CONTENT

Project InnoThyroGen

Innovating Thyroid Health with Genomics and Predictive Algorithms through Collaborative Excellence

About InnoThyroGen

Innovative Approach to Thyroid Disease Diagnosis and Treatment

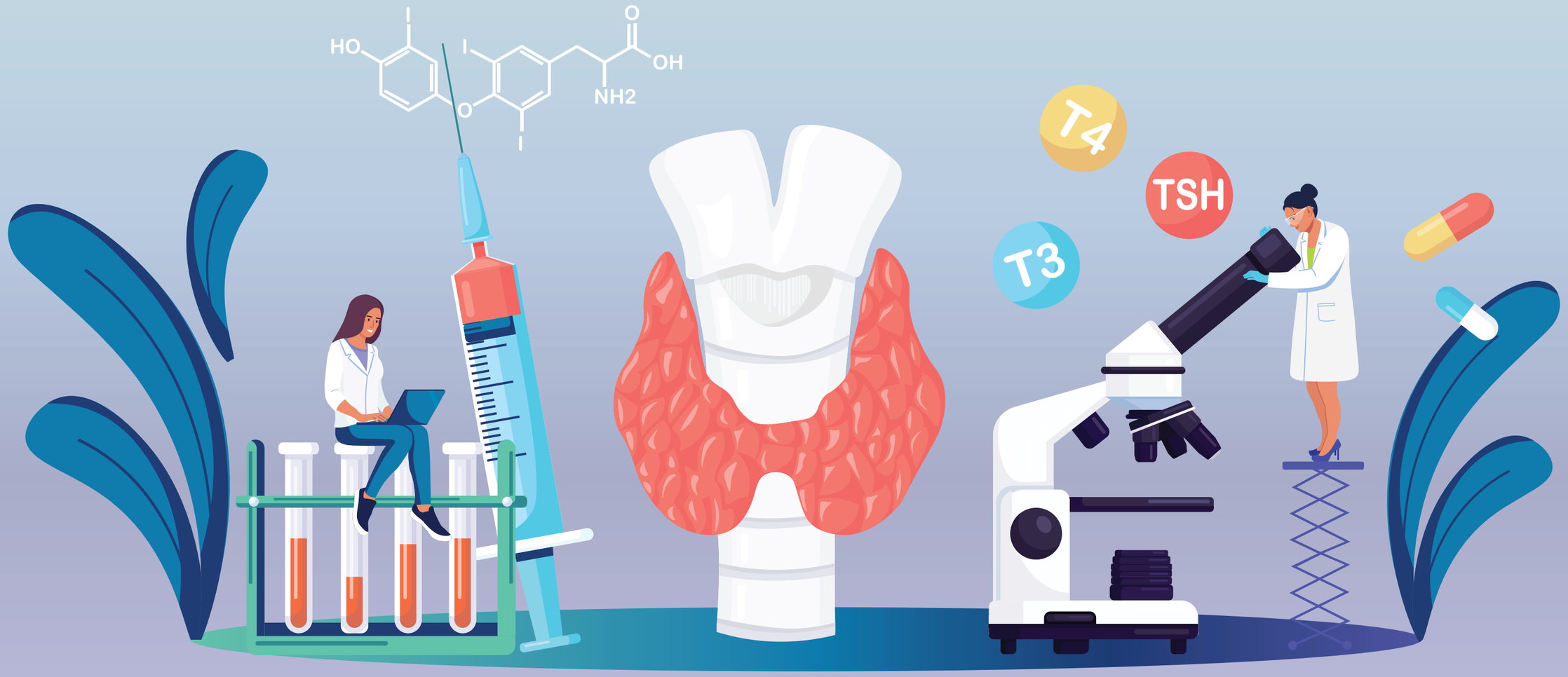
Thyroid diseases, such as Hashimoto's thyroiditis, Graves' disease, and thyroid cancer, affect millions of people worldwide, often remaining undiagnosed or misdiagnosed. Despite existing therapies, many patients face improper medication dosing, side effects, and ineffective treatments, leading to a reduced quality of life and increased healthcare costs. The main challenge lies in the fact that current treatments largely do not account for individual genetic predispositions and environmental factors.

