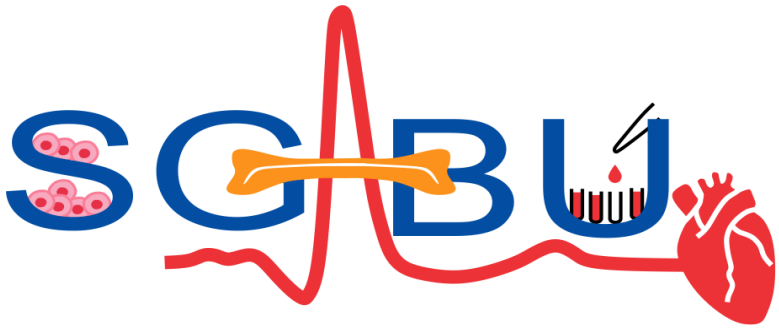

Project Title: *Increasing scientific, technological and innovation capacity of Serbia as a Widening country in the domain of multiscale modelling and medical informatics in biomedical engineering (SGABU)*

Coordinating Institution:
University of Kragujevac (UKG)

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Authors	UKG (Katarina Bogdanović, Milena Đorđević, Nenad Filipović)
Contributors	All partners
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1.0	Final version and submission to the EC portal	29/02/2024

Disclaimer

Executive summary

This report provides a comprehensive overview of successful technology transfer and intellectual property commercialization initiatives within the field of biomedical engineering at SGABU beneficiaries. It aims to offer valuable insights and inspiration to early stage researchers, encouraging them to adopt an open mindset towards research valorization. By highlighting these success stories, the report equips researchers with the knowledge and motivation to pursue similar initiatives. Moreover, it serves as a useful database for identifying potential collaborators and partners for future projects and collaborations.

The Report also includes summaries of online Q&A sessions between CEOs of spin-off companies and researchers from UKG, offering additional insights and perspectives. Ultimately, it concludes with an overview of best practices observed in the work of the presented companies, providing valuable guidance for those embarking on technology transfer and commercialization endeavors.

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1. Introduction

This report is designed to showcase successful stories from spin-off companies within the fields of multiscale modeling and medical informatics in biomedical engineering, as outlined in the SGABU project application. It aims to provide guidelines and recommendations for UKG researchers based on these success stories. Since some beneficiaries focus on both spin-off and startup companies, while others focus on spin-out ventures, the report focuses on companies that can serve as best practice examples and inspiration to early-stage researchers. Information on successful stories is organized by beneficiary, detailing a list of spin-off/spin-out/startup companies created at each university within the broad domain of biomedical engineering. The information for the report was compiled from data available on the websites of technology transfer offices and spin-off/spin-out/startup companies affiliated with the universities. For each company website and contact information was provided.

2. Success stories of KUL

KU Leuven has a rich tradition in research valorization, with a particular emphasis on the establishment of spin-off ventures. A significant factor contributing to its success lies in the robust infrastructure provided by its esteemed tech transfer office, known as KU Leuven Research & Development (https://lrd.kuleuven.be/en). Over the years, total of 142 spin-off companies were established at KU Leuven. The Spin-off & Innovation Unit of KU Leuven Research & Development (LRD) is active in supporting researchers in transforming their innovative ideas and technologies into new and promising high-tech companies. They help them to develop a business plan, validate the market, put together a strong team, grow their company, etc.

Moreover, KU Leuven Research & Development offers a publicly accessible online platform dedicated to spin-off education and insights (https://lrd.kuleuven.be/en/spinoff/spin-off-learning-platform). The Spin-off Learning Platform houses an extensive repository of invaluable resources elucidating the intricacies involved in establishing and growing spin-off companies.

ADx A FUJIREBIO COMPANY	Company website: https://adxneurosciences.com/ Contact details: Technologiepark 6, 9052 Gent

General description, products and successes:

ADx NeuroSciences specializes in cutting-edge biomarker assays tailored for neurodegenerative diseases, including Alzheimer's disease, Parkinson's disease, and traumatic brain injury. By creating custom antibodies and assays, ADx NeuroSciences quantifies unique biomarkers crucial for early detection, even before symptoms manifest. This information proves invaluable from drug development stages to clinical practice, ultimately enhancing patient outcomes.

Central to ADx NeuroSciences' approach is their collaborative ecosystem, uniting various stakeholders in the neurodegenerative biomarker field. Through strategic partnerships, they foster innovation and drive advancements in diagnostics and treatment discovery, with the ultimate goal of positively impacting patients' lives:

- Leveraging close ties with an extensive academic network, ADx NeuroSciences gains access to the latest breakthroughs and innovations in neurodegenerative biomarkers.
- They apply these biomarkers and antibodies in collaboration with pharmaceutical companies to support drug development efforts and advance clinical research.
- Working alongside in vitro diagnostic (IVD) partners, ADx NeuroSciences translates developed tests into user-friendly kits for automated platforms, facilitating their integration into clinical trials and everyday clinical practice.

Through these collaborative efforts, ADx NeuroSciences aims to revolutionize the landscape of neurodegenerative disease diagnosis and treatment, ultimately making a positive impact on patient lives.

ARTIQ	Company website: https://www.artiq.eu Contact details: Professor Roger Van Overstraetenplein 5 3000 Leuven, Belgium, email: info@artiq.eu

General description, products and successes:

ArtiQ envisions a future where every medical professional receives support from artificial intelligence in their daily practice, leading to enhanced decision-making, increased time for human interaction, and ultimately, better patient outcomes. Their mission is to empower medical professionals with AI tools for accurate and timely diagnosis, treatment, and patient follow-up in the realm of lung diseases. With a steadfast commitment to addressing pertinent clinical challenges, ArtiQ focuses on developing AI applications that are not only clinically relevant but also practical for everyday use. Their dynamic team of young professionals is dedicated to delivering innovative solutions to respiratory medicine, collaborating closely with researchers, clinicians, equipment manufacturers, and pharmaceutical companies to drive key advancements in patient care.

ArtiQ's flagship software, ArtiQ.QC, seamlessly integrates into existing clinical trial platforms, offering instant AI-based analysis of spirometry data. This enables study sites and participants to receive prompt feedback on data quality, facilitating immediate improvements if necessary. Whether conducted in-clinic or at-home, spirometry measurements can now benefit from AI-based over-reading through ArtiQ.QC. Additionally, ArtiQ.RBM serves as an AI-enabled risk-based monitoring tool, addressing variations in expertise among study sites conducting spirometry. By detecting sites in need of retraining and identifying potential data fraud, ArtiQ.RBM helps prioritize action points for improved data integrity and study quality. Through their innovative AI solutions, ArtiQ is at the forefront of transforming respiratory medicine, paving the way for more efficient, accurate, and patient-centric care.

Aspect Analytics	Company website: https://www.aspect-analytics.com/ Contact details: C-mine 12, 3600 Genk, Belgium, email: info@aspect-analytics.com

General description, products and successes:

Aspect Analytics is a leading bioinformatics solutions provider specializing in spatial omics technologies, with a particular focus on mass spectrometry imaging. Their comprehensive offerings include platform solutions for data management, bioinformatics, and reporting, complemented by joint research and custom development services tailored to meet individual needs. With profound expertise in

bioinformatics, machine learning, and mass spectrometry, Aspect Analytics develops cutting-edge software solutions to address the complex challenges of spatial omics research.

