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I3HIES

Boosting Interregional Innovation Investment and cooperation among Health Innovation EcoSystems

Press release no. 02

Study visit Lithuania

Insights into Lithuanian innovation health ecosystem

Study visit, 10th-12th June 2024, Vilnius, I3HIES project partners

The I3HIES project, dedicated to boost interregional innovation investment and cooperation among health innovation ecosystems, recently included a study visit in Lithuania, hosted by Lithuanian Innovation Centre. This visit highlighted the project's commitment to transform the healthcare sector through enhanced international collaboration and focused innovation. The consortium, consisting of nine partners from Hungary, Austria, Lithuania, Poland, Romania, Slovakia, and Slovenia, aims to address critical areas within the health sector, including medical devices, emergency equipment, and Medical Device Regulation (MDR) compliance. It was 3-days of intensive experience of visiting organisations & innovation actors, contributing to Lithuanian innovation health ecosystem.

SMART Health DIH

- **facilitator of healthcare ecosystem for digital transformation and innovation**
- **eDIH Vilnius consortium member**

SMART Health DIH has been established to build appropriate **frameworks and amounts of high-quality health data for high-performance computing** to enhance healthcare product design and testing, provide faster diagnoses, and deliver personalised health interventions. Key strategic directions include public sector data accessibility, telemedicine, clinical trials, international collaboration, and digital training, with main competences and expertise in AI & cybersecurity consulting, manufacturing of medical devices and tools, digitalization of various methodologies. Ongoing *project "*Digitalization and adaptation of Trauma-oriented cognitive behaviour therapy*"* results in an anonymization of sensitive children's data leading into digitalization and clinical trials with validation. An international collaboration in the "TRANSITION" project is recruiting trainers and trainees to improve digital skills in oncology and support the continuous professional development of healthcare workers.

Lesson learned:

- Digitalizing, integrating, and ensuring easy access to health information can significantly enhance the quality, efficiency, and accessibility of healthcare services.

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- Establishing an entity that unites academia, the public sector, and the private sector is vital for fostering collaboration and developing innovative health platforms.
- Interesting sessions of the scope of EDITH's planned activities indicate possible collaborations with Pomeranian Digital Innovation hub (INT), Digital innovation hub for society (Cluj-IT) as well as with HTS.

International collaboration opportunity:

- Looking for partners (SMEs, Research) to collaborate in the following fields: i) Digital twins, ii) Digital Health as collaboration in joint projects for the implementation and development of medical technologies, smart devices, methodology, iii) The inclusion of medical devices in the treatment process chain.
- Open call “Be a trainer / Be a Trainee” as a TRANSiTION education programme, addressing health professionals and non-clinical staff building a digital culture that is sustainable and adaptable to future opportunities for better cancer care across Europe: https://www.europeancancer.org/eu-projects/impact/resource/transition.html.

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Digital Health in Lithuania

- **Ministry of Health of the Republic of Lithuania**
- **Best practice of Secondary use of Health Data**

Since the beginning of 2008, when the Lithuanian Digital Health process started, several components have been developed: National Health Information Exchange platform, National registers and IT systems (Drug Register, Health care Specialist Licences, Blood Donor Register, Database of Nomenclature), Hospital information system (HIS) for regional and tertiary hospitals, E-prescription, E-scheduling for outpatient, E-referral, Free EMH portal, Patient portal.

Highlights for Central E-health System:

- Healthcare institutions are free to choose commercial Health Information System.
- Patient health records are in one system and accessible through patient portal, all health care providers and pharmacies, visited by patient can access these patient records.
- Automatically connected process of suspended health insurance with failure to issue a new driver's licence.
- Records in e-health register increased from 10.000 records in 2016 up to 94.000 records in 2023.
- Prescribed medications online purchase and delivery: pharmacies and prices displayed on dashboard, after selection of pharmacy store by patient, pharmacy online service enables approval and delivery.
- Currently 70.000 medications booking are done automatically per month.