Our project introduces a new, personalized approach to thyroid disease diagnosis and treatment, leveraging advanced technologies such as next-generation sequencing (NGS) and polygenic risk scoring (PRS). By integrating pharmacogenomics, electronic health records, and lifestyle data, we enable more precise risk assessment and tailored therapies. This approach allows healthcare professionals to better understand patients' specific needs and optimize treatment strategies, reducing the risk of side effects and ineffective interventions.

The development of specialized gene panels for thyroid diseases and the implementation of artificial intelligence in data analysis are key steps toward incorporating personalized medicine into clinical practice. These innovative solutions not only enhance existing treatment methods but also enable earlier disease detection and complication prevention. Our goal is to improve thyroid disease management, making it more precise, effective, and accessible to all patients.

InnoThyroGen is a collaborative research project dedicated to improving thyroid health through innovation in genomics, machine learning, and predictive medicine. With a multidisciplinary consortium of 13 partners from Croatia and Serbia, we unite academic institutions, healthcare providers, private companies, and patient organizations to address the global challenge of thyroid diseases. Our work focuses on delivering precise diagnostic tools, personalized treatments, and sustainable healthcare solutions.

By combining expertise across research, clinical applications, and technology development, we aim to bridge the gap between groundbreaking scientific discoveries and real-world healthcare needs.



Our Mission

Our mission is to transform thyroid disease management by developing innovative, patient-centric solutions that incorporate advanced genomics and artificial intelligence. Millions of people worldwide suffer from thyroid disorders such as hypothyroidism, hyperthyroidism, autoimmune diseases, and thyroid cancers, often undiagnosed or poorly managed.

At InnoThyroGen, we aim to reduce these gaps in diagnosis and care by providing tools that enable early detection, optimize treatments, and improve the quality of life for patients globally.

Our Vision

We envision a future where healthcare systems embrace personalized medicine to enhance patient care and outcomes. By establishing Croatia and Serbia as regional hubs of excellence in thyroid health research, we are setting the foundation for a broader European and global impact. Our vision includes creating long-term, sustainable models for innovation in thyroid healthcare that integrate seamlessly into clinical practice.

Through collaboration with stakeholders across academia, industry, and government, we strive to create a blueprint for tackling complex medi challenges in other fields as well.

Our Objectives

InnoThyroGen is driven by a mission to address pressing challenges in thyroid disease diagnosis and treatment. Through our carefully designed objectives, we seek to bridge research, clinical care, and technological innovation.

Enhancing Diagnostic Accuracy

Current diagnostic approaches often lead to misdiagnoses and delayed treatments for thyroid disorders. We aim to develop advanced clinical tools powered by machine learning and genomic insights to improve early detection and accurate classification of thyroid conditions, including autoimmune diseases and cancers

Advancing Personalized Medicine

Every patient is unique. We leverage whole-genome sequencing, next-generation sequencing (NGS), and pharmacogenomic analysis to tailor treatments to the individual genetic and environmental profiles of patients. This approach ensures more effective and safer treatment protocols

Building a Thriving Innovation Ecosystem

We are establishing strong collaborative networks between academic institutions, healthcare providers, and technology firms in Croatia and Serbia. By fostering knowledge exchange and collaborative research, we are creating a dynamic environment for continued innovation in healthcare

Empowering Healthcare Entrepreneurs

Innovation doesn't stop at the research stage. We actively support healthcare start-ups and spin-offs to bring research breakthroughs to market, enabling the development of new products and services that can improve clinical outcomes and patient care

Engaging Stakeholders and Ensuring Sustainability

Collaboration with clinicians, patients, and public authorities is critical to our success. By maintaining active engagement with these stakeholders, we ensure that our solutions are relevant, scalable, and sustainable beyond the project's timeline

Our Activities

InnoThyroGen encompasses a wide array of activities designed to foster innovation, improve clinical practice, and engage stakeholders.