They provide purpose-built tools and workflows for various pharmaceutical studies, including quantitation and untargeted analyses using mass spectrometry imaging. Additionally, Aspect Analytics prioritizes multimodal analysis, integrating other imaging technologies such as LC-MS, and offers differential expression and multimodal analysis tools to enhance research capabilities. Driven by a visionary mission, Aspect Analytics aims to illuminate the spatial complexity of biology through advanced bioinformatics, ultimately revolutionizing spatial multi-omics research. Their overarching goal is to facilitate groundbreaking discoveries that have the potential to transform global health and well-being.

Their research papers based on their research is available: https://www.aspect-analytics.com/research-papers.

BioRICS	Company website: https://www.biorics.com/ Contact details: Technologielaan 3, 3001 Heverlee, Belgium, email: support@biorics.com

General information, products and successes:

BioRICS is dedicated to enhancing the well-being, health, and performance of individuals and teams by leveraging objective, real-time measures from the body to provide personalized insights. Through the development of advanced algorithms and expertise in human condition monitoring, including physical condition, mental status, sleep quality, and sleepiness, BioRICS aims to identify factors that impact energy levels and provide tailored recommendations. Drawing on 30 years of research conducted at the M3 BIORES lab of the Faculty Bio Engineering at KU Leuven, BioRICS has honed its technology to deliver real-time algorithms that offer unparalleled accuracy and customization. Unlike traditional population-based statistical models, BioRICS' algorithms adapt to each individual over time, continuously refining parameter estimates for optimal performance in diverse environments.

BioRICS' flagship products include Mindstretch, InfectAlert, and MyFocusZone. Mindstretch provides daily insights into mental energy usage and recovery based on physiological measurements, empowering users to make small lifestyle adjustments for significant improvements in mental well-being. InfectAlert utilizes objective monitoring data to alert users to potential health risks, while MyFocusZone leverages athlete-specific mental energy data to determine the optimal focus zone for peak performance during games or races. By translating objective body measurements into actionable insights, BioRICS strives to revolutionize how individuals and teams manage their well-being and maximize their potential.

CARTAGENIA.com	Company website: http://www.cartagenia.com/ Contact details: Technologielaan 3, 3001 Heverlee, Belgium, email: support@biorics.com

General information, products and successes:

Cartagenia specializes in providing diagnostic knowledge, software, database systems, and related services tailored for genetic labs and clinicians. Their primary aim is to facilitate quick and efficient genetic analyses, empowering healthcare professionals to offer high-quality genetic interpretation and counseling to patients and caregivers.

Through cloud-based workflows and innovative diagnostic test pipelines, Cartagenia equips genetics labs with the tools to establish internal knowledge bases. These databases encompass predictive, prognostic, diagnostic, and functional evidence of genetic variants, enabling technicians and clinicians to visualize clinical genetics data for patient assessment and reporting.

Moreover, Cartagenia fosters data-sharing and knowledge-gathering initiatives focused on rare diseases, facilitating the delivery of actionable insights for patients. In a significant development, Cartagenia was successfully acquired by Agilent Genomics Applications and Solutions in 2015, further consolidating its position in the field of genetic analysis and interpretation.

CoMoveIT	Company website: https://comoveit.com/ Contact details: Baron Ruzettelaan 5/1.1, 8310 Assebroek (Brugge), Belgium, email: info@comoveit.com

General information, products and successes:

The CoMoveIT team is dedicated to its mission of delivering top-tier personal mobility solutions for individuals who have been overlooked by outdated technology. Driven by the belief that mobility is a fundamental human right, CoMoveIT is passionate about leveraging artificial intelligence (AI) to enhance people's medical conditions and overall well-being, particularly in cases where traditional human capabilities are limited. In line with this vision of human-centered engineering, CoMoveIT strives to integrate advanced AI, rehabilitation expertise, and mechatronics technology to maximize independent mobility for individuals with severe motor disabilities. One of their key innovations is the development of a smart steering system for powered wheelchairs, which incorporates evidence-based technology alongside cutting-edge sensors and intelligent algorithms. Notably, this system is compatible with major wheelchair brands and R-Net, and it is designed to be user-friendly without requiring programming skills.

CoMoveIT has also expanded its reach through joint ventures and activities in partner countries such as UK. For example, the launch of CoMoveIT Smart in the UK was achieved through close collaboration with DIETZ Mobility UK, demonstrating their commitment to making their innovative solutions accessible to a global audience.

custom8	Company website: https://www.custom8.be/ Contact details: Romeinse Straat 18, 3001 Heverlee, Belgium

General information, products and successes:

Custom8 is a company with extensive expertise in ergonomics, rehabilitation, and medicine, specializing in designing personalized products tailored to individual needs. Over the past decade, Custom8 has dedicated its efforts to the bedding sector, offering a range of customized solutions to optimize sleep systems and enhance comfort. Drawing on their collaboration with the Division of Biomechanics and Engineering Design at the University Hospitals of Katholieke Universiteit Leuven, Custom8 has developed a solid research foundation. This partnership enables them to continually innovate and bridge the gap between engineering and medicine.

Custom8's product offerings include individualized spinal drill guides, customized bedding, and a variety of body measurement equipment and sleep advice systems designed for use in bed stores. They also provide biomechanical, mechanical, and micro-climatic testing services for bedding products, assisting manufacturers in developing and optimizing sleep systems. The company firmly believes in the profound impact of custom-made goods on human welfare and well-being. They advocate for the use of information technology to streamline the customization process, ensuring that personalized products remain accessible without significant cost increases. Through their dedication to innovation and collaboration, Custom8 strives to improve the quality of life for individuals by delivering tailored solutions that prioritize comfort and support.

Dualyx	Company website: https://www.dualyx.com/ Contact details: contact@dualyx.com, Technologiepark 94, 9052 Zwijnaarde, Belgium

General information, products and successes:

Dualyx, a biotech company based in Ghent, is committed to pioneering innovative Treg-based therapies for patients grappling with challenging autoimmune diseases. Founded in 2020 by Luc van Rompaey, the company operates in collaboration with esteemed partners such as Wurzburg University, Argenx, VIB, Ghent University, and KU Leuven.

At the forefront of Dualyx's pipeline is DT-001, an antibody agonist program targeting the TNF receptor 2 (TNFR2), a pivotal regulator of immunosuppression. With TNFR2 considered a key player in Treg therapies, DT-001 is currently undergoing IND-enabling studies, demonstrating significant potential for treating autoimmune conditions.

Dualyx is recognizable by its focus on developing immune modulators designed to expand regulatory T cells (Tregs) in vivo. By enhancing and activating potent Tregs, Dualyx aims to rebalance the regulatory-to-effector T cell ratio, thereby suppressing autoimmune reactions and offering lasting or curative benefits to patients. Through advanced antibody engineering techniques, Dualyx has created a pipeline of multi-specific antibodies that selectively target Tregs while sparing other immune cells, promising effective immune suppression with improved safety profiles.

Supported by a consortium of reputable investors, including Fountain Healthcare Partners, Forbion, Andera Partners, and others, Dualyx collaborates with industry and academic partners such as Argenx, Wurzburg University, KU Leuven, and VIB to advance its pipeline of innovative therapies.

In addition to DT-001, Dualyx is progressing with DT-002, targeting a well-established immune suppression target, and DT-003, a novel program addressing a new immunological pathway. These programs hold

significant potential to revolutionize autoimmune therapy by offering novel mechanisms of action, reduced toxicity, and improved patient outcomes compared to traditional treatments.