Secondary use of health data, that regulates the process **of using health data suitable for repeated use,** achieving objectives important to society while ensuring the right to privacy and protection of personal data.

Highlights for Secondary use of Health Data:

- Lithuania adopted the Law on Secondary use of health data in 2021, which came into effect in July 2022.
- The State Data Agency (SDA) will issue permits for health data reuse if the data is used for one of following purposes: **Research and experimental development, Innovation, Education, Knowledge management in health, Health policy formulation, health care planning, organisation and management, Statistical management.**
- Complex process: SDA grants data permits when data is requested from multiple controllers or from the national eHealth system (ESPBI IS); Prepares meta data descriptions; Collects, links and pseudonymised or anonymised data; Ensures strict data

security (protection); Provides secure remote access system for data analysis – technical platform; Archives and utilises data.

- Trend of increasing usage & inquiry; the data is received in an anonymized form as an interoperable format.
- Main challenges: i) Health data maturity is insufficient to meet the needs of different stakeholders, ii) Targeting health data controllers towards data quality and promoting the enhancement of data value; iii) Lack of health datasets that add value.
- Inquiry examples: Residents with a history of schizophrenia or cancer, people who agreed to participate in biobank research, people who had breast cancer and were treated for it in Lithuania, people suffering from chronic obstructive pulmonary disease and treated with reimbursed drugs in 2020 – 2023.

Lesson learned:

- Digitalizing patient medical visits and prescriptions i) enhances the quality of medical services, ii) streamlines processes, iii) improves data management, and iv) increases the availability and security of healthcare services.
- The use and access of patient data sets, including patient consent, is a smart and useful approach that benefits both research and clinical practice.
- Particularly interesting was the integration in the system of pharmacies, and the different platforms available depending on the user (patient, doctor, pharmacy, data scientist). Very interesting that the patients can check the availability of the doctors/health organisation for a specific operation or treatment.
- Learning about the secondary use of health data is crucial for research in health science; on this basis there are possibilities for consortium partners to integrate / add this topic in planned co-creation events / activities.
- Interest for sharing good practice internationally (Pomeranian and Slovenian Regional authorities as well as to Slovak Centre of Health Information).

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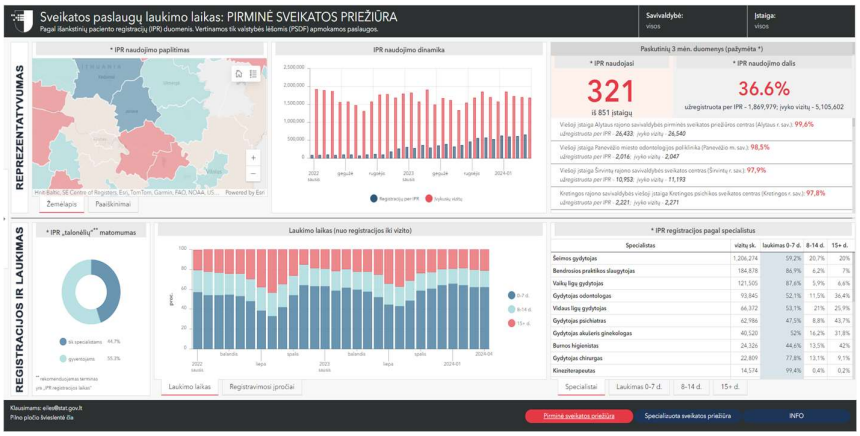
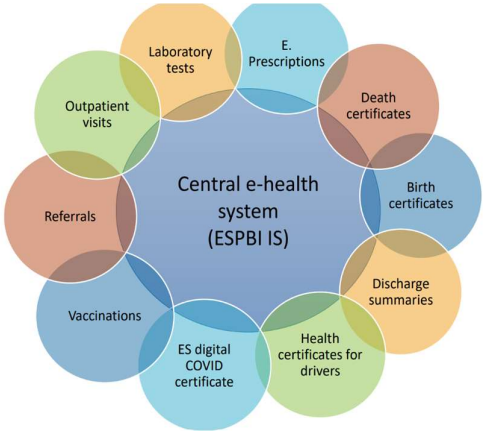
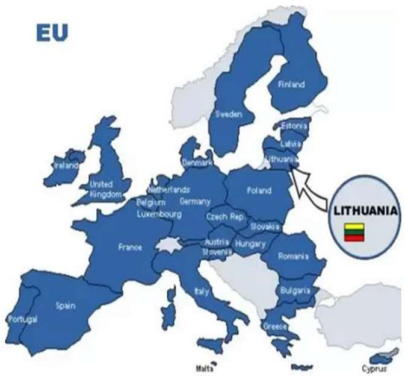