Cutting-Edge Genomic and Machine Learning Research

We harness advancements in genomic technologies and machine learning to analyze complex datasets. By integrating next-generation sequencing (NGS) and polygenic risk scores (PRS), we aim to develop powerful predictive models for thyroid disease management

Development of Digital Health Solutions

A key focus of our project is creating user-friendly digital tools that combine genomic and clinical data to assist healthcare professionals. These solutions will seamlessly integrate with electronic health records (EHRs) to provide a comprehensive view of patient health, empowering doctors to offer personalized treatment options

Capacity Building and Training

We are investing in the next generation of healthcare innovators by organizing workshops, training programs, and knowledge-sharing initiatives with focus on genomics, personalized medicine, and advanced data analysis, ensuring that healthcare professionals are equipped with the skills needed to apply new technologies

Patient and Stakeholder Engagement

Patients are at the center of our innovation. We actively collaborate with patient advocacy groups to gather insights and ensure that our solutions address real-world needs. Public health authorities and healthcare providers are also key collaborators, helping to shape the practical application of our tools in clinical settings

Commercialization and Sustainability

To ensure the long-term impact of our innovations, we are developing business models and commercialization strategies for new healthcare solutions. We collaborate with private companies and investors to bring our research findings to market, creating a sustainable pathway for ongoing innovation in thyroid healthcare

HYPERTHYROIDISM

NORMAL THYROID GLAND

HYPOTHYROIDISM

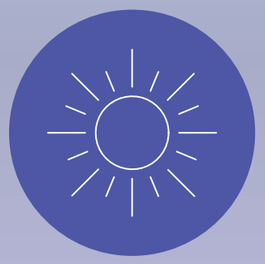
SYMPTOMS

Fatigue

Weight loss

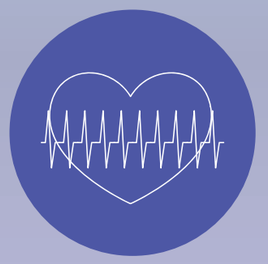
Diarrhea

Menstrual problems



Heat

Tremor of hands



Rapid heartbeat

Excessive sweating

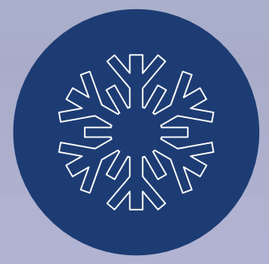
SYMPTOMS

Fatigue

Weight gain

Constipation

Menstrual problems



Coldness

Hair loss

Slow heartbeat

Our Partners

Bringing Together 13 Partners to Revolutionize Thyroid Healthcare Through Innovation and Collaboration

University of Split, School of Medicine

SVEUČILIŠTE U SPLITU
MEDICINSKI FAKULTET
UNIVERSITY OF SPLIT
SCHOOL OF MEDICINE

The University of Split School of Medicine (MEFST), established as an independent faculty in 1997, is one of the leading institutions for medical education and biomedical research in Croatia. It offers degree programs in Medicine, Dental Medicine, Pharmacy, and Medical Studies in English, with a commitment to scientific excellence, innovation, and international collaboration. MEFST combines education and research, ensuring students gain a strong foundation in both theoretical knowledge and practical clinical training. The faculty is engaged in cutting-edge biomedical research, particularly in genetics, epidemiology, public health, and clinical medicine. It participates in numerous national and international research projects, addressing key challenges in healthcare and disease prevention. MEFST also plays a role in translational medicine, helping to bridge the gap between scientific discovery and clinical application. Its researchers work closely with institutions worldwide, collaborating on studies that advance precision medicine, genomic research, and evidence-based healthcare. With over 200 researchers, PhD students, and staff, MEFST fosters an interdisciplinary academic environment, supporting student exchange programs, open science initiatives, and research training. Clinical education is conducted in partnership with the University Hospital of Split, where students gain hands-on experience in a real-world medical setting. The faculty also supports postgraduate studies, offering opportunities for specialization and academic growth. Through projects like InnoThyroGen, MEFST is advancing genetic research on thyroid disorders, contributing to biobank development and precision medicine. Its efforts in medical research, education, and innovation continue to shape the future of healthcare, both in Croatia and internationally.

