the ambulatory system, day and inpatient admissions - for all categories of specific morbidities.</p>
<p>The Suceava County Hospital</p>	<p>Is the most representative health unit in the county and unique in the municipality of Suceava with a hotel capacity of 1279 beds, which represents 35% of the total beds in the county, providing specialized medical assistance in 23 wards with different medical profiles for a population around 250,000 inhabitants and over 30% of the county's territory. The hospital medical services that health consumers benefit from are provided in 23 wards and 6 compartments, some of which have a unique medical profile in the county, namely the specialties: gastroenterology, urology, ophthalmology, medical oncology, etc.</p>
<p>The Clinical Hospital of Pneumophthisiology</p>	<p>It is the most important territorial center for diagnosis, monitoring and treatment of patients with respiratory diseases. Currently, the Hospital operates with three sections in the main building: Pneumology Section I, Thoracic Surgery section, ATI, Day Diagnostic Center - Pașcanu section II,</p>

	Tudor Vladimirescu Section III with the Pediatrics section, Section IV of Dr. Clunet and the TB dispensary.
"Elena Doamna" Hospital	It is a university clinical hospital specializing in Obstetrics and Gynaecology that serves the entire population of Moldova. The hospital offers continuous inpatient and day medical services, as well as specialist consultations through outpatient offices
Metropolitan Of Moldova And Bucovina, Archishop Of Iași, Providenta – Hospital And Polyclinic	The polyclinic was inaugurated under the name "Diagnosis and Treatment Center", in October 2000, in the presence of P.F. Teoctist Patriarch of Romania, H.S. Bartholomew I of Constantinople, I.P.S. Daniel of Moldavia and Bucovina and other Romanian hierarchs. In 2008, Providenta Hospital opened its doors, the first within the Church, with a structure approved by the Ministry of Health
Research Centers	
The Institute of Macromolecular Chemistry "Petru Poni" Iași	It is an institute of excellence of the Romanian Academy. Founded in February 1949, the institute has a tradition of over fifty years in fundamental and applied research, in the field of organic and inorganic chemistry, chemistry and physics of polymers.
The Romanian Academy, Iași Branch	It is a public institution with legal personality under public law and represents the form of territorial organization of the activity of the Romanian Academy
SMEs	
RomSoft	It is a company founded in 2011, which started its activity by developing software for haematology medical clinics. Its main services are: <ul style="list-style-type: none"> • Customized software applications & testing Services tailored to project complexity, collaboration model or application. <ul style="list-style-type: none"> • Research & development projects • Co-sourcing & Out-tasking • Consulting services dedicated to software start-ups as well as developed companies that want to develop their processes.
Scanexpert SRL	It is a medical company specialized in high-performance medical imaging - computer tomography and nuclear magnetic resonance. The company started its activity in 2009, by opening the first computer tomography (CT) imaging center in the ambulatory of the Romanian Municipal Hospital
Optim Diagnostic SRL	It owns an MRI machine in the Mavromati Botoșani County Hospital and specializes in performing high-performance Magnetic Resonance (MRI) imaging investigations, having contractual relations with the County Hospital. Botoșani Emergency Department, with CAS Botoșani, CASA OPSNAJ, as well as with other hospital units in the county.

EUROCLINIC ONCOLOGY CENTER (VICTORIA HOSPITAL)	It has a hospital structure, consisting of consulting rooms, outpatient treatment room, day hospitalization, continuous hospitalization, closed circuit pharmacy.
MEDimagis radiodiagnostic center	It offers the following services: 2D digital radiographs, CBCT, ultrasound
Strongbytes.ai	It is a digital product development and software development services company, with a focus on data and artificial intelligence / machine learning, in various industries (medical, financial, security, automotive and others)
Rayscape	It is a medtech startup founded in 2018 in Timisoara that developed an application for the analysis of lung radiographs using artificial intelligence algorithms, thus developing a platform that helps radiologists in this process. The app is currently being used by hospitals across the country.
Sentic Lab	It is an applied research company based in Iasi (Romania). Thanks to a talented team of computer scientists, engineers and scientific consultants from the academic world, it develops innovative medical diagnostic software. It collaborates with the Alexandru Ioan Cuza University in Iasi, which promotes excellence and innovation in the fields of education and research
Duk-Tech	It is a company with 100% Romanian capital, specialized in providing software development services. Throughout the more than 12 years of experience, the company has collaborated and continues to collaborate with partners from Romania and abroad (Holland, England, France, Belgium, USA), being involved in the development of eCommerce projects, ERP applications, web portals information, online reservation systems, online casino, applications including GIS systems, social networks, NLP integration, survey and evaluation systems
Synaptic Technologies SRL	It is a start-up from Cluj Napoca that proposes solutions based on artificial intelligence to improve the quality of medical services. Services offered: Custom database analysis
The Lux-Ro diagnostic center	At the Lux-Ro Diagnostic Center you can benefit from consultations in medical specialties such as: pediatrics, cardiology, gynecology, surgery, internal medicine, gastroenterology, psychology, psychiatry, neurology, neurosurgery, ENT, urology, nephrology, physiotherapy, dermatology -venereal, endocrinology, nutritional diseases and ophthalmology, etc.
Skyer Medical Imaging	It is a provider of IT systems for radiology and medical imaging (PACS, RIS, teleradiology, patient portal), with 15 years of experience in the field and a portfolio of over 50 installations in Romania and the Republic of Moldova. Developed with state-of-the-art web technologies, our solutions fully integrate the workflow of an imaging center: patient scheduling and registration, long-term

	image archiving, advanced visualization for diagnosis, automated patient CD/DVD burning, image printing paper, writing results and distributing them online together with DICOM images to medical specialists and patients
Oncochain	Oncochain is a Romanian start-up that builds an ecosystem to collect, structure and analyse real-world data in oncology. Their goal is to empower cancer centers, clinicians and life sciences companies with deep actionable insights in order to accelerate research and optimize treatment. They innovate through technology so cancer will have no impact on patients' lives.
Philips Romania	Philips, a leader in medical technology, focuses on improving people's health and ensuring better results across the entire health continuum - from healthy life and prevention to diagnosis, treatment and home care.
Non-governmental organization	
The Coalition of Organizations of Patients with Chronic Diseases from Romania	Organization that aims to promote and protect the rights of patients with chronic diseases. COPAC's mission is to support patients and patient organizations to act unitedly and effectively to defend and promote patients' rights
The Center for Innovation In Medicine	The Center for Innovation in Medicine is an organisation based in Bucharest, Romania, focused on the innovation in healthcare. The Center for Innovation in Medicine serves as an independent platform for informed dialogue between all stakeholders in the field of omics medicine, personalised (precision) medicine, digital health, data oncology, immune-oncology, cancer research, biotechnology, systems biology and other hot scientific topics.