Health record types stored in National EHR





Lithuania stats:	
Size	65 300 km²
Population	2.73 million
Capital	Vilnius
Official language	Lithuanian
Currency	Euro
Health Care Institutions	900
Doctors specialists	13 200
Family doctors	2 300
Nurses	22 800
Dentists	3 200

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Association LithuaniaBio

- **Connecting the institutions of the Lithuanian life science and biotechnology sector**
- **Member of eDIH and EuropaBio**

Lithuanian Biotechnology association was founded in 2003, due to the increasing importance of biotechnology in the fields of science and economy. The goal of LithuaniaBIO is to promote the wider application of life sciences and biotechnology in the Lithuanian economy **in solving global environmental and quality of life challenges**. The life sciences sector is one of the priority sectors of the Lithuanian economy, currently accounting for around 2.6% of the country's GDP. Lithuania's goal is to reach 5% of the GDP generated by the life sciences industry by 2030.

LithuaniaBio presented the Lithuanian life science environment composed by many start-ups and SMEs, as well as universities and relative spin-offs. Their journey from local know-how to global biotech footprint results in several strong SMEs developing gene engineering (BioFa), enzymes and proteins (Thermo Fisher Scientific Baltics, In 2010, Fermentas Lithuania became part of the Analytical Technologies Division of Thermo Fisher Scientific) and Biopharmaceuticals (TEVA) as well as establishing European Molecular Biology Laboratory (EMBL). Prof. Dr. Virginijus Šikšnys, who won the Kavli prize in nanoscience, also works in their community. V.Šikšnys and other scientists founded Caszyme, LLC. They were among the first to show that CRISPR-Cas9 could be used to generate precise double-stranded DNA breaks. Their discovery helped usher in a new era of gene editing. Priority topics: i) Life science, ii) Health Technologies, iii) Bioeconomy.

Lesson learned:

- The biggest take-away message was how important it is to create a complex infrastructure and collaborative ecosystem, and how much it can help advances, especially considering it brings close together life sciences with the biotechnology sector.
- Presentation of "The Biocity idea" as Europe's largest biotechnology hub. It will be a living technology city combining the core areas of biotechnology research and production. The first biotech city of its kind in the Baltics, with the first complex expected to be operational in the second quarter of 2024, will feature 6 different complexes, ranging from Gene Therapy, R&D and Virology Centres, to Stem Cell

Research and 3D bioprinting laboratories. The total investment for this biotech campus is projected to reach approximately 7 billion euros over the next decade.

- Particularly interesting is the connection between almost winning a nobel prize and an influx of investments to the country. (prof. dr. Virginijus Šikšnys, contributed to the technology for Gene Editing).