University of Belgrade, Institute of Molecular Genetics and Genetic Engineering

Institute of Molecular Genetics and Genetic Engineering, University of Belgrade (IMGGE) is a leading research institution dedicated to advancing life sciences. Strategically oriented toward both fundamental and applied research, IMGGE specializes in molecular biology, molecular genetics, and genomics. With its modern infrastructure and dynamic research environment, IMGGE fosters innovation by connecting fundamental research with practical applications. By continuously pushing the boundaries of scientific discovery, the Institute contributes to improving human health, advancing biotechnology, and promoting environmental sustainability. By following modern scientific trends and continuously improving research methodologies, the Institute enhances expertise in understanding molecular mechanisms of diseases, precision medicine, biotechnology, and green technologies, actively participating in more than 90 national and international projects, reflecting strong commitment to scientific excellence and innovation. Among these, 10 projects are funded by the European Commission, highlighting the Institute's successful integration into the international research community and its ability to secure competitive funding. IMGGE has adopted a translational research approach, bridging fundamental discoveries with clinical and industrial applications. A major focus of IMGGE is the development of advanced omics sciences and bioinformatics, enabling high-quality genetic diagnostics and the implementation of personalized medicine. The Institute plays a crucial role in Serbia's healthcare system offering cutting-edge solutions for patient care and supporting the integration of genomic medicine into clinical practice. Beyond its research mission, IMGGE is committed to education and public engagement. The Institute actively mentors students at all academic levels, from undergraduate to doctoral studies, providing them with state-of-the-art knowledge and hands-on experience in modern molecular and genetic research. Additionally, IMGGE strives to make scientific knowledge accessible to the broader public through educational programs and outreach initiatives.

The Teaching Institute for Public Health of the Split-Dalmatia County

NASTAVNI ZAVOD
ZA JAVNO ZDRAVSTVO
SPLITSKO-DALMATINSKE ŽUPANIJE

Teaching Institute of Public Health of Split and Dalmatia County (TIPH) is the leading public institution in the field of preventive medicine in Split and Dalmatia County, dedicated to maintaining and advancing the health of all its citizens with more than 300 employees. Through combining scientific research, health policies and practical implementation, TIPH deals with disease prevention and control, as well as health promotion. TIPH actively monitors and examines the health impact of environmental factors and deals with the consequences of human interventions in the environment and the impact of environment and climate change on human health and biosafety. This institute participates in national strategies and response to crisis situations, including public health emergencies and natural disasters. Because the role of TIPH as the central point and source of health data, information and expert opinion, this institute has become important partner in creation public health policies on regional and national level. This institute put continuous efforts in quality management, while keeping pace with new norms and requirements, following the principles of continuous improvement and risk management. Such orientation has contributed to the fact that the TIPH is recognised as an indispensable factor in all activities undertaken to protect the health of the population in times when then they faced the unexpected challenge the entire world had to tackle during the pandemic caused by the SARS-CoV-2 virus. In addition to routine professional tasks, TIPH has had a respectable role in scientific research and teaching activities as a teaching base of Univeristy of Split. TIPH has remained ready and steady in its stated mission as the key preventive institution more than one hundred years, focused on contemporary public health issues, scientific research and education, with experts ready to respond to all future public health challenges.

The Office for Information Technologies and Electronic Administration of the Republic of Serbia

eUPRAVA | KANCELARIJA ZA IT I eUPRAVU

The Office for IT and eGovernment (OITE) is the agency of the Government of the Republic of Serbia, which develops ICT standards and manages electronic administration, ensuring the efficient functioning of government systems. It oversees the establishment and security of information systems, including AI and smart city initiatives. The Office provides cybersecurity services and supports digital transformation in the public sector. Additionally, it fosters international cooperation and public-private partnerships to drive innovation and sustainable economic growth in Serbia. Additionally, the Office is developing national infrastructure for eHealth. Operating under the oscipes of OITE, the Centre for the Fourth Industrial Revolution (C4IR) in Serbia is established with the World Economic Forum and the Government of Serbia, to advance the application of Fourth Industrial Revolution technologies. With a focus on biotechnology and AI in healthcare, it brings together scientists, industry leaders, and policymakers to drive innovation. The Centre facilitates the rapid utilization of scientific knowledge, positioning Serbia as a global leader in intelligent services. Additionally, C4IR Serbia supports the development of infrastructure, bioinformatics, and regulatory frameworks that balance technological progress. It is, also, invloved in several driver projects of the national initiative for healthcare digitalization, such as development of policies and information systems for centralized national electronic health records (eKarton), eSickLeave and Genetic and Biomedical Data Registry.