➤ **SIVI**

The scientific and technological standard is designed on the basis of scientific publications, patents and R+D+I project in the area of Health. The areas of Biochemistry, Genetics, Cancer Research, Cell Biology, Haematology, Oncology and Immunology stand out.

The innovative and technological base is summarised in the following table:

Entity	Short description
Public universities	
Burgos University (UBU)	The UBU has the following Health Sciences Research Units: UIC-Food Technology and UIC-Microbiology. As well as with several research groups in the fields of: - Biochemistry and Biotechnology - Quality of Life in Diversity and Occupational Therapy - Microbiology - Nutrition and Dietetics

	<ul style="list-style-type: none"> - Pathophysiology of Diabetes, Obesity and their Therapeutic Education - Food Technology - Data Analysis Techniques Applied in Health Environment <p>The OTRI-OTC of the University of Burgos is the structure that acts as a link between the scientific and the business world.</p>
Leon University (ULE)	The ULE carries out research activities in most of the scientific and technological fields indicated in the regional specialization pattern. with research activities in the fields of Life Sciences (Biology, Biotechnology, Environmental Sciences) and Bio sanitary (Biomedicine, Medicine, Veterinary Sciences).
Salamanca University	It is characterized by its high-level research centres in the field of health and quality of life, some of them in collaboration with the CSIC, such as the Cancer Research Center (CIC), the Institute of Neurosciences of Castilla y León and the Institute of Microbiology and Biochemistry. In recent years, through the Galileo Program, has promoted the creation of spin-offs in the field of healthcare.
General Foundation of the University of Valladolid	Its fundamental mission is to cooperate with the fulfilment of the aims of the University of Valladolid. The University has nationally and internationally recognized research groups in: metabolic diseases and neurodegeneration, pharmacogenetics, cancer genetics, genetic polymorphisms and pharmacopathology; clinical, diagnostic and epidemiological virology; Antitumor immunotoxins, etc.
Private university	
European University Miguel of Cervantes	One of the objectives of this University is to promote scientific, technical and artistic research, as well as the effective management of knowledge and technology transfer. Among the Research Groups linked to the field of Health, we can mention: Physical and Sensory Disability, the i+Health research group in Oral Health, and Odontological Treatment of Apnea-Hypopnea Syndrome.
Research centres	
IBIOMED, Biomedicine centre	IBIOMED is an Institute of the University of León dedicated to research in the resolution of human health problems, physiology and development. It also includes research in public health, where epidemiology, sociology and other related disciplines have their application.

	<p>Among its research areas are:</p> <ul style="list-style-type: none"> - Animal and cellular models in biomedicine. - Molecular and cellular mechanisms implicated in the therapeutics - Physical activity, epidemiology and health
<p>IBSAL, Institute of Biomedical Research Salamanca</p>	<p>It was established in 2011 with the collaboration of the Ministry of Health of the Castilla y León, the Spanish National Research Council (CSIC) and the University of Salamanca. It promotes translational biomedical research and the synergy between basic, clinical, epidemiological and health services of the University and Primary Care Management.</p> <p>Among its lines of research are:</p> <ul style="list-style-type: none"> - Cancer - Cardiovascular - Neurosciences - Infectious, inflammatory, metabolic and degenerative diseases. - Gene and molecular therapy - Primary care, public health and pharmacology
<p>CIC, Cancer Research Centre</p>	<p>The objectives of the CIC are, among others:</p> <ul style="list-style-type: none"> - To conduct cutting-edge cancer research at the basic, applied and clinical research. - To favour the bidirectional transfer of information between basic and applied biomedical science, to promote synergy between the 3 types of research and improve their productivity. - To become a scientific centre of excellence capable of competing on equal terms with other international centres. - To promote the creation of wealth and services that will have an impact on social welfare and economic development at regional and national level.
<p>Foundation of the Institute of Health Sciences of Castilla y León (IESCYL)</p>	<p>The purpose of this non-profit foundation is to promote training, research and dissemination in the field of Public Health, Health and Social and Health Care Management, Health Law and Occupational Health.</p> <p>In order to achieve its objectives, in collaboration with public and private entities, the Foundation carries out the following actions:</p> <ul style="list-style-type: none"> - To develop research and training activities in public health and health care. - To elaborate and develop training programs for health professionals, as well as other technicians. - To organize courses, seminars and events of a similar nature related its foundational purpose. <p>Likewise, the IESCYL assumes the direct management of strategic projects of the Regional Ministry of Health, being, therefore, a backbone of the biomedical research in the Public Health System of Castilla y León.</p>

<p>FBIS, Burgos Foundation for Health Research</p>	<p>The objective of this private Foundation is the promotion of scientific research in the field of health, as well as the development, dissemination, diffusion, divulgation and support to all kinds of subjects, works and studies in this field. One of its main tasks is the concession of grants for studies and research.</p>
<p>Technological centres</p>	
<p>INBIOTEC, Biotechnology Institute of Leon</p>	<p>Regional technology center specializing in various areas of Biotechnology application: in the area of Biopharmaceutics and Biomedicine, Agrifood, Energy and Environment, Industrial Processes and Bioinformatics.</p> <p>Its main area of activity is biotechnological development related to the transformation of raw materials of plant origin into high added value products, for the pharmaceutical industry to obtain antibiotics, antitumor antibiotics, antitumor agents, proteins, vitamins, growth factors, etc.</p> <p>Its services are the following:</p> <ul style="list-style-type: none"> -Isolation of microorganisms for medical and pharmaceutical applications. -Genetic improvement and alteration of microorganisms of industrial interest. -Large-scale cultivation of microorganisms. -Secretion of proteins and growth factors -Extraction and purification at laboratory level of the products formed. <p>Among its main technologies we can mention: microbial biotechnology, omics technologies, in vitro/in vivo models, analytical chemistry and toxicology.</p>
<p>ITCL, Technology Centre of Castilla y Leon</p>	<p>Private, non-profit technology centre, founded in 1989 with a multisectoral approach.</p> <p>The ITCL offers advanced technological services and cooperates with companies in the design and execution of applied research, technological development and innovation projects that are technically and economically viable.</p> <p>In addition to projects, the ITCL offers services of technical feasibility studies and specialized technical training.</p>
<p>CARTIF Foundation</p>	<p>CARTIF is a private, non-profit, horizontal technology centre.</p> <p>Its interdisciplinary teams work in five areas of knowledge corresponding to different economic and technological sectors: industry, energy and environment, construction and infrastructures, agri-food infrastructure, and health and quality of life.</p> <p>In this area of Health and Quality of Life, CARTIF offers solutions and technologies to aid research, diagnosis and treatment of diseases and the improvement of the technological systems used in different areas of Health.</p>