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Baltic Sandoz Ventures

- **Headquarters in Vilnius &Tallin & Helsinki**
- **Looking for future heros on fields of LifeScience and DeepTech**

BSV invests in early-stage **R&D-focused individuals and teams solving complex technical challenges with large potential for commercial application**. Incubation program is free-of-charge and equity-free, with the possibility of getting the grant from 1000 to 5000 EUR per team. One of the initial challenges was collaborating with the State Data Agency as startups do not have data where they can train their products and do learning. Collaboration helped to understand where the need for open data is greater, as highlighted: *"By simplifying access to data, we empowered innovators to better understand the regulatory environment and accelerate breakthroughs in medical innovation towards improving patient care*".

Lesson learned:

- Beneficial insights regarding risk assessment of the business ideas from the investor point of view.
- Baltic Sandbox Ventures invests in scientists to give them the possibility to open a business, by giving them the instruments for entrepreneurship.
- Importance of close collaboration with Vilnius University Hospital Santaros Klinikos, Vilnius Universitates: Life Science Center and Faculty of Medicine, Lithuanian university of health sciences, Center for Physical Sciences and technology.
- DeepTech is the largest category within VC in 2023 (14.7 billion dollars), followed by the energy sector (11.9 billion dollars).

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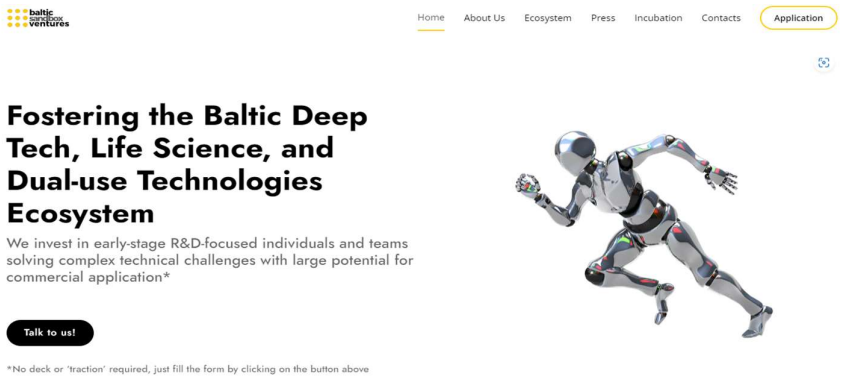

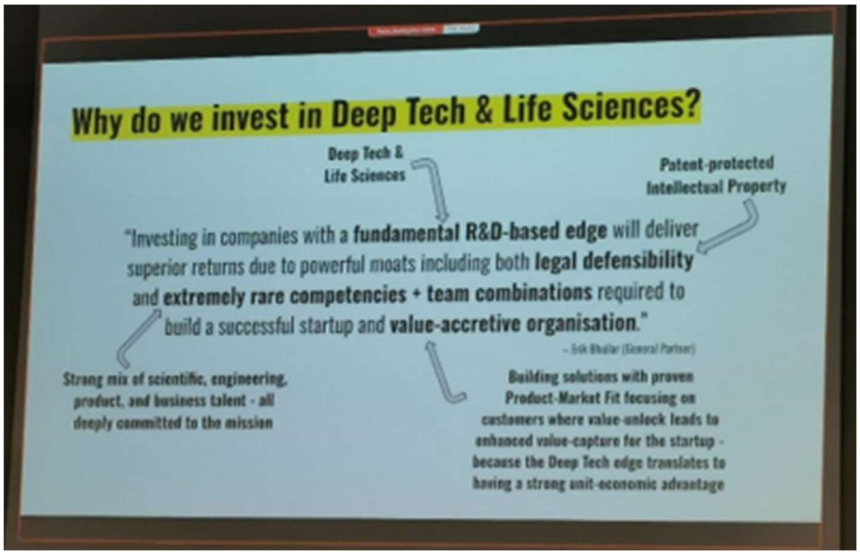

Centre of Innovative medicine

- **IMC as a part of national Biobank and member of BBMRI ERIC (The European research infrastructure for biobanking and biomolecular resources in health and life science)**

IMC is a State Research institute in which important long-term visions of therapeutic and diagnostic strategies are being implemented and translated from fundamental science into clinically relevant knowledge and expertise. They have the licensing to perform research on all levels**: in vitro – in vivo – preclinical – clinical** and active international and national network of business and research partners with more than 60 countries.
Major research groups and topics performed as six scientific departments: Department of Stem Cell Biology, Department of Regenerative Medicine, Department of Immunology and Bioelectrochemistry, Department of Personalized Medicine, Department of Biopharmaceuticals, Department of Preclinical Research.