The Split Clinical Hospital Center

KBC Split

The University Hospital of Split is a public institution that provides hospital and specialist-advisory health care, scientific and research activities in the field of medical sciences. It organizes and provides services for conducting classes at the Faculty of Medicine of the University of Split and higher and secondary health schools. The University Hospital of Split is the largest hospital centre in Dalmatia, employing more than 4,000 employees. It is the central health institution of the Split-Dalmatia County and the entire southern region of Croatia, and is located in three locations in Split: Firule and Križine, and in one location outside of Split, in a Zagvozd branch. About one million citizens of the Republic of Croatia and about 500,000 residents of the southern part of neighbouring Bosnia and Herzegovina, as well as 500,000 tourists during the summer season, gravitate to our institution, as a regional hospital. The University Hospital of Split has 1,500 acute and 30 chronic contract patient beds and 24 operating theatres. Within the hospital, there are Directorate, OHBP, Hospital Pharmacy, 16 Clinics, 4 Clinical Institutes, 6 Institutes, 2 Departments and 12 Services. The University Hospital of Split has served for years as a test-bed for the development of innovations in healthcare through various clinical studies and collaborative projects with the economy. It operates directly with patients daily, providing first-hand insights into patient needs and outcomes. It has improved diagnosis, treatment and recovery and aims to build a truly supportive environment where researchers feel empowered to pursue bold ideas. This means providing spaces, resources, and incentives to encourage research that leads to transformative health solutions. Collaborating with the University Hospital of Split isn’t just a contribution to the healthcare field, it’s an opportunity to gain unique insights, access our clinical resources, and make a real difference in patient lives.

National Association for Improving the Position of Patients Patient Forum of Serbia

The 'Patient Forum of Serbia' is a non-governmental organization established with the mission to empower, educate, and improve the position of patient associations. Its core focus lies in facilitating the exchange of information, providing support, and offering education and training—all within a unified space that brings people together. This vision gave rise to the Forum's central message, which proudly resonates with all its members: "Educate, empower, unite." The association brings together more than 40 patient organizations from across Serbia. It is actively engaged in raising public awareness about the unique challenges and experiences of people living with various diseases. Among its members are individuals with significant international experience in advocating for patients' rights. In addition to its internal expertise, the Forum enjoys the strong backing of medical professionals and members of the media, who serve as vital partners in its mission. The Forum's activities focus on education, empowerment, and networking among associations, while also working to enhance health literacy and improve access to high-quality and sustainable healthcare for all. Patient inclusion and empowerment are at the heart of its initiatives, as is ensuring the long-term sustainability of patient organizations. Through the organization of professional lectures, seminars, and workshops, the Forum helps spread positive attitudes and fosters informed discussions on proper treatment approaches. It places particular emphasis on educating young people about patient rights, health conditions, and the importance of a healthy lifestyle. The association also publishes expert brochures, presentations, and other materials aimed at informing the public about its work and the conditions it advocates for, using various media channels to reach a wide audience. Collaboration with healthcare authorities is another key aspect of its mission, particularly in efforts to improve treatment conditions, diagnostic procedures, and therapy options. In parallel, the Forum offers psychological support to patients, works to combat discrimination, and facilitates the exchange of knowledge about different diseases. It maintains strong international ties, reinforcing its impact and enabling it to adopt global best practices in patient advocacy.