	Thus, CARTIF has solutions for hospital logistics and traceability, interoperability of health information systems, robotic neurorehabilitation, signal analysis, assistive technologies, cognition, functional feeding or biomechanical systems and surgical instruments.
Hospitals	
Rio Hortega -Valladolid Hospital	Its main objective to link the health care activity and the need for research, generating new knowledge that will lead in better medical assistance and patient care.
University Clinical Hospital - Valladolid	The main objective is to promote and support the development of translational research and comprehensively cover the needs of the center's researchers. To this end, the Unit is structured into four sections: <ul style="list-style-type: none"> - Research Management - Methodology and Statistics - Clinical Research Laboratory - Nursing Research Support
Complejo Asistencial Universitario of León, CAULE	Health Complex composed of 3 hospitals (Hospital of León, Hospital Monte San Isidro and Hospital Santa Isabel) and the San Antonio Abad building. It has a Joint Research Unit with three laboratories, Cellular Biology, Molecular Biology and Microsurgery facilities and infrastructure available to all CAULE researchers.
Foundation General Hospital Santísima Trinidad	Institution dedicated to the provision of health and social-health services, to meet the needs of patients and the care and assistance to the elderly through the provision of specialized health services, both on an outpatient and in-patient basis, contributing to the maintenance and improvement of the population's health.
SMEs	
Glaxo SmithKline	GSK has 6 key research areas: Respiratory, HIV and Infectious Diseases, Immuno-inflammation, Oncology, Rare Diseases and Vaccines. And it has now developed a new line of consumer healthcare products. GSK also conducts research in bioelectronics: a new class of drugs consisting of implantable devices in miniaturized devices. The company collaborates in research linked to: <ul style="list-style-type: none"> -drug discovery -biotechnology -Neglected tropical diseases -Identification of problems for patient safety. -Rare diseases. GSK has also created the Diseases of the Developing World (DDW), pioneering research center in Spain and one of the few in the world for the treatment of malaria and tuberculosis. GSK holds more than 10,000 patents worldwide.

<p>MABXIENCE</p>	<p>is an international biotechnology company, specialized in research, development and manufacturing of monoclonal antibodies.</p> <p>With 6 patents worldwide, it has completed two clinical trials for its products (rituximab and bevacizumab), with a total of 17 countries and 75 research centers involved.</p> <p>These trials were conducted in patients with non-Hodgkin's lymphoma (rituximab) and metastatic colorectal cancer (bevacizumab). It currently has 3 products in the R&D phase.</p>
<p>BIOMAR MICROBIAL TECHNOLOGIES</p>	<p>Company specialized in Microbial Biotechnology and Chemistry of Natural Products, emerged as a spin off of PharmaMar (Zeltia Group).</p> <p>With 25 patents worldwide, it is currently developing 5 R&D projects with public funding (ERDF, ESF, ICE-Castilla y León, MINECO).</p> <p>The company is developing R&D&I projects in Agriculture (biostimulants, bactericides, biopesticides, etc.), Food and Nutraceuticals, Cosmetics and Human Health (compounds in preclinical phase) and provides high added value services:</p> <ul style="list-style-type: none"> taxonomic identification of microorganisms Identification of active compounds Production from bacteria, fungi and actinomycetes Screening for research in antitumor areas, antioxidants, antibacterials, antifungals.
<p>LSNE</p>	<p>GADEA Grupo Farmacéutico started its activities in 1991 and is composed of the companies Crystal Pharma (development of complex molecules, APIs complex molecules, APIs, steroids, sex hormones, production of intermediates and APIs through biotechnological processes, etc.) and Gadea Biopharma (lyophilization and sterile packaging with high quality standards). In 2015, Gadea Grupo Farmacéutico became part of AMRI, a global research and development company.</p>
<p>Antibióticos de León</p>	<p>This company from León is currently owned by ADL Binatur Solutions, a multinational company listed on the Alternative Stock Market.</p> <p>Antibióticos de León has 60 years of experience in the biopharmaceutical industry and has two main areas of activity:</p> <ul style="list-style-type: none"> - Development and manufacture of therapeutic active substances (mainly beta-lactam active ingredients). - Development and contract manufacturing for third parties of intermediate products based on fermentation processes, for the food, cosmetics and biotechnology industries.
<p>Inmunostep</p>	<p>The company was created in 2000 from the Cancer Research Center (CIC). It is a biotechnology company that develops, produces and markets diagnostic and research reagents and devices for use in cytometry.</p> <p>In addition, the company has developed a series of technological platforms that give it a competitive</p>

	<p>advantage in the development of antibodies for diagnostic purposes.</p> <p>The company has an important program for the development of new products through technology licensing, collaborations and internal development. Immunostep has the SME INNOVATOR seal and 2 international patents.</p>
León Research	<p>Leon Research offers outsourcing services worldwide. It has extensive experience in clinical research with Phase I to Phase IV clinical trials, medical device studies, observational and food studies. Its solutions include all design, start-up and monitoring activities for clinical trials and research studies.</p> <p>They manage the entire process of bringing new medical devices or drugs to the market, from medical writing to data management and registration.</p>
Innovagenomics	<p>It develops new tools for genetic diagnosis in 2 divisions: Human Analysis (genetic diagnosis of hereditary diseases, identification of tumor markers with diagnostic and prognostic value and collaboration with the SNS to facilitate access to these techniques) and Agri-Food Analysis (genetic disease diagnosis, identification of breeds and filiation, agri-food analysis, product traceability, etc.). It is recognized nationally and internationally recognized as a diagnostic laboratory.</p>
Cytognos	<p>It is a clinical diagnostics company dedicated to the design and development of reagents, software and techniques that provide innovative solutions in the field of flow cytometry. In 2017, the company put on the market an automatic analysis tool for hematology laboratory, marking the first time that a product of these characteristics.</p> <p>With a multitude of R&D&I projects at regional, national and European level, the company is recognized as an INNOVATIVE SME and has 2 international patents.</p>
AMADIX, Advanced Marker Discovery	<p>Founded in 2010, it is a leading molecular diagnostics company that develops and commercializes markets innovative tests for the diagnosis of cancer.</p> <p>AMADIX's scientific team works closely with research groups in more than 20 research groups in over 20 countries to identify diagnostic biomarkers with high potential for implementation in clinical practice.</p> <p>It is funded by H2020 as well as the support of several of Spain's strongest venture capital funds.</p> <p>Winner of the South Summit 2018, it won in the Health category and in the last round as absolute winner of this edition. It has 3 international patents.</p>