Lesson learned:

- Information obtained can serve as a guide for searching for cooperation in a specific scientific institute focused on the sector of innovative biomedicine for the same purpose and as an idea for a concrete solution and for cooperation with I3HIES partners.
- Great example of interconnection, collaborative and cooperation approach.
- Due to the same field of research there is possible collaboration of UBB partners with groups working with extracellular vesicles in neurodegenerative diseases.

International collaboration opportunity:

- The Department of Stem Cell Biology, which conducts EVs research in the field of neurodegenerative diseases looking for partners for animal trials (mice for brain mutation), contact: augustas.pivoriunas@imcentras.lt.

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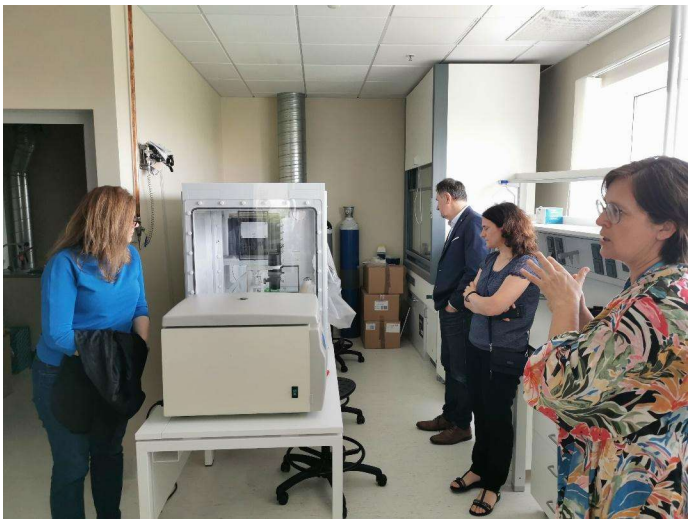

Life Sciences Center, Vilnius University (VU LSC)

- **Collaborating with Technological Business Incubator**
- **VU LSC-EMBL partnership institute on gene editing technologies**

Research areas: Biodiversity & Ecosystems; Chemical Engineering & Biotechnology, Biomolecule Structure & Function; Genome & Epigenome Editing; Mechanisms of Diseases & Biomarkers. Reaching publications cited in Nature, Science, Cell, Nature Reviews Microbiology and other scientific publications. Running 38 large, above 100 k EUR projects.

Since 2019 Vilnius University (VU) acts as a representative of Lithuania at EMBL, with a goal to further disseminate training and research possibilities for Lithuania scientists at all outstations of EMBL.
Strong industry collaboration is performed through licensing, industry contacts, joint projects and cooperation with startups, moreover supported by Technological Business Incubator.
Overview of the research and studies activities / teams:
VILNIUS UNIVERSITY LIFE SCIENCES CENTER 2022–2023 (vu.lt)

Lesson learned:

- Very well equipped laboratories for students, as Thermo Fisher Scientific Baltics has been a significant supporter of Vilnius University and the Life Sciences Centre for more than a decade, providing both financial and intangible support in terms of knowledge and expertise.
- Impressed to see that they have a dedicated laboratory to train the high school teachers in life sciences – something to think about to be implemented in other regions as well.
- Partners will look for topics for cooperation in the field of health innovations & education.
- The teaching environment is likely the most professional with the latest research tools and techniques, and with the biggest opening for the graduate students to go into biopharma, biotechnology companies.