Croatian Association for Thyroid Diseases

The Croatian Association for Thyroid Diseases was founded in 2007 in Split and is the first association of thyroid disease patients in Croatia. It is a member of the international organization Thyroid Federation International (TFI). The association is actively engaged in raising awareness about thyroid diseases and offers continuous support to patients and their family members. Its work includes organizing seminars and gatherings aimed at educating patients, their families, and the general public, while also fostering mutual support among those affected. The association regularly informs the public about new and advanced methods of treating thyroid diseases and is involved in the development and active participation in international cooperation programs. It maintains close collaboration with healthcare organizations, institutions, and relevant authorities to address health issues related to thyroid conditions. In addition, the association publishes books and magazines related to its field of work, in line with specific regulations, and works to strengthen cooperation with similar organizations both within Croatia and abroad. One of its key annual events is a gathering that brings together patients, their families, and healthcare professionals to encourage the exchange of experiences and emotional support. It also arranges participation in international gatherings of thyroid disease associations, enabling the exchange of knowledge and practices on a global level. The first president of the association was Dr. Tomislav Budimir, an internal medicine specialist from Zagreb. The honorary president is Academician Zvonko Kusić, while the current president is Verica Mešić. Through its ongoing efforts, the Croatian Association for Thyroid Diseases continues to improve the quality of life for people affected by thyroid disorders, ensuring they receive the best possible care and support.

Persida

Founded in 2018, Persida d.o.o. is a tech-bio company specializing in the development of custom software solutions for the biotechnology and healthcare sectors. The company's mission is to accelerate the adoption of personalized medicine and revolutionize clinical workflows through advanced digital tools and data-driven insights. Persida's work covers a broad range of areas, including clinical variant interpretation and data linkage, the visualization of annotated variant data through platforms such as Genome Analyzer, and the development of custom patient management systems for hospitals and smaller clinics. The company also designs tailored laboratory information management systems (LIMS) for clinical diagnostic laboratories, automates the processing of hybridization panel data-including SNP imputation – and works on proteomic and genomic data interpolation. Additional expertise includes processing histopathological slide images, bioimage analysis, as well as the development of telemedicine applications and electronic medical records (EMR) systems. At the heart of Persida's approach is a commitment to delivering accurate, user-centric, and regulation-compliant solutions that address the complex needs of modern healthcare and biomedical research. Operating globally, the company collaborates with partners from clinical, academic, and biotech environments to bridge the gap between cutting-edge life science and real-world clinical application.

Polyclinic Leptir

Polyclinic Leptir is the first private healthcare institution in Croatia and the leading polyclinic specializing in thyroid diseases that Dr. Ante Škaro founded in Zagreb in 2008. The advantage of Polyclinic Leptir, in addition to its many years of experience, is that all services related to thyroid problems are offered in one place.

In addition to all services related to the thyroid gland, the activities of Polyclinic Leptir also include otorhinolaryngology, general surgery, anaesthesiology and endocrinology, diabetology, surgery of skin lesions and hemorrhoidal diseases. The Polyclinic also operates Bioleptir, a nutritional and phytotherapy counseling center with a biopharmacy.

Diagnosis and treatment are approached through quality communication, multidisciplinary approach, from a medical and nutritional perspective, taking into account objective diagnostic parameters and subjective clinical picture.

The preventive approach includes blood tests, an initial specialist examination with a thyroid ultrasound, and nutritional counseling.

The experts at the Leptir Polyclinic are available for specialist and follow-up examinations, and the director, Dr. Ante Škaro, rounds out the services with expert consultations and minimally invasive thyroid surgery, for which we are renowned. In past 15 years, we have performed over 12,000 different surgical procedures.

Our highly qualified and coordinated team is the guarantee of the best service!

Konistra

Konistra is a consulting company specializing in strategic advisory services, communication, and project management, with a focus on European projects in the fields of science, healthcare, innovation, and sustainable development. Through a multidisciplinary approach, Konistra connects academia, the healthcare sector, NGOs, and businesses with the goal of creating value for society and end users. The company develops and implements communication and dissemination strategies, prepares educational materials, organizes workshops, and ensures effective knowledge transfer among stakeholders. In the InnoThyroGen project, funded by the Horizon Europe program, Konistra plays a key role in shaping the communication and dissemination strategy.

It is responsible for promoting the project to both the general public and professional audiences, including developing visual identity, managing the website, social media, and promotional materials. Additionally, Konistra contributes to sharing project results among partners, stakeholders, and end users through educational activities, workshops, and knowledge exchange. It also supports coordination among pilot projects to ensure consistency and quality in implementation, and encourages the application of results within healthcare systems. By combining professional expertise with an innovative approach, Konistra strengthens the project's impact and ensures its messages and benefits reach all relevant stakeholders and the wider public.