FOX BIOSYSTEMS	Company website: https://foxbiosystems.com/ Contact details: BioVille, Agoralaan Abis, 3590 Diepenbeek Belgium, email: info@foxbiosystems.com

General information, products and successes:

FOx BIOSYSTEMS is a dynamic company dedicated to transforming the life science and pharmacological research sectors through groundbreaking real-time, label-free analysis products. At the core of their innovation lies a cutting-edge fiber-optic-based surface plasmon resonance (FO-SPR) biosensor, enabling users to obtain high-quality biomolecular data quickly, accurately, and across a wide range of applications.

One of their flagship products, WHITE FOxTM, features an ingenious fiber-optic probe setup that merges a fluidics-free dip-in protocol with the precision and speed of surface plasmon resonance (SPR) technology. This unique design allows for direct use in complex samples such as lysates, whole blood, or large particles. With easily interchangeable probes, users can detect various target molecules including antibodies, nanobodies, microvesicles, phage, and small molecules using a single device. The absence of fluidics eliminates concerns of clogging or the need for frequent cleaning, streamlining the analysis process. Additionally, the interchangeable probes come in a range of surface chemistries, enhancing flexibility and versatility for diverse research needs. FOx BIOSYSTEMS' achievement of ISO 9001 quality management certification underscores their commitment to continuous improvement and customer satisfaction, ensuring that their products meet the highest standards of performance and reliability.

FOx BIOSYSTEMS collaborated on various projects under funding schemes such as Interreg Vlaanderen-Nederland, EIC, Link2Innovate, VLAIO to drive innovation in life science and research analysis. On December 20th, 2022, FOx BIOSYSTEMS was awarded an EIC accelerator grant for their ambitious project to bring to market a combined quantification and isolation application for extracellular vesicles (EVs) unlocking their great potential in diagnostic applications.

icometrix	Company website: https://www.icometrix.com/ Contact details: Kolonel Begaultlaan 1b / 12, 3012 Leuven Belgium, 3mail: info@icometrix.com

General information, products and successes:

Icometrix, established in 2011 in Leuven, Belgium, is dedicated to leveraging data-driven insights and artificial intelligence (AI) to enhance personalized patient care. Specializing in neurological disorders such as multiple sclerosis, brain trauma, epilepsy, stroke, dementia, and Alzheimer's disease, we offer a comprehensive portfolio of AI solutions to address various healthcare challenges.
Today, Icometrix operates internationally and is integrated into over 100 clinical practices, providing support to pharmaceutical companies across phase I-III and Real-World Evidence (RWE) studies. Their mission is to democratize evidence-based care by offering digital, data-driven, integrated, and scalable

solutions. The icobrain portfolio, their cloud-based AI solutions, assists healthcare professionals in adopting treatment guidelines by providing imaging and data analytical services for clinical practice and early- to late-stage clinical development (from phase I to Real World Evidence).
In recognition of their groundbreaking work, Icometrix received significant grants and awards. In 2023, Icometrixc was awarded a grant by The Michael J. Fox Foundation to research brain MRI biomarkers for Parkinson's disease. Additionally, in collaboration with Queen Mary University of London, they received the prestigious AI Award from the National Institute for Health and Care Research (NIHR) to explore the impact of AI applied to MRI in the care of individuals with multiple sclerosis (MS).

Loci ORTHOPAEDICS	Company website: https://www.lociorthopaedics.com/ Contact details: No4 Business Innovation Centre, National University of Ireland Galway, Ireland, info@lociorthopaedics.com

General information, products and successes:

Loci Orthopaedics develops a new life-changing, ergonomic orthopaedic joint implant for thumb base joint arthritis, a common but crippling joint condition. Loci Orthopaedics is a medical device spin-off from KU Leuven and the National University of Ireland Galway (NUIG).
Their key products are InDx implant, the only implant that can fully mimic the natural but complex motions of the thumb joint, and OsteoAnchor, a new surface architecture for orthopaedic stem components which incorporates a multitude of tiny anchor features for embedding into the bone during implantation. It provides improved primary fixation compared to existing surface coatings.
The InDx device accommodates the full range of thumb joint motions by providing two points of rotation that can move both concurrently and independently of each other, while enabling the joint to move in at least six degrees of freedom. The InDx device offers an exciting new, patient sensitive treatment option to patients and surgeons and has been designed in conjunction with three of the world's leading hand surgeons ensuring all end-user requirements are met.
OsteoAnchor uses a 3D printed surface architecture to gently but securely embed into the patient's host bone, resulting in improved primary fixation and resistance to micromotions once the patient starts walking again. A network of interconnected pores underneath the claws ensures proper in-growth of hard bone, and excellent long-term fixation. The surface incorporates a multitude of tiny anchor features which embed into the bone during implantation that can provide up to 76% greater resistance to transverse motion under simultaneous normal loading compared to porous tantalum.

materialise	Company website: https://www.materialise.com/en Contact details: Technologielaan 15, 3001 Leuven, Belgium, email: medical@materialise.be

General information, products and successes:

Materialise originated as a spin-off company from KU Leuven in 1990 and has since evolved into a prominent global player in the Additive Manufacturing (AM) industry, boasting a workforce of over 1,000 employees. Renowned for possessing the largest capacity of AM equipment in Europe, Materialise has

secured its position as a market leader in 3D printing and Digital CAD software. Additionally, the company has made significant contributions in medical and dental image processing, as well as surgery simulation, particularly in the fields of orthopaedics and maxillofacial implants.

At the core of Materialise's offerings is the Mimics Innovation Suite, which simplifies the utilization of 3D medical image data for engineers and researchers aiming to enhance patient care through technological advancements rooted in anatomical geometry. This suite provides advanced tools for developing innovations tailored to orthopedic, cranio-maxillofacial, cardiovascular, and other clinical applications.

Materialise also offers specialized suites such as the Phits Suite, designed for foot and ankle experts, which enables dynamic data analysis to generate orthotic recommendations. The Footscan Suite, featured in over 3,000 scientific studies, offers robust hardware and software solutions for biomechanical research on gait, movement, and pressure analysis.

Furthermore, Materialise provides 3-matic Medical, a comprehensive software package for 3D printing, design, and remeshing. This tool allows users to leverage anatomical data for designing personalized devices, preparing anatomical models for printing, and creating finite element models for simulation purposes, ensuring better-fitting devices and accurate representations in engineering and simulation endeavors.

medicim	Company website: https://www2.medicim.com/ Contact details: Stationsstraat 102, Mechelen, Begium, email: info@medicim.com

General information, products and successes:

Medicim operates within the realm of medical image computing, focusing on developing innovative solutions grounded in medical imaging to enhance diagnosis, therapy, and surgical procedures. Central to their software products is the interaction with image data, which forms the foundation of their offerings. Their target applications encompass various areas, including 3D image-based planning software tailored for oral implant surgery and maxillofacial surgery, as well as augmented intra-operative visualization systems. In 2008, Medicim was acquired by Nobel Biocare, further solidifying its presence in the medical imaging sector.

One of their flagship products, the DTX Studio™ Clinic software, serves as a comprehensive platform for managing 2D and 3D imaging data for diagnostics, treatments, and follow-ups. It streamlines image acquisition, supports import and export functionalities, and provides multi-room access on both Windows® PC and Mac® operating systems. The software offers unified diagnostic views through features like SmartLayout™ and SmartFocus™, enabling instant access to the complete 2D and 3D imaging history of specific teeth with a simple click. Additionally, the DTX Studio Implant module facilitates implant planning for various implant systems based on patient anatomy and prosthetic requirements. Whether utilizing surgical templates or 3D navigated implant surgery, this module empowers clinicians to plan and execute implant procedures with precision and efficiency.