➤ **MEDVIA**

MEDVIA has 101 members located in Flanders, Brussels and the Netherlands. The cluster includes a broad variety of start-ups, micro, small, medium and large companies, all Flemish universities, 5 research centers and 10 hospitals. All members are active in 1 or more of the following domains: MedTech, Biotech or Digital Tech.

Entity	Short description
Facilitators	
AGORIA	<p>Agoria's mission is improving quality of life. Agoria provides promotion, services and consultancy services in the fields of: Human Capital & Education, Digitisation, Society, Legislation & Finance, Manufacturing, Climate, environment & energy, Market development, Infrastructure</p> <p>Their purpose is to connect all those inspired by technology, to help companies grow and to help shape a sustainable future.</p>
VOKA	<p>Health Community is Voka's network for 600 knowledge centres, patient groups, care organizations and (care) companies all over Flanders and Brussels. Within the community, profit and non-profit organizations join forces to realize innovation in healthcare in Flanders. After all, only with state-of-the-art healthcare will Flanders as a society be ready for the challenges of tomorrow.</p>
ZORGNET ICURO	<p>Zorgnet-Icuro vzw is the umbrella organisation of the Flemish general hospitals, initiatives in mental healthcare and social profit facilities in geriatric care. More than 775 recognised care organisations are members of Zorgnet-Icuro, together employing almost 140,000 staff. These care facilities want to offer high-quality, affordable and accessible care.</p> <p>Zorgnet-Icuro is a network that plays an active role in exchanging knowledge, ideas and good practices in healthcare. It develops visions about how to organise healthcare and how to offer high-quality, accessible and affordable care to the population in a sustainable way in the future.</p>
Universities	
University of Ghent	<p>Ghent University is a top 100 university founded in 1817. As one of the major universities in Belgium, our 11 faculties offer a wide range of courses. Ghent University is an internationally renowned, open, pluralistic and socially engaged university, more than 200 years old, offering more than 200 programmes (including 64 English-taught master's programmes) The university conducts in-depth research within a wide range of scientific domains.</p> <p>University Ghent's credo is Dare to Think: they are a haven for courageous thinkers.</p>
Vrije Universiteit Brussel	<p>Vrije Universiteit Brussel is for more than 50 years committed to providing solutions to the challenges of tomorrow through</p>

	<p>high-quality research, customised education and a strong social drive. VUB is anchored in Brussels and Europe and works according to the principles of the Enlightenment: critical thinking, free enquiry, and humanism. At VUB, there is an extensive range of bachelor's, master's programmes, advanced master's programmes, postgraduate programmes and other courses to become and stay relevant as a professional in the job market of the future.</p>
University of Hasselt	<p>Hasselt University is structured as a matrix organisation, directing education, research and valorisation in an integrated manner. As civic university they commit to share knowledge in ways that benefit society. Strong public engagement was, is and always will be at the core. Students, staff, researchers and alumni are willing to make society smarter, more agile and better.</p>
University of Leuven	<p>KU Leuven is an international community where innovative research forms the basis of all academic programmes. Across the university, driven researchers and curious students continually gain new insights and use their knowledge to tackle the foremost challenges of our time. From Renaissance philosophy to cutting-edge nanotechnology: KU Leuven has promoted ground-breaking research and high-quality education throughout its storied existence. KU Leuven is dedicated to education and research in nearly all fields. Its fifteen faculties offer classes and degree-granting academic programmes, whilst research activities are organised by departments and research groups. These faculties and departments are clustered into three thematic groups: Humanities and Social Sciences, Science, Engineering and Technology (SET), and Biomedical Sciences. Each of these groups sponsors its own doctoral school for organising and awarding doctoral degrees. KU Leuven boasts thirteen campuses, spread across 10 cities in Flanders.</p>
University of Antwerp	<p>The University of Antwerp is a young, dynamic and forward-thinking university. It integrates the assets of its historical roots with its ambition to contribute positively to society. The University of Antwerp develops, provides access to and disseminates scientific knowledge through research, teaching and academic service to the community and accomplishes these tasks in a spirit of academic freedom and responsibility. The University of Antwerp espouses active pluralism. In that spirit, it stimulates critical research and teaching, reflection and debate on scientific, social, philosophical and ethical questions.</p>
Medical establishment	
AZ Groeninge	<p>AZ Groeninge is a supra-regional hospital in the Belgian city of Kortrijk. The hospital is the result of a merger of three Catholic hospitals and one OCMW hospital.</p>
UZ Leuven	<p>UZ Leuven is a university hospital where patients can count on specialised care and innovative treatments, combined with humane attention and respect for every person. Every</p>