Labena

Labena d.o.o. Croatia is part of the broader Labena Group, a regional leader in laboratory equipment distribution, scientific support and advanced diagnostic solutions across Southeast Europe. Labena d.o.o. in Croatia plays a key role in research and development, particularly in the fields of molecular biology, genomics, environmental monitoring and bioinformatics. With a strong interdisciplinary team of scientists and experts, Labena d.o.o. is actively involved in cutting-edge research projects, including the development of nucleic acid-based diagnostic tools, next-generation sequencing (NGS) applications and eDNA-based environmental assessments. The company also offers advanced bioinformatics support, including data analysis pipelines for omics research, contributing to innovation in both academic and applied scientific sectors. Labena's mission in Croatia is to bridge the gap between scientific discovery and practical implementation by providing tailored solutions, technical expertise and a collaborative research environment, making it a valuable partner in both public and private sector research initiatives.

Sharp Agency

Sharp Agency

At Sharp Agency, we specialize in delivering cutting-edge software solutions tailored to meet the specific needs of both enterprise clients and startups. With a strong foundation in the healthcare and manufacturing sectors, we have successfully empowered leading organizations to optimize their operations, boost efficiency, and drive continuous innovation. At the same time, we collaborate with emerging startups in areas such as security, messaging, and application development, helping them transform their ideas into scalable, high-performance digital products. Our solutions are built on the robust Microsoft technology stack, integrating the latest advancements in artificial intelligence, system development, DevOps, and modern frontend frameworks. We design intelligent AI systems that automate workflows and provide actionable insights, while our expertise in .NET ensures the creation of secure, scalable, and reliable applications tailored to individual business needs. With Azure DevOps, we streamline development pipelines to enable fast, efficient, and continuous software delivery. On the frontend, we craft smooth and engaging user experiences using state-of-the-art single-page application frameworks such as React and Angular. What sets us apart is our deep industry knowledge, particularly in healthcare, manufacturing, and startup ecosystems, combined with our ability to deliver complete end-to-end solutions. From the initial idea to final deployment, we manage every stage of the software development lifecycle. Our work is innovation-driven, guided by the latest technologies and best practices, and always grounded in a client-centric mindset. We work closely with each partner to ensure that our solutions align seamlessly with their goals, priorities, and long-term vision.

University of Split, Faculty of Science and Mathematics

In 2025, the Faculty of Science in Split proudly celebrates 80 years of academic excellence, research, and innovation. As one of the founding and oldest faculties of the University of Split, it has played a pivotal role in shaping generations of scientists, engineers, and educators. With approximately 1,040 students and 170 employees, it remains one of the university's largest and most dynamic departments. The Faculty is dedicated to cutting-edge research and high-quality education in natural, technical, and social sciences, with a growing emphasis on biotechnical and biomedical sciences. It offers programs in mathematics, physics, computer science, technics, biology, and chemistry, training future teachers and engineers. Its interdisciplinary doctoral programs in Biophysics and Education Research have gained increasing recognition, further solidifying its reputation for academic excellence. Committed to bridging science and society, the Faculty is highly active in science popularization. Through workshops, lectures, and collaborations with schools, it nurtures curiosity and fosters a love for STEM fields among young generations. It also plays a vital role in teacher training, ensuring the continued development of high-quality education in Croatia. As a partner in numerous international and domestic projects, the Faculty strengthens its research and innovation capacity, contributing to groundbreaking discoveries and real-world applications. Its collaborations with academic institutions, industry, and various sectors reinforce its role as a key driver of scientific progress. With a strong tradition, a forward-thinking approach, and an unwavering commitment to excellence, the Faculty of Science in Split continues to inspire and shape the future of science, education, and innovation.

SVEUČILIŠTE U SPLITU
PRIRODOSLOVNO - MATEMATIČKI FAKULTET
University of Split • Faculty of Science

Duration and Funding

By supporting the growth of healthcare start-ups and fostering the commercialization of new solutions, we are contributing to the economic development of the region. Our project serves as a catalyst for entrepreneurship and business innovation in healthcare.

01/01/2025
Project Start

31/12/2028
End Date

101187880
Grant agreement ID

48 months
Project Duration

13
Partners

4 937 275 €
EU Funding