MONA	Company website: https://www.mona.health/about/ Contact details: info@mona.health

General information, products and successes:

MONA is a Belgian healthcare startup, backed by KU Leuven and the Health Unit of VITO, Flanders' state research and technology agency. With a diverse team of experts in biomedicine, life sciences, machine learning, and health-IT, MONA is on a mission to revolutionize retinal screening for diabetes-related eye conditions.

Their goal is to make the screening process comfortable, fast, and affordable for both patients and healthcare systems, ultimately leading to better medical outcomes. By enhancing access to screening for vision-threatening conditions like diabetes or glaucoma, MONA aims to help patients safeguard their vision. Traditionally, screening for diabetic retinopathy required an ophthalmologist. However, MONA's innovative AI-driven solution allows screening to be conducted by a nurse or technician, expanding accessibility and efficiency. Compatible with images from most fundus cameras, MONA serves as an AI software as a medical device, facilitating seamless integration into existing healthcare workflows.

MONTIS BIOSCIENCES	Company website: https://www.montisbio.com/ Contact details: info@montisbio.com

General information, products and successes:

Montis is dedicated to leveraging cellular interactions between perivascular macrophages (PVMs) and tumor vasculature to bolster and sustain immune responses against solid tumors. Their mission is to develop groundbreaking therapeutics that enhance the immune gatekeeping function of the perivascular microenvironment, ultimately improving the lives of patients.

With a team of talented and committed scientists and professionals, Montis continuously pushes the boundaries of scientific innovation. Guided by a steadfast commitment to patients, they uphold the highest standards of quality and ethics while striving for excellence in all aspects of their work. Embracing change and challenging conventional thinking, Montis fosters a collaborative environment where individuals from diverse backgrounds and perspectives can thrive and contribute authentically.

Their research has revealed that the interaction between endothelial cells and PVMs plays a crucial role in shaping the immune suppressive response within the tumor microenvironment. By targeting this interaction, Montis aims to restore the immune environment. Leveraging single-cell RNA sequencing data and a unique target screening platform, Montis has identified novel targets to translate this concept into a pioneering therapeutic pipeline.

MyCellHub Streamlined biomanufacturing	Company website: https://www.mycellhub.com/ Contact details: Kempische Steenweg 303/200, 3500 Hasselt Belgium, info@mycellhub.com

General information, products and successes:

MyCellHub is focused on developing a cutting-edge data management and analytics platform tailored for the biopharmaceutical production sector. Their innovative software as a service (SaaS) platform is designed to revolutionize the way cleanroom operators manage production processes, particularly in the realm of cell and gene therapies. Traditional paper-based documentation methods have long been a bottleneck in the industry, consuming valuable time and leaving room for human error. MyCellHub addresses this challenge by providing cleanroom operators with a user-friendly tablet app equipped with interactive work instructions. By automating data collection and reporting tasks, their platform delivers substantial efficiency gains, especially considering the prevalence of paper-based record-keeping among bio-manufacturers.

The regulatory paperwork associated with Good Manufacturing Practices (GMP) poses significant challenges, often hindering the widespread availability of life-saving treatments. MyCellHub aims to tackle this issue head-on by offering an end-to-end SaaS solution for GMP data management. From batch recording to cleanroom cleaning, their platform eliminates paperwork, reduces errors, ensures compliance with quality standards, and facilitates data-driven optimization of operations. At the heart of MyCellHub's approach is the belief that batch records should be intelligent and interactive. By making batch records intuitive and unlocking valuable insights, they empower bio-therapeutic companies to streamline processes, enhance quality, and ultimately democratize access to cell and gene therapies, transforming lives in the process.

pulsify medical	Company website: https://pulsify-medical.com/ Contact details: Philipssite 5, bus 1 – 3001 Leuven, Belgium, email: info@pulsify-med.com

General information, products and successes:

Pulsify Medical started in the summer of 2019. They are based in Leuven, Belgium, home to world renowned research institute imec and the university Leuven. These are their strategic partners, contributing cutting edge knowledge and research in support of their unique device Pulsify patch.

The current challenge in cardiovascular care lies in the need for both short- and long-term cardiac monitoring, particularly in intensive care units (ICUs) and beyond. Despite this need, there is currently no solution available for directly, accurately, safely, and continuously monitoring cardiac output. Recognizing this gap in the market, Pulisfy Medical is on a mission to address this significant unmet need.

Pulsify Medical's innovative solution comes in the form of flexible and wearable ultrasound patches capable of real-time monitoring of cardiac pumping efficiency over extended periods. This technology is user-friendly and non-invasive, offering a practical and affordable alternative for cardiac monitoring, particularly in home care settings. In contrast, traditional ultrasound probes are handheld devices suitable only for short-term use and cannot provide continuous monitoring of cardiac performance. Pulisfy Medical's solution thus represents a paradigm shift in cardiac monitoring, opening new possibilities for improved patient care and management.

Qaelum	Company website: https://qaelum.com/ Contact details: Kolonel Begaultlaan 1B, 3012 Leuven (Wilsele), Belgium

General information, products and successes:

Qaelum, founded in 2011 by Prof. Dr. Ir. Hilde Bosmans, Prof. Dr. Raymond Oyen, and Ir. Jurgen Jacobs, is dedicated to enhancing the quality and efficiency of radiology departments in hospitals globally. Through their innovative software solutions, Qaelum strives to elevate patient safety and diagnostic quality in medical imaging. The company's journey began with the development of MAMMO, a quality assurance software tool designed to improve quality control in mammography screening. Originally implemented at the University Hospitals Leuven, MAMMO quickly garnered attention from other medical institutions seeking enhanced quality control measures. With the issuance of the Euratom directive 43/97 on radiation protection, the demand for quality control in radiology environments surged. Qaelum's software proved instrumental in meeting this need, providing medical professionals worldwide with a comprehensive tool for quality control and monitoring.

As Qaelum's activities expanded, they developed additional solutions to address evolving challenges. The creation of DOSE, their second solution, focused on monitoring patient radiation dose, further solidifying their commitment to patient safety. Subsequently, they extended their portfolio to include BASELINE, a manual assessment tool for radiology departments, and COACH, a quality management system. Today, Qaelum's software solutions are utilized in over 16 countries worldwide. They have embarked on international expansion efforts and continue to innovate, developing new tools to advance patient safety and quality control in medical imaging environments globally. Notably, Qaelum places a strong emphasis on quality management, with their quality management system certified to ISO 13485:2016 for Medical Devices. Additionally, they hold ISO 27001 certification for Information Security, and some of their tools are CE class IIb certified and FDA compliant, reaffirming their commitment to excellence and regulatory compliance.

runeasi	Company website: https://runeasi.ai/ Contact details: Westgrijpen, Esperantolaan 7, 3300 Tienen, Belgium, email: Contact form on the website

General information, products and successes:

Runeasi specializes in providing wearable technology tailored for runners, offering valuable insights to help prevent and recover from injuries. Their innovative platform enables runners to train and rehabilitate more efficiently, ultimately enhancing performance and reducing the risk of setbacks. At the core of Runeasi's offerings is their Master Running Technology, a comprehensive platform designed to empower users with the knowledge and skills necessary to leverage running technology effectively. Through this platform, individuals can optimize their training regimens and achieve remarkable results.