	<p>day, more than 10,000 passionate employees provide the best possible custom-made care.</p> <p>Future care providers and employees receive high-quality training in UZ Leuven, with a view lifelong learning and innovation. As a pioneer in clinical research, the hospital also contributes to future patient care.</p>
AZ Delta	<p>AZ Delta is a highly specialized hospital with 1403 licensed beds. There are two campuses in Roeselare, one in Menen and one in Torhout. In 2020, the new campus in Rumberke opened. There is a strong differentiation within the hospital where all facets of specialized care are available, from cardiosurgery to renal dialysis and neonatology. Orthopedics is one of the hospital's spearheads. AZ Delta employs 4,000 people, including about 385 physicians.</p>
AZ Turnhout vzw	<p>AZ Turnhout is a regional hospital that grew out of originally Catholic hospitals. It consists of two campuses in Turnhout: the Sint-Elisabeth campus and the Sint-Jozef campus.</p>
AZ Ziekenhuis Geel vzw	<p>Hospital Geel is a regional hospital offering a range of services. The hospital has more than 300 beds and annually accounts for 136,000 consultations, 60,000 admissions (including day hospitalizations), 14,000 surgical procedures, 370,000 technical examinations, 3.7 million lab tests and 23,500 patients in emergency. The hospital also houses the well-known Rehabilitation Center Geel, one of the largest and best-equipped rehabilitation centers in the country.</p> <p>Hospital Geel wants to remain a leader in the Kempen region through good cooperation within the Hospital Network Kempen with H. Hartziekenhuis Mol, AZ Herentals and AZ Turnhout.</p>
AZ Herentals vzw	<p>The Saint Elisabeth hospice of Herentals dates back to 1253, making it the oldest hospice in the Kempen region. Beginning in the 20th century, the expansion of the hospital gained momentum. A new hospital, opened in 1938, the mother house Sancta Maria opened in 1950 (which merged with the hospital in 1984 and moved to the hospital with its services in 1997), and both in the 1970s and 1990s new buildings were inaugurated. After all those new construction projects, renovation of the existing buildings began in 2001. January 1, 2010 marked the start of a new period in the existence of AZ Herentals: the OCMW-hospital received a non-profit status and has been on its own since then. In 2011, AZ Herentals and AZ Turnhout entered into a partnership under the name "HETU," to offer specialized care with combined forces. In 2016, together with the hospitals of Mol and Geel, they joined the Kempen Hospital Network (ZNK).</p>
AZ St Jan Brugge ziekenhuis	<p>The AZ Sint-Jan Brugge-Oostende AV offers innovative reference care for everyone. This hospital's tradition is eight centuries old; Sint-Jan's first hospital ward was built around 1150. Today, it has 1,182 beds. We offer basic to highly specialized care on three different campuses: campuses Sint-</p>

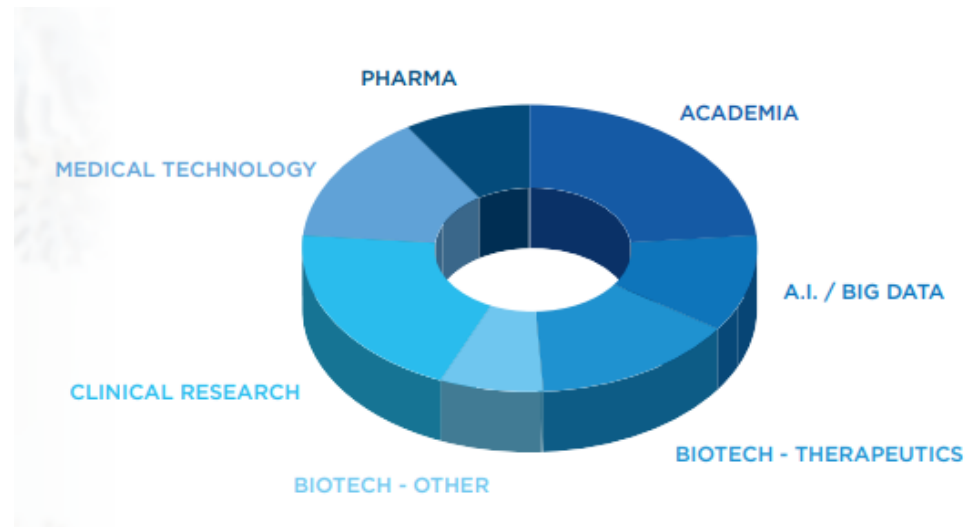
	Jan and Sint-Franciscus Xaverius in Bruges and campus Henri Serruys in Ostend.
VITAZ vzw	On Jan. 1, 2022, AZ Lokeren and AZ Nikolaas officially merged into one hospital. Vitaz has six campuses, spread throughout the Waasland region. A deliberate choice, whereby they offer the population of the Waasland region quality and strong basic care close to home.
AZ Maria Middelaes vzw	AZ Maria Middelaes is an innovative hospital in the green outskirts of Ghent. In its continuous pursuit of quality-assured expert care, friendliness and patient experience are central. The modern hospital has high-tech infrastructure and state-of-the-art medical equipment. The Maria Middelaes Medical Center in Gentbrugge is an outpatient clinic where almost all medical specialties are offered. There is also an artificial kidney department (low care) and a radiology department. The Medical Center in Aalter, a joined effort with AZ Sint-Vincentius Deinze, also offers a wide range of medical specialties.
AZ Glorieux vzw	At the az Glorieux, high quality care is paramount and the patient is central. The hospital offers an excellent location on the linguistic border of the Flemish Ardennes and Le Pays des Collines. The az Glorieux kidney dialysis has 3 external satellites, making it one of the largest players in Flanders. Various medical disciplines are offered in the Avelgem, Brakel and Lessines Medical Center.
Public administration	
VLAIO	Flanders Innovation & Entrepreneurship - VLAIO for short - is the point of contact of the Flemish Government for all entrepreneurs in Flanders. VLAIO stimulates and supports innovation and entrepreneurship and contributes to a positive business climate that strengthens sustainable economic growth and job creation. VLAIO's mission is to stimulate growth and innovation by financially supporting businesses with subsidies. VLAIO also promotes entrepreneurship by guiding SMEs from (pre)start through growth to acquisition. Moreover, VLAIO supports cluster operation, encouraging them to cooperate more intensively with other companies and knowledge institutions in a group-based setting, such as in clusters, innovative business networks and living labs.
Research centres	
VIB	VIB scientists conduct cutting-edge research in a range of disciplines ranging from cancer and inflammation to neuroscience and plant biology. One of the institute's strengths is the collective expertise of its scientists, who are among the world's best in their fields. VIB has a total of 12 core facilities. They provide support in numerous research areas and have specialized scientific equipment and services for