International collaboration opportunity:

- for Companies: VU LSC search for partners to translate research results into biomedical products and diseases biomarkers, contact prof. Vytautė Starkuvienė-Erfle, vytautė.starkuvienė-Erfle@gmc.vu.lt

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BioBank

- **collection of biological material and related health information**

The aim of the Vilnius Santaros Klinikos Biobank is to provide the Lithuanian and foreign scientific and industrial community **with access to large volumes of standardised and structured samples of human biological material** in order to expand fundamental knowledge of various diseases and to optimise and improve the diagnosis or treatment of diseases. The Biobank operates as part of the Santaros Klinikos. The samples stored in the biobank are divided into collections for convenience, more information about which can be found on the portal: Vilnius Santaros Klinikos Biobank.

Lesson learned:

- The Biobank is a great resource for Health research and approach to data, referring also to the effort of the Lithuanian government to support the access of the researchers/medical companies to the patients' samples.
- Inhouse development of CAR-T cell therapy.
- An exclusive demonstration of how innovative medical cooperation can work within the healthcare system, admirable processing of samples for diagnosis, proposal of therapy (medicines) but also for the provision and sharing of "anonymized" samples for research
- sharing future plans for fundings and collaboration to ensure the possibility to preserve as many patient samples as possible.
- At some point with sufficient help and support (from government, medical institutions, hospitals), this centre could become one of the most important assets of Central Eastern Europe which can open the possibilities for even more impactful world-wide collaborations**.**

International collaboration opportunity:

- We are interested in collaborating on European or smaller scale projects in areas such as cryobiology, single cell-omics research, personalised medicine and advanced therapeutics. Contact: daniel.naumovas@santa.lt

Contact:

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www.hotc.lt/biobankas

Centre for physical sciences and technology (FTMC)

- **Open Access centre, solution for science and business**

FTMC was established in 2010 by joining institutes of Chemistry, Physics, Semiconductor Physics in Vilnius and Textile institute in Kaunas with the mission "**to generate and capitalise scientific knowledge for the benefit of society and the development of high technologies**". In the Center not only the innovative science but also high technologies expedient for business and society needs are developed. Over the recent years the Center combining different science branches has become one of the leading scientific institutions in Lithuania.

FTMC Services

Lesson learned:

- Presentation of a great cooperation between science and technology, as researchers from FTMC have great cooperation with LSC and are very willing to cooperate with researchers from all over the world.
- The centre for physical sciences hosts many laboratories which are focused more in the engineering rather than the medicine: i) lab of laser/optics where they use super-fast camera and lasers to take images of the inner layers of the eye; ii) the laboratory of electro biochemistry, where they show us a particular lab-on-a-chip / microfluidic device equipped with an electric cell, where they can do experiments with organoids and cancer cells.

International collaboration opportunity:

- Our developed organ-on-a-chip and micro physiological devices can open new perspectives in drug discovery and cancer research. However, achieving such high-impact outcomes requires collaboration with colleagues from other countries; contact: Dr. Arūnas Stirkė, a researcher at the Department of Functional Materials and Electronics of the Center for Physical Sciences and Technology.

Contact:

Mr. Karolis Stašys, Innovation and project manager, karolis.stasys@ftmc.lt
https://www.ftmc.lt/en/

Study visit in Lithuania did confirm the quote: “Ubiquitous digitalization improving the quality of healthcare for patients in the first place requires constant development and adaptation to more and more innovative solutions.”
Takeaways:

- Vilnius is a great model of R&D business development
- All visited institutions are open to collaborate
- Finding opportunities to transfer insights from Lithuanian health policies to improve the digitalization of the health sector locally / regionally as the Lithuanian eHealth system is very advantaged and in line with the standards that Europe is setting up
- Identifying some potential synergies with local ecosystems in our I3HIES regions.

Prepared: Technology park Ljubljana, 1.7.2024