Moreover, RunEASI emphasizes the importance of sharing knowledge and data with clients, fostering trust and transparency in the process. Their platform facilitates the effective communication of valuable information to clients, enhancing the overall training experience. Additionally, Runeasi enables users to fine-tune their training interventions by translating individualized results into tailored recommendations for exercise therapy and running gait retraining. By analyzing running gait with their validated single biomechanics sensor, users can track the acceleration of their body's center of mass and make informed adjustments to improve outcomes.

Key to RunEASI's technology is their high-end sacral sensor, which accurately measures impact on the body and monitors the body's response in real-time. This sensor is seamlessly integrated into the RUNEASI belt, designed specifically for running activities and engineered for precision and comfort. The belt features an anti-slip grip and adjustable design to accommodate various waistlines. Complementing their hardware is the Running Gait Analysis App, which translates data into actionable insights for both users and clients. By incorporating objective assessment data, this app facilitates informed decision-making and contributes to better outcomes in training and rehabilitation.

Overall, RunEASI's comprehensive approach to wearable technology and data analysis offers runners a valuable toolset for optimizing performance, preventing injuries, and achieving their fitness goals.

VIPUN Medical innovative nutrition devices	Company website: https://www.vipunmedical.com/ Contact details: De Regenboog 11 bus 21, 2800 Mechelen, Belgium, email: info@vipunmedical.com

General information, products and successes:

VIPUN Medical specializes in innovative medical technology designed for gastro-intestinal applications and the management of medical nutrition. Their focus lies in the development of novel medical devices aimed at aiding in the diagnosis and treatment of patients with gastro-intestinal disorders.

One of their flagship products is the ANTERO Gastric Evaluation System, which facilitates the diagnosis of gastric motility disorders through the direct measurement of gastric contractions. Another key innovation is the VIPUN Gastric Monitoring System, which streamlines the decision-making process for medical staff involved in nutrition therapy. By providing timely and well-informed decisions, the VIPUN system aims to mitigate malnutrition and reduce feeding-related complications.

Both the VIPUN and ANTERO catheters are equipped with balloons that are inflated within the stomach. The VIPUN Catheter features a dual lumen tube, allowing for gastric access to facilitate aspiration or the administration of nutrition directly into the patient's stomach. Crucially, their Gastric Monitoring and Evaluation Systems, including VIPUN and ANTERO, utilize the inflated balloon to verify and secure the correct placement of the tube within the stomach during both initial placement and ongoing use, achieved through pressure measurement within the balloon. The variations in intraballoon pressure, influenced by gastric contractions, serve as key indicators for monitoring and evaluating gastric motility. This functionality aids healthcare professionals in diagnosing conditions such as gastroparesis or enteral feeding intolerance, thus empowering them to provide effective and personalized care to patients. Among successfully conducted and published clinical studies (NCT03664570, https://www.vipunmedical.com/vipun-medical-announces-topline-results-for-the-antero-3-clinical-study/ , https://onlinelibrary.wiley.com/doi/full/10.1111/nmo.13733), in July 2020, Baxter International Inc, a global leader in clinical nutrition, and VIPUN Medical announced an agreement to commercialize the VIPUN Gastric Monitoring System. In March 2022, VIPUN Medical was awarded ISO 13485:2016 certification and announced the inclusion of the first subject in the LOTUS Clinical Investigation at the University Hospital Leuven, Belgium, and the positive results of the study were published in June 2023. Overall, the results were in line with the investigation hypotheses and supported the conclusion that this direct comparison versus the gold standard provides solid evidence on the performance of the VIPUN GMS as a gastric monitoring system. The LOTUS Investigation was performed at the Translational Research Center for Gastro-intestinal Disorders (TARGID) in the University Hospital Leuven led by Prof. Dr. Jan Tack.

3. Success stories of TUW

Research and Transfer Service Unit at TU Wien (https://www.tuwien.at/en/tu-wien/organisation/central-divisions/rti-support/research-and-transfer-support) supports individual scientists and research teams at TUW in various research and transfer activities. A major aim of their social mission is the transfer of its research-based knowledge and competence to society for public benefit. Another essential objective of Research and Transfer Service Unit's activities is the national and international positioning of TU Wien as an excellent research institution. Currently, TUW has over 30 spin-offs and start-ups covering different fields such as applied artificial intelligence, cybersecurity, smart cities, augmented reality, bioengineering, etc.

contextflow	Company website: www.contextflow.com Contact details: contextflow GmbH, Margaretenstraße 70/2/8, 1050 Vienna, Austria, email: office@contextflow.com

General information, products and successes:

Contextflow is an Austrian startup that began as part of the Medical University of Vienna (MUW) and Khresmoi European research project. They are also supported by the Technical University of Vienna (TUW). Founded in July 2016, contextflow was awarded that same year the Most Promising Startup Austria by the BCS Search Industry. In 2017 contextflow received the Digital Innovation Award from the Austrian Federal Ministry of Education, Science and Research. Later in 2018, they were selected as one of 19 startups out of 700+ applications to participate in the Philips HealthWorks accelerator program. In 2019 they won Best Pitch - Healthcare at the Pioneers Festival in Vienna, and the Central European Startup Awards awarded us Best Healthcare Startup Austria. Contextflow's co-founders include leading AI and medical imaging experts with over 40 years' combined experience in machine learning on medical image data and creation of efficient AI software development frameworks and 250+ peer reviewed publications for machine learning and image processing in medical computer science. And our international advisory board includes the current president of the European Society of Radiology, the president of the International Society of Radiology as well as the Head of Radiology at the General Hospital of Vienna (AKH). Currently, contextflow is testing their 3D image-based software with international proof of concept partners throughout Europe.

The flagship product offered by contextflow is the ADVANCE Chest CT, designed to provide comprehensive qualitative and quantitative insights for objective reporting on suspected cases of lung cancer, Interstitial Lung Disease (ILD), and Chronic Obstructive Pulmonary Disease (COPD). This advanced system incorporates modules dedicated to various aspects of chest CT analysis, including nodule detection, nodule tracking, lung tissue analysis, and 3D image search. By integrating these functionalities, the ADVANCE Chest CT enables healthcare professionals to make informed diagnostic decisions with greater accuracy and efficiency.

The development of these tools is underpinned by a robust scientific foundation, as evidenced by a series of publications available for reference on the contextflow website at https://contextflow.com/science/. Moreover, contextflow has expanded its reach through joint ventures and activities in partner countries

such as Austria, Belgium, Greece, Serbia, and the UK. Notable collaborations include partnerships with esteemed institutions like Cambridge University in the UK, the Medical University Vienna, and the Innsbruck University Hospital in Austria. These collaborations underscore contextflow's commitment to advancing medical imaging technology through strategic alliances and research partnerships on a global scale.

nanographics	Company website: https://nanographics.at Contact details: Nanographics GmbH, Marxergasse 24/2, 1030 Vienna, Austria, email: hello@nanographics.at

General description, products and successes:

Nanoscale biological processes, like gene editing and DNA replication, remain hidden from direct observation due to the limitations of traditional microscopes. To convey these intricate processes, animations become indispensable. However, creating realistic animations is often prohibitively expensive, leading to simplified and schematic representations. Enter Nanographics, a software company addressing this challenge by offering tools that streamline the creation of scientifically accurate animations down to atomic resolution. Their software seamlessly integrates into the workflow of scientific illustrators, expediting both modeling and rendering processes for biological structures. Moreover, it enables the deployment of animations into virtual reality and other immersive environments, facilitating the creation of captivating, interactive installations for educating large audiences on complex molecular processes. This innovative tool serves multiple purposes: it accelerates the workflow of scientific animators, aids biologists in effectively communicating their findings, and empowers science centers and museums to present cutting-edge science to diverse audiences.