	each discipline. VIB Technologies continues to grow and consists today out of 100+ experts in Biotech to support your R&D with state-of-the art technologies.
imec	Interuniversity Microelectronics Centre (IMEC) is an international research & development organization, active in the fields of nanoelectronics and digital technologies, with headquarters in Belgium. Imec employs around 4,000 researchers from more than 90 countries; it has numerous facilities dedicated to research and development around the world, including 12,000 square meters of cleanroom capacity for semiconductor processing. The imec headquarters are located in Leuven. Imec is well-known for its expertise in shrinking circuitry and the applicability of nanotechnology in novel industries. Imec performs research in smart energy and AI.
SCK - CEN	SCK CEN is a research centre dealing with peaceful applications of nuclear energy performing forward-looking research and developing sustainable technologies for socially valuable purposes. With more than 750 employees, SCK·CEN is one of the largest research centres in Belgium. Focus is on three research topics: safety of nuclear installations; management of radioactive waste; human and environmental protection against ionising radiation. More specifically on research and innovation in the fields of advanced treatment of spent nuclear fuel and high level waste, medical radioisotopes, research and production, development of advanced materials and nuclear energy systems. Thanks to its availability of large and unique nuclear installations, SCK·CEN is recognized worldwide and shares its knowledge through numerous training courses in order to keep up an exceptional pool of talent.
VITO	VITO is an independent Flemish research organisation in the area of cleantech and sustainable development. VITO accelerates the transition to a sustainable world and de-risks innovation for businesses. They strengthen the economic and societal fabric of Flanders, with interdisciplinary research and large-scale pilot installations. VITO's mission is to accelerate the transition to a competitive, clean and secure energy system in Flanders and the world. Moreover they want to introduce short material cycles to set up ecosystems throughout the world for circular economy and radically reduce the consumption of fossil-based feedstocks and energy within the Flemish chemical sector. Last but not least, VITO wants to facilitate innovative, preventive and affordable healthcare, underpinned by measuring instruments and data in a sustainable way.
SIRRIIS	Sirris is a dynamic not-for-profit organization founded and governed by industry. Sirris is the trusted companion of all Belgian companies with an appetite for technological innovation. It is harbour to a multidisciplinary team of 150

	experts, more than 200 partners, ecosystems, a wide range of industrial labs and tons of inspiration.
Industry members	
Start-up, Micro, Small, Medium, Large Companies	MEDVIA industry members are categorized according to the size of the organization.
Members with / without voting rights	MEDVIA is organized in different service levels. Only the top level has voting rights in the organization. Like this they have an impact on the strategy, vision and mission of MEDVIA. This top level also has beneficial rates for some of the activities and events offered by MEDVIA.
Industry Members with voting rights	Ablynx/Sanofi, AIP, Antleron, Barco, Biocartis, Biolizard, Biostrand, Cochlear Technology Centre Belgium, Comate, Efika Sciences, Galapagos, Hippocreates, Imec, Janssen Pharmaceutica, Materialize, Medenvision, moveUP, P&X Medical NV, Protex Healthcare, Voxdale.
Non governmental organization	
MEDVIA's Care advisory council	MEDVIA created the Care advisory council in October 2022. The goal of the Care advisory council is to voice the needs of the end users of Health Tech innovation. It consists out of ca 20 representatives of hospitals, patient organisations, general practitioners, nurses, care at home organisations and elderly houses. Moreover, it is the goal of MEDVIA to bridge the industry with the care advisory council to ensure that solutions coming from the industry are customized to their needs so that adoption of innovation is realized.

➤ HBIO

HBio currently has more than 85 members, across the whole sector of Biotech & Life Sciences, with most developing products and services to be used for personalized and precision medicine. Cluster members range from spinoffs, to startups, SMEs, big Greek Pharma and international pharma, all innovating in Greece.



Cluster members are across the whole drug and healthtech development – from basic research to translational research, into real solutions for the community. HBio specialises in the following areas:

- **Drug Development** including new molecules, new targets and repurposing in the therapeutic areas of neurodegenerative diseases, protein misfolding diseases, oncology and rare diseases
- **Diagnostics** with a range of kits for metastatic breast cancer patients, thoracic and abdominal aortic aneurysms, pathogens and viruses and infectious diseases
- **Custom-made PoC Diagnostics** including biomarkers for sepsis and cardiovascular disease and ophthalmological devices
- **Personalized Care** developing patient-specific, anatomically-exact models for radiation therapy for brain tumor patients; innovative, non-invasive, continuous monitoring for Parkinson's disease, and personalized digital therapeutics empowering patients and healthcare
- **Medical Devices** including Innovative implants for cataract surgery, ambulatory Infusion Pumps for Pain Management and Analgesia, Parenteral Nutrition etc. and 2nd generation platform technology to replace systemic chemotherapy
- **Advanced Therapies** by the development and clinical production of ATMPs in the therapeutic areas of orthopedics, dermatology, nephrology
- **Manufacturing/ Big Pharma** mainly in added-value generics development & manufacturing
- **CROs/ Specialized Services** in a wide range such as organ-on-a chip (neurodegenerative diseases); Bioinformatics, Pharmacogenomics, Metagenomics; Biomarker Discovery, Assay Development; Pre-clinical imaging (desktop) & tumor 3D modelling; Commercialization of innovative and added value drugs; *in vivo* animal models and PK/PD studies (arthritis, psoriasis, cancer); Clinical Trials, Pharmacovigilance, Regulatory Pathways; IVD production sites; Biosafety and DNA-based traceability solutions; Telemedicine (chronic disease); Clinical Decision Support Systems

As mentioned previously, HBio is an active collaborator of the Centre of New Biotechnologies and Precision Medicine of the National & Kapodistrian University of Athens and the Greek Research Infrastructure for Personalised Medicine, supporting research and innovation towards next generation healthcare applications, as well as the Hellenic Network of Precision Medicine on Cancer and the newly established “Greek Institute of Human Genomics”. Hence, HBio is the ideal partner within the Greek ecosystem connecting both industry and academia in order to facilitate the further development and implementation of science based health care research for genomic and precision medicine in Greece and EU as a whole.

3. Cross Sector Opportunities and competitiveness and the precision medicine market where the group operates

The members of the consortium were carefully chosen based on their profile, programs and activities developed and their specific expertise. The partner regions have ecosystems combining biomedical, technological and data driven expertise. By bringing these ecosystems together, a higher added value will be reached and boost the implementation of Precision medicine. Moreover, the exchange between clusters positioned in regions with different profiles in terms of economic development, competitiveness and innovation will contribute to the amelioration of the SME competitiveness landscape and boost the innovation for the less performing ones.

