Life Science Open Space 2022

Guidebook

Online & Live
EVENT
NOV 21-24. 2022

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About Life Science Open Space

The Life Science Open Space is an event for scientists, innovators, entrepreneurs, doctors, brokers, investors, and officials – who share a commitment and drive for cooperation in solving problems, facing challenges and developing innovations for the health and quality of life.

... BECAUSE INNOVATIONS ARE INFINITE THANKS TO COOPERATION!

The framework program

The **LSOS program** has been always created by partners and participants – those who share their ideas and needs and those open to collaboration and new opportunities.

Thus, the agenda is filled with Collaboration Offers – ten-minute talks about conditions, assumptions and needs, complemented with Keynotes, Expert Panels, Technology Assessments, Trend Analysis and Opportunities, focused on the collaborative fight against cancer.

Hours	Nov 21st	Nov 22nd	Nov 23rd	Nov 24th
9.00 – 18.00 online	One-To-One-Meetings on the LSOS Platform			
9.00 – 12.00 online	Health Tech (part1)	Food Tech (part 1)	Healthy Environs (part 1)	Career in Life Science
12.30– 15.00 online	Health Tech (part2)	Food Tech (part 2)	Healthy Environs (part 2)	Life Science Business Development
15:30– 18.00 online	Life Science StartUp Scene	Life Science StartUp Scene	Life Science StartUp Scene	
18.00– 22.00 In Person				INSPIRATIONS LIVE AFTERPARTY

CHECK NOW DETAILED AGENDA

[Events Agenda – LSOS Collaboration Platform]

HEALTH TECH – Integrate to accelerate

NOV 21ST - Online

Why not bring together those persons representing various domains and specialities of Medical Technologies to connect with the view to making progress against cancer?

Virtual Reality Simulation for Surgical Training and Pre-operative Planning in Neuro-Oncology

Author: Przemysław Korzeniowski, Sano Centre for Computational Medicine

Abstract: High-fidelity Virtual Reality (VR) Simulators provide a safe, controllable and configurable training environment in which clinicians can repetitively practice their skills. As a result, such simulators contribute to clinical training and improve the educational experience without putting patients at risk, raising ethical concerns, or requiring expensive animal or cadaver facilities.

Whilst their initial cost might seem expensive at first, VR simulators can in fact be cost-effective when considering the wider economic benefits of better-trained surgeons and resource optimisation. Studies show savings on instructor time, error reduction and faster completion times.

Moreover, by combining VR simulation with (semi)-automatic segmentation of medical images of tumours it is possible to achieve patient-specific virtual simulation cases, which can be used for precise pre-operative planning of real surgery. Such planning allows for more precise resection of tumor while minimizing the damage to healthy tissues and critical vessels.

Despite that VR simulation is successfully applied in various surgical specialities, including oncology, there is still enormous potential for further development.

We are looking for clinical collaborators who can help with simulation realism and usability validation studies. In return we offer taking part in projects using state-of-the-art technology as well as co-authorship in related publications.

Machine self-semantic learning of cancer disease: a case study on brain tumour early progression

Author: Dr. Jose Sousa, Sano Centre for Computational Medicine

Abstract: It is anticipated that artificial intelligence (AI) will revolutionise healthcare, as big data provide AI with context data, a foundation of human knowledge. Currently, AI mainly uses deep learning (DL), however, most of the models produced this way emerge from some type of human training. The proposed AI semantic space learning model builds upon the understanding that learning is a process of relating representations of the world to goals. Semantic learning brings together statistical learning and complex networks providing an explicit meta-modelling approach to create a decision-making point. Additionally, it supports flexible complexity for profiling inference and learning. Here we applied this framework to perform a case-study to assess brain tumour (astrocytoma) progression indicators.

First results of the PRIMAGE Project

Author: Leonor Cerdá Alberich, Computing and AI Department, Biomedical Imaging Research Group (GIBI230), La Fe Health Research Institute

Abstract: PRIMAGE is a European project financed by the European Commission composed by 16 European partners and has an implementation duration of 4 years (2019-2022). Internationally recognized researches in in-silico technologies and clinical experts in pediatric cancer are part of the staff of PRIMAGE.

This project proposes an open cloud-based platform to support decision making in the clinical management of two paediatric cancers, Neuroblastoma (NB), the

most frequent solid cancer of early childhood, and the Diffuse Intrinsic Pontine Glioma (DIPG) the leading cause of brain tumour-related death in children.

PRIMAGE platform implements the latest advancement of in-silico imaging biomarkers and modelling of tumour growth towards a personalised diagnosis, prognosis and therapies follow-up. The first results on the development and validation of image-based tools and models based on AI algorithms are available for their final implementation into the platform. This talk will cover the main achievements and lessons learned during the project as well as recommendations for future work in the fields of radiology, medical imaging and AI.

Do cells live the same way in the lab and human body? Why all research