Nanographics excels not only in scientific animations but also in interactive applications, leveraging over a decade of experience in real-time graphics software development. They deliver ideas through interactive applications and innovative platforms like virtual reality and large cinematic screens. Furthermore, Nanographics produces professional software tailored for various scientific visualization applications, encompassing volume rendering, molecular rendering, flow visualization, and more. Their expertise extends to the visualization of scientific data, exemplified by their groundbreaking creation of the first authentic 3D visualization of the SARS-CoV-2 virion. Collaborating with esteemed scientific partners from Tsinghua University and KAUST University, they transform cryo-electron tomography scans into captivating animations, pushing the boundaries of scientific visualization. Relevant scientific publications can be found at https://nanographics.at/publications/.

upnano	Company website: www.upnano.at Contact details: TRICORE, Modecenterstraße 22/D36, 1030 Vienna, Austria, email: office@upnano.com

General description, products and successes:

UpNano stands as a leading provider of high-resolution 3D printing solutions, offering a comprehensive array of services ranging from system development and production to software integration. Committed to excellence and environmental responsibility, UpNano proudly holds ISO 9001 and 14001 certifications, underscoring its dedication to quality and sustainability. At the forefront of their offerings is the NanoOne, renowned as the fastest high-resolution 3D printing system available. Leveraging multiphoton lithography, NanoOne combines the precision of 2-photon polymerization with unparalleled throughput, exceeding >450 mm³ per hour. This exceptional capability renders the system not only ideal for scientific research and multi-user facilities but also for industrial batch and small series production of microparts.

Interactive customization options further enhance NanoOne's versatility, allowing customers to tailor the system with additional modules to suit specific needs. These modules can be seamlessly retrofitted at any point, ensuring adaptability to evolving requirements. UpNano's high-performance 2-photon materials are meticulously optimized to maximize the potential of NanoOne printing technology. Offering a range of photopolymers, sol-gel hybrid materials, and hydrogels tailored for biological applications, including those tested for cytotoxicity according to EN ISO 10993-5:2009, UpNano provides versatile solutions for diverse printing needs. One standout material collaboration with Cubicure yields a heat- and impact-resistant photopolymer, specifically designed for UpNano printing technology. With an impressive Heat Deflection Temperature (HDT-B) of up to 300 °C, this material enables high-resolution, high-temperature applications for micro components. Whether executing predefined structures or custom CAD designs, NanoOne emerges as the preferred choice for a wide range of high-resolution applications. Supported by the intuitive THINK3D user software, UpNano ensures a seamless printing experience from start to finish, empowering users to achieve exceptional results with ease and efficiency.

PREGENERATE	Company website: https://www.pregenerate.net Contact details: Pregenerate GmbH, Dr.-Bohr-Gasse 7/3/311, 1030 Vienna, Austria, email: office@upnano.com

General description, products and successes:

Pregenerate GmbH develops scalable organ-on-a-chip models designed to elucidate the response of cartilage cells to inflammation and diverse treatments in a biologically authentic manner. This groundbreaking technology aims to revolutionize patient care by enabling the stratification of individuals into targeted treatment subgroups, ultimately providing personalized arthritis therapy recommendations. Moreover, the innovation intends to significantly benefit pharmaceutical companies by potentially saving billions of dollars and enhancing the success rates of their drug candidates. This is partly achieved through the substitution of animal testing with human cell-based assays for arthritis drug research. Central to Pregenerate's approach is the development of cartilage-on-a-chip technology, comprising fully functional healthy and diseased cartilage-like structures that mimic the progression of osteoarthritis. Furthermore, the ability to interconnect multiple devices via minute fluid-filled channels facilitates the study of cellular responses to various drug interventions.

Pregenerate's diagnostic tool, protected by patents and accredited with CE marking and ISO 13485 certification, employs gene expression profiling via qPCR testing of the patient's own cells. This innovative approach allows for the identification of optimal treatment options within a remarkably short timeframe of just six weeks. The benefits of this solution are manifold, including expedited pain management,

reduced patient frustration, improved long-term treatment outcomes, and a potential decrease in the need for joint replacement surgeries. In addition to its transformative impact on arthritis care, the optimated OA platform promises substantial benefits for pharmaceutical companies. By offering a sustainable alternative to animal testing and facilitating precise patient stratification, this technology opens avenues for unparalleled data mining capabilities, paving the way for more efficient drug development processes and enhanced patient outcomes.

NovoArc	Company website: https://novoarc.at Contact details: NovoArc GmbH, Pottendorfer Straße 23-25, 4, 4-1, 1120 Vienna, Austria, email: office@novoarc.at

General description, products and successes:

NovoArc specializes in providing tetraether lipids tailored for formulations involving small molecules, proteins, and nucleic acids. Utilizing patented technology, we produce unique lipids designed to safeguard active pharmaceutical ingredients (APIs) from degradation while enhancing their efficacy.

Their approach involves harnessing extremophilic archaea for lipid production. Thriving in harsh environments characterized by low pH and high temperatures, these organisms have evolved robust cell walls to withstand such conditions. The key to their resilience lies in the ether linkages of saturated phytane chains, which resist hydrolytic and enzymatic cleavage. Additionally, the saturated nature of the carbon chain backbone enhances resistance to oxidation. In comparison to conventional lipids with interlaced (un)saturated carbon chains bonded by ester bonds, tetraether lipids exhibit superior stability against oxidative, hydrolytic (pH 1.0 – 10.0), thermal (>140°C), and enzymatic challenges. These exceptional properties enable tetraether lipids to endure the gastrointestinal tract environment, including pH variations, enzymatic activity, and bile salts, making them an appealing option for diverse API delivery needs. NovoArc employs a patented biotechnological process for continuous lipid production. This process adheres to strict quality standards, ensuring consistency, reproducibility, and scalability in accordance with Quality by Design principles.

Their tetraether lipids find application across various industries, with a primary focus on pharmaceutical applications. Specifically, we specialize in facilitating oral delivery of small molecules and proteins through liposomes, as well as nucleic acid delivery via lipid nanoparticles. With a commitment to innovation and quality, NovoArc is dedicated to advancing drug delivery technologies and improving patient outcomes.