The main Opportunities detected from the joint SWOT analysis of the cluster members are:

- Existing of European/national/local instruments to promote cooperation
- Existing National Policies to Fight Cancer and support the European plan
- To provide services to evaluate facilities, infrastructures and new business models
- Cross-regional collaboration
- Lobbying with EU for new frameworks legislations on Precision Medicine
- Representing the EU health sector on international level
- Facilitating partnership for European projects
- Take advantage of rapid Digital transformation in healthcare
- Aging & Chronic diseases
- Consolidate the Precision Medicine landscape
- Closeness of MEDVIA to Brussels
- Support internationalization in Europe
- Facilitation of cross-funded projects in the framework of S3P4 PM&VI
- Inform members and stakeholders on new/updated EU data regulations
- Develop cost-effective actions that were not feasible previously
- The repository from Sapphire project
- More EU funding for Precision Medicine to be available

And the main threats that shall be converted into opportunities during the development of the project are:

- Delayed patients' access to medical services and poor prevention programs implementation results in pathologies identified in advanced stages
- Limited access to international high risk investors
- Negative impact of economic crisis on Community businesses, both in terms of employment and general economic activity.
- Lack of sufficient public funding through coherent national programs for prevention and diagnostic using genetic testing.
- Increased global competitiveness
- New European laws and their transposition in each European country.
- The new MDR/IVDR is a long process reducing competitiveness compared to other countries.
- Risk of talent relocation to big cities, due to the global rise of teleworking.
- Biotechnological developments are not adopted by healthcare systems.
- Too low knowledge of the ecosystem within the ecosystem: people do not know the other actors in the domain
- No access to test sites for medical technologies to run pilot studies
- Risk of loss of competitiveness of smaller companies if they fail to progress in their digitalization, with adequate connectivity infrastructure

4. Addressing the upskilling and/or reskilling needs

The upskilling needs in a short-term perspective can be extracted from the weaknesses identified from all members of the clusters and the clusters themselves identified that are:

- Few high-risk investors or difficulty attracting them
- Insufficient state funding and high competitive EU funding, resulting in less financing for industry
- Limited commercialization and scale up funding, and complicated co-funding
- Long timelines for product development of biotech sector
- High costs of genetic testing
- Variable ecosystem size resulting in fragmentation
- Insufficient top healthcare system and infrastructures and degree of digitalization between regions
- Lack of interoperability of the medical data
- Training activities and innovation by scattered initiatives
- Limited number of genomic banks, blood banks, clinical trials and national cancer registries.
- Reduced synergies and complementarities between existing capacities and infrastructures, between university - business, or between private-public sectors
- Industry and academia gap

So, the gap detected from those upskilling needs evaluation shall be fulfilled taking into consideration the training programs that make the most sense for the organization. WE shall try to improve our capacity in:

- Knowledge of the biotech industry and current trends: Understanding the industry landscape, including regulatory requirements, market trends, and potential competitors, and all abilities to identify how can we help to position the members in a favorable light for potential investors.
- Understanding how to create a business plan, financial projections and how to present a compelling investment opportunity.
- Improving the technical expertise by reviewing the science behind the project and being able to clearly and effectively communicate the technical details to investors and other stakeholders.
- Improving our capacities to improve our networking activities by building relationships with potential investors, industry experts, and other stakeholders.
- Reviewing our abilities in sales and marketing to effectively market the Precision Medicine project and persuade other clusters to join it.
- Defining the project management in an effective way to be able to manage projects and timelines and help to demonstrate the ability to execute them successfully.
- Improving communication skills, being able to effectively communicate the objectives and its potential in a clear and compelling way

Also, to identify de upskilling needs for a more long-term perspective, keeping track of industry trends and determining what skills are becoming more important for Precision Medicine and identifying areas where the clusters are facing challenges or inefficiencies and determining if additional training or skills would help address these issues.

5. Actions by MEDIC NEST clusters towards a precision medicine strategical uptake

Starting from the implementation of the first three tasks of the WP3 *Updating cluster individual strategies and development of a pipeline of new services, a European Meta-cluster Strategy in Precision Medicine and a Joint Action Plan for Precision Cancer Medicine 2022-2027* and the subsequent tasks, the four MEDIC-NEST clusters have reviewed / created their strategies based on the outcomes of the following workshops:

- first workshop on strategic analysis of the cluster individual strategies in Leuven, Belgium on 22 – 23rd of May 2022 - organizer MEDVIA
- a second workshop on the strategic analysis of the innovation potential of life sciences-ICT cross-sector in the European value chain of personalised medicine, in Iasi, Romania, on 19th of October 2022 – organizer: IMAGO-MOL
- a third workshop on the update of cluster strategies and development of individual cluster roadmaps and portfolio of new services in Thessaloniki, Greece, on 25th of January 2023 – organizer: HBIO

➤ IMAGO MOL

In order to update its development strategy in line with precision medicine objectives, Imago-Mol Cluster has actively participated in the above-mentioned workshops organized within WP3, invited its key scientific members to the second workshop that was held in Iasi and also organized in June 2023 a working meeting with the members of the cluster in order to collect relevant inputs and to brainstorm on how to address the challenge of precision medicine implementation.

Furthermore, an analysis of the precision medicine value chain in IMAGO-MOL cluster has been performed in order to identify what are the missing links in the ecosystem of cluster's members. The advantage of the existence of members with areas of excellence both from the medical field and from the IT field, within the same cluster, becomes an advantage in terms of the development of retro-prospective research in the field of artificial intelligence, so valuable for the benefit of PPM.

Imago-Mol Cluster members acknowledged the increasingly important role of imaging in the era of precision and personalized medicine. The future of medicine, precision and personalized medicine (PPM), lies in early diagnosis and individually tailored treatments, aiming to deliver the right treatment to the right patient at the right time, including the theragnostic approach. As a consequence, the concepts of precision and personalized medicine were identified as a core direction of action within the cluster and lead to the update of various sections of the cluster strategy

The SWOT analysis integrated in the strategy was updated as a result of the first MEDIC-NEST Workshop. In addition to that, the concept of precision medicine was integrated in the mission and vision of the Imago-Mol Cluster. More specifically, *the mission of the IMAGO-MOL Cluster is to support the growth of the competitiveness of the cluster members, as well as the competitiveness of the North East Region in the targeted and tangents fields, by developing a cooperation framework based on the diversification and optimization of the use of medical imaging in an innovative way, aiming to improve the healthcare system in line with the principles of precision and personalised medicine.*

The vision of the IMAGO-MOL cluster is to be a cluster of excellence at European level, in the field of structural, functional and molecular imaging, based on innovation and international cooperation, to meet the challenges of the future in precision and personalised medicine.

The strategic directions of action of the cluster were updated following the working meeting organized in June 2023, as following:

- Development of research-development-innovation activities through the realization of collaborative projects in precision and personalised medicine
- Strengthening the institutional capacity of the IMAGO MOL Cluster, through knowledge and internal networking, as well as by attracting new members from the quadruple helix in precision and personalised medicine
- Increasing the level of training and specific skills at the level of cluster members through training activities and exchange of experience in the field of precision and personalised medicine
- Lobby and advocacy in the field of policies dedicated to the development of the medical imaging and precision & personalised medicine.

Nonetheless, the Implementation Plan of the IMAGO-MOL Cluster Strategy 2021-2027 and the indicators for monitoring the performance of the cluster were also updated in accordance with the newly introduced concept of precision and personalized medicine within the core directions of action of the cluster.

➤ **SIVI**

The global strategy for SIVI as cluster has been updated and submitted for local approval in July and it has included six strategic lines, that will be managed during the next period.

1. DEVELOPMENT OF NEW SERVICES
2. GROWTH
3. INFRASTRUCTURE
4. PARTNERS
5. VISIBILITY
6. TECHNOLOGICAL INNOVATION

Within these strategic lines, precision medicine is present all over them, but particularly in the strategic line 4 (Improve the satisfaction and involvement of existing members. Increase the number of members.) and in objective 4.1 section c (Develop specific activities for the sector), is where it will be more focused.

So, within strategic line 4 (PARTNERS), some actions that are included are:

- Increase research projects in precision medicine as the main objective of the MEDIC-NEST project.
- Establish a shared vision: about the potential and importance of precision medicine that can be achieved by identifying common objectives and clear benefits that this approach can bring to the health sector.
- Search for external consortia and other members, that work with precision medicine.
- Incorporate existing partners into the meta-cluster, consolidating the cluster.
- Connect different agents (industry, academia and investors) that work in precision medicine
- Create new oncology related projects.

- Create precision medicine platforms where partners can contribute with their news or project section, using the MEDIC-NEST interactive map for the identification of European projects and entities (clusters, infrastructures, research centers, main biobanks and foundations) that work in Precision Medicine, as well as a monthly news section.
- Negotiate with the EU to achieve new legislative frameworks on Precision Medicine, by presenting the strategic plan to the authorities, identifying the needs and trends among the members of the cluster and/or establishing periodic meetings with the legislative committee in the field of precision medicine.
- Increase the knowledge of the ecosystem, through the development of events, training, workshops, annual precision medicine congress, for both current and potential partners.
- Contact with Social Media Influencers of scientific dissemination for the population.
- Increase the specialization of precision medicine professionals.
- Create content for dissemination through social networks or dissemination platforms.
- Support members to progress in their entry to the market, with an adequate connectivity and digitalization infrastructure (financing rounds, networking, etc.).
- Increase the EU economy by helping the industrial sector to introduce more products and services into the precision medicine market: promoting research, creating incubators, with research centers
- Facilitate data sharing within the EU Precision Medicine network: have a panel of experts, use the Medic-Nest Grid platform, create a new database, assist in the development of services to evaluate facilities, infrastructure and new business models.
- Establish a coordinator for the field of precision medicine.
- Define a joint action plan for precision medicine.
- Create a program to support short-term exchanges to better connect ecosystems, funding for training, etc.

➤ **MEDVIA**

MEDVIA has been legally founded in September 2021 and became operational in January 2022 at the moment the CEO came on board. During the first half year, main focus was on hiring first employees and getting the governance structure organized which was finally done by summer time. Up till the end of 2022, setting up the organization and defining the first operational program was completely done according to the cluster dossier submitted to the government. This cluster dossier was originally at the basis of creating the health tech cluster in Flanders. In the mean time MEDVIA has continued working on further developing its strategy involving as much as possible its members. A services portfolio has been developed and is gradually deployed.

The execution of the Medic-Nest project ran more or less in parallel to this initial phase of the cluster development. This gave MEDVIA the opportunity to incorporate learnings from the project in their strategy development. Herewith you several examples where the impact from MEDIC-NEST is unmistakable.

- During the workshops, we identified several topics where the cluster can benefit from collaborating with other clusters. This confirmed the believe in cluster collaboration across borders. Therefore, the ambition to build strong relationships with other health tech clusters in Europe was explicitly taken along in the strategy (which was not in the original dossier).
- The Vanguard initiative on Smart Health (incl. personalized medicine) was recognized by all project partners as relevant for the development of cross regional funded projects, including projects for the members. MEDVIA explicitly decided to take its role in the Vanguard initiative

representing the Flemish HealthTech industry. Closely following or, if relevant, participating in relevant cross-regional initiatives like Vanguard is therefore part of MERDVIA's strategy.

- The meta-cluster (or EU cluster alliance) was recognized as an important tool to offer services with a EU scope to members. Therefore, MEDVIA is aiming to become member of such a meta-cluster on HealthTech also when the project MEDIC-NEST will be finished.
- MEDVIA is currently developing a portfolio of services. What was learned during the training sessions, e.g. being aware of the business case behind each individual service, is now taken into account when developing this portfolio.
- The strategy confirms that personalised medicine is one of the focus domains of the cluster and for the first couple of years we have selected the strategic themes data and ATMP which both are strongly related to PM.

➤ **HBIO**

Precision Medicine is a new frontier offering much promise for disease prevention and cure due to the tailored approach to health, taking into account genetic make-up, environment and lifestyle. The recent rapid advances in genomic medicine and the vast quantity of information now available, has resulted in major opportunities for precision health care, therapies and diagnostics.

Precision Medicine is a rapidly evolving market and many of the HBIO members already have development pipelines with products and/or services in the sector such as liquid biopsy kits, gene therapy, omics and imaging set to change treatment paradigms and improve clinical outcomes for patients in a number of therapeutic areas. However, the complexity of Precision Medicine offers unique challenges for life science SMEs (and translational academia moving towards the industry), as they grapple with the impact across their business - from R&D to supply chain, through to commercialization.

Through the MEDIC NEST workshops and trainings in the past 1.5yrs, HBio has identify the key opportunities, benefits, barriers and best practice examples in the development and further implementation of precision medicine into health care in Greece and beyond.

HBio has updated the service portfolio to members in order to include comprehensive offerings specific to Precision Medicine such as strategic front-end ideation and planning, to commercial, financial, and operational due diligence. The insight gained through the MEDIC NEST project and with the in-depth industry SWOT analysis, local market knowledge and critical insights from our highly specialized national Precision Medicine Networks, the 2023-2026 HBio strategy has been updated in order to include a clear roadmap to help members with key strategic decisions, assisting them into becoming market leaders in Precision Medicine.