CompreVie	Company website: https://www.comprevie.com/ Contact details: CompreVie GmbH, Taubstummengasse 11, 1040 Vienna, Austria

General description, products and successes:

CompreVie is a startup established in 2022 in the field of *in vitro* diagnostics. Founded by individuals with diverse expertise spanning engineering, *in vitro* modeling, biology, and business, the company is unified by a singular mission: to revolutionize pre-clinical testing by developing platforms that authentically reflect the complexities of the human body and its environment. Through this approach, CompreVie aims to enhance the efficacy of therapies while advocating for the ethical treatment of animals. At the heart of their innovation is the CompreChip, a lab-on-chip device engineered to mimic physiological conditions. This cutting-edge technology utilizes controlled pneumatic actuation of a flexible membrane to mechanically stimulate, or wound tissues cultivated within its microchannels. Whether investigating cell migration dynamics or exploring the impact of compressive stress on cell behavior and morphology, the CompreChip offers a versatile platform for scientific inquiry. Remarkably compact, with dimensions comparable to a microscope slide, the CompreChip seamlessly integrates with various image analysis systems. Its compatibility with multiple adherent cell types enables a broad spectrum of research applications, ranging from studies on cutaneous wound healing to investigations into brain trauma and cancer cell behavior. Through its innovative design and functionality, the CompreChip empowers researchers to conduct sophisticated studies that advance understanding of human biology and disease mechanisms.

cogvis	Company website: https://cogvis.ai/cogvis-en/ Contact details: Prinz Eugen Straße 8-10/12, 1040 Wien, email: office@cogvis.ai

General description, products and successes:

Cogvis GmbH was established in 2007 as a spin-off from TUW, seamlessly merging 3D technology with artificial intelligence from its inception. Leveraging cutting-edge research findings from both technology and healthcare sectors, the team at cogvis has been dedicated to advancing technology transfer and product development. In 2011, cogvis embarked on an extensive research endeavor focused on fall detection, laying the groundwork for their innovative smart care solution, cogvisAI. Following an intensive development phase, the first prototype of cogvisAI was successfully completed in 2014. The market launch of hardware generation 1.0 marked a significant milestone for cogvis, garnering acclaim from the Austrian health and care sectors for its pioneering technology. Subsequently, cogvis conducted the largest field study in care globally between 2020 and 2021, utilizing versatile research outcomes to further optimize cogvisAI's effectiveness in real-world settings. By early 2021, cogvisAI achieved the perfect product-market fit, offering a comprehensive solution for safety, fall detection, dementia, and activity monitoring across approximately 20 different use cases. This success propelled cogvisAI's expansion into new markets in Sweden, Switzerland, France, and Germany within just one year.

Currently, cogvis operates thousands of sensors daily, facilitating the detection of over 100,000 falls and providing preventive support over 1,500,000 times. Notably, cogvisAI has contributed to a remarkable 72% reduction in falls. In 2023, cogvis made history as the first company in Europe to launch the second generation of sensors, culminating a decade of expertise. The cogvisAI 3D-smartsensor 2.0 represents a paradigm shift in care standards, prioritizing the safety and well-being of older individuals by introducing state-of-the-art technology designed to simplify and safeguard their lives.

4. Success stories of COVU

Coventry University has a strong and flexible support system for prospective spin-out ventures via its Intellectual Property Commercialisation web-pages (https://www.coventry.ac.uk/business/our-services/intellectual-property-rights/). Coventry's business support teams offer access to their industry expertise, academics and research centers, thus further supporting researchers and nurturing cooperation with outside partners.

Feraru Dynamics	Company website: https://ferarudynamics.co.uk/ Contact details: Techno Centre, Puma Way, Coventry CV1 2TT

General description, products and successes:

Feraru Dynamics is an innovative company dedicated to designing, engineering, and collaborating on the production of reliable wearable monitoring devices. Their primary focus is on promoting proactive staff health management within the manufacturing industry. Their overarching mission is to establish and uphold safe working environments for all manufacturing employees, while simultaneously assisting client companies in meeting quality standards and productivity challenges through a preventative approach.
Specializing in a diverse array of fields including Digital Health, Instrumentation, Control Systems, Mechanical Engineering, Biomedical Engineering, Health & Safety, and more, Feraru Dynamics leverages their expertise to develop cutting-edge solutions. One such solution is the HAV-Sentry system, which has been meticulously crafted to deliver real-time alerts based on the vibration perceived by the user's hand. This proactive approach aids in preventing overexposure to harmful vibrations and facilitates the establishment of robust control measures.
Central to their offerings is the Aegis, a textile-embedded sensing and control unit that integrates measurement, alerting, and control systems. Continuously collecting data on vibration, grip strength, and hand orientation, the Aegis provides live exposure alerts and facilitates online visualization, analysis, and reporting. Designed for comfort and practicality, Aegis units come pre-assembled in a breathable, moisture-wicking liner glove that can be easily washed or replaced when necessary.To ensure seamless integration into workplace protocols, each Aegis device is paired with a Bluetooth Low Energy tag storing user and company identification numbers. These tags are individually assigned to operators and utilized for pairing with the Aegis device at the beginning of each shift, enhancing efficiency and ease of use in monitoring staff health and safety.

INOCARDIA	Company website: http://www.inocardia.co.uk/ Contact details: Techno Centre, Puma Way, Coventry CV1 2TT

General description, products and successes:

InoCardia has developed an assay that revolutionizes the screening process for potential adverse effects of drugs on the heart, particularly those in development by pharmaceutical companies. Adverse cardiac effects are a significant cause of attrition in drug Discovery & Development, often leading to costly drug withdrawals. InoCardia's solution addresses this critical issue by providing specialized cardiotoxicity assessment services tailored for Pharma & Biotech customers. Their UK-based expertise encompasses the utilization of Work Loop models, renowned as the gold standard for in vitro inotropy measurement. These models manipulate pre- and after-load conditions while concurrently measuring microscopic forces within heart muscles and myocytes. Analogous to the pressure-volume loop, the Work Loop model serves as a diagnostic tool for identifying abnormalities in contractility and excitation coupling, offering valuable insights into a drug's mechanism of action. Extensively characterized against over 70 cardiotoxic mechanisms and drugs, the Work Loop model stands as a robust and reliable tool in drug evaluation.
Additionally, InoCardia introduces CardioToxome, a groundbreaking approach that enables the early detection of cardiotoxicity without the need for physical samples. Leveraging solely human clinical data, CardioToxome represents an innovative Safety Pharmacology concept that significantly reduces the time and cost associated with assessing new drugs. Remarkably predictive, CardioToxome rivals the combined efficacy of traditional in vitro ion-channel and cardiac safety panels, marking a pivotal advancement in drug safety evaluation.

During the past 4 years InoCardia, has supported efforts of UK government in fighting Covid-19, and won SPS Technology Innovation Award (2020), Women In Innovation Award (2022) and MediLink Midlands 'One-To-Watch' award (2023

5. Efforts at UKG and UOI

Among many centers of University of Kragujevac focusing on excellence of research and education is the Center for Technology Transfer – University of Kragujevac.

	Office website: http://ctt.kg.ac.rs/ Contact details: Liceja Kneževine Srbije 1A, 34000 Kragujevac, Serbia

General description:

At the University of Kragujevac, a commitment to excellence permeates every facet of its organizational structure. By seamlessly integrating the functions of various institutions and units within its framework, the university actively pursues a comprehensive policy aimed at perpetually elevating the standards of education, enriching the realms of research and artistic endeavours, fostering a culture of innovation, and extending unwavering support to students in their academic and professional journeys. This holistic approach underscores the university's dedication to providing a well-rounded and dynamic learning environment.

A significant milestone in this pursuit of excellence occurred in June 2017 with the establishment of the Center for Technology Transfer. Positioned as a pivotal component within the university's ecosystem, the Center is strategically designed to consolidate and enhance the transfer of technology. Its multifaceted objectives include providing robust infrastructure support for the development of innovation, facilitating the application of technological breakthroughs, and safeguarding the intellectual property of the university's academic community.

The Center for Technology Transfer plays a pivotal role in bridging the gap between academic endeavours and practical applications, facilitating a seamless transition of cutting-edge research into tangible market contributions. By doing so, it not only enriches the academic landscape but also contributes significantly to the socio-economic development of the broader community. In essence, the establishment of the Center exemplifies the University of Kragujevac's proactive stance in fostering an environment where knowledge flourishes, innovation thrives, and intellectual property is safeguarded for the benefit of all stakeholders within and beyond its academic realm. The recent addition to the Center will be an Innovation Incubator with an aim to engage and provide support to the student population as well as researchers in their quest for launching innovative solutions.

Δομή Απασχόλησης & Σταδιοδρομίας	Website: Contact details: Employment & Career Centre, University of Ioannina, 45110 Ioannina – Greece, email: dasta@uoi.gr

The University of Ioannina (UOI) recently established its technology transfer office, which will support all activities related to spin-off creation. However, the university is keen on fostering spin-offs and startups, recognizing them as specialized entities crucial for promoting innovation. By facilitating the creation of such ventures, UOI aims to bridge the gap between research outcomes and societal needs, fostering a culture of innovation and entrepreneurship.

To further bolster these efforts, there are plans to enhance the capabilities of the Technology Transfer Office, with a specific emphasis on supporting spin-offs and startups. This strategic approach seeks to facilitate the transfer of knowledge and technology, fostering alignment between scientific endeavours and technological advancements.

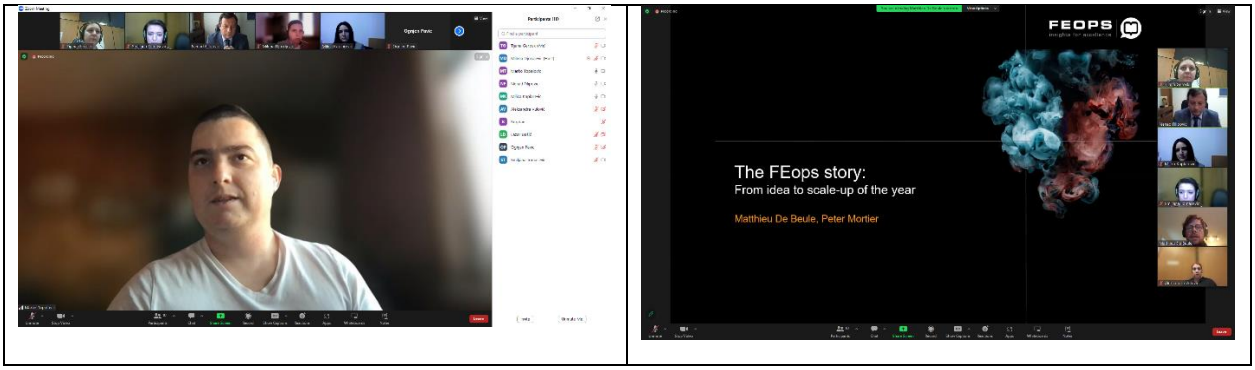
Presently, UOI's Employment & Career Centre (DASTA) plays a pivotal role in providing career services to students and graduates, serving as a liaison between them and the business community. This initiative not only supports students in their professional endeavors but also serves as a potential avenue for nurturing future entrepreneurs and innovators. Through their interconnected offerings, they strive to provide robust support for their educational and professional development, facilitating their transition into the Greek and international labor markets. Additionally, they endeavor to foster an outward orientation for UOI, establishing connections with institutions dedicated to production and development. Furthermore, DASTA is committed to promoting entrepreneurship and innovation among UOI students and graduates, empowering them to explore and pursue entrepreneurial endeavors. Lastly, they play a vital role in providing valuable feedback to UOI’s education structures, offering insights into labor market needs and contributing to the continuous improvement of our educational programs to better align with professional demands.

6. Q&A sessions with spin-off companies

In order for UKG researchers to provide direct insight in and interaction with spin-off companies, online Q&A sessions were organised between UKG researchers and the CEO of the following spin-off companies (which took place on 27 Dec, 2023):

- Dr. Matthieu De Beule, CEO from FEops (https://www.feops.com/), a spin-off company from UGent (Belgium) that specialises in image-based preoperative planning software for cardiac interventions.
- Dr. Marko Topalovic, CEO from ARTIQ (https://www.artiq.eu/), a spin-off company from KU Leuven (Belgium) that specialises in AI-based diagnostics and decision making for the treatment of lung diseases.

Each Q&A session was prepared and attended by 9 UKG members (including prof. Filipovic). CVs of UKG PhD students and postdocs were shared with the CEOs in order to promote future interaction. UKG members could freely and informally ask questions on what it takes to establish and run a successful spin-off company in biomedical engineering and CEOs shared valuable insights on research valorisation. Many relevant aspects were discussed, such as how to raise money for spin-offs, successful stories on promoting solutions to targeted audience and questions about licencing medical software. The fact that the core activities of both companies are associated to medical informatics (AI, data-driven approaches, software and simulation tools) made it particularly rewarding to UKG members.



Snapshots from Q&A sessions with dr. Topalovic (CEO from ARTIQ; left) and dr. De Beule (CEO from FEops; right).

7. Deviation from the work plan

There were no major deviations from the workplan.

8. Conclusions

By showcasing the successful stories and distributing them among early stage researchers, UKG draws valuable inputs from the best in the field and its partners. Several key lessons can be learned and applied to the creation of spin-off/startup/spin-out companies.

First it is necessary to identify market needs. Thorough market research to identify unmet needs and opportunities in areas such as bone health, cancer, cardiovascular disease, tissue engineering, bioinformatics, sensor informatics, imaging informatics, and public health informatics ought to be conducted. Each of the displayed companies shows understanding of the specific challenges and gaps in their respective areas and guide the development of solutions that address real-world problems.

Second, establishment of strategic partnerships is mandatory for success. Collaboration with academic institutions, research centers, hospitals, and industry partners are crucial to leverage expertise, resources, and networks. Building strong partnerships can facilitate access to research funding, validation of technologies, and opportunities for commercialization.

Third, focus on innovation is essential. Innovation must be prioritized by developing novel approaches, technologies, and solutions that offer significant advancements over existing methods. As shown, this could involve leveraging cutting-edge techniques in multiscale modelling, data analytics, machine learning, and artificial intelligence to address complex biomedical challenges.

Fourth, regulatory compliance makes or breaks companies. It is necessary to understand and adhere to regulatory requirements related to biomedical engineering products and services. Compliance with regulatory standards, such as ISO certifications and FDA approvals, as well as other EU and national regulative, is essential for ensuring safety, efficacy, and market acceptance of new technologies.

Fifth, investment in talent pays off. Recruitment and retainment of talented and multidisciplinary team with expertise in engineering, artificial intelligence, medicine, biology, data science, and other relevant fields is crucial, as diverse team with complementary skills and backgrounds can drive innovation, problem-solving, and collaboration within the organization.

Sixth, value-added services are key aspects of businesses operating for a long time. Offering comprehensive solutions that provide value-added services beyond product development, such as training, consulting, and support can enhance customer satisfaction, promote long-term partnerships, and differentiate the company from competitors.

Seventh, some mechanisms for technology transfer from academic research to commercial applications ought to be embraced. As learnt from SGABU partners, this may involve licensing intellectual property, forming spin-off/spin-out/startup companies, or collaborating with technology transfer offices to facilitate the translation of research findings into marketable products and services.

Eight, quality assurance and quality control measures throughout the product development process must be prioritized. Rigorous testing, validation, and quality management systems to ensure the reliability, accuracy, and safety of biomedical engineering solutions ought to be applied.

Lessons learned from successful companies provide general recommendations for spin-off/spin-out/start-up companies in the broader field of biomedical engineering. What can be noted is that each has their unique approach to the research, market, and commercialization, creating distinct identity, mission and approach to business, going beyond state-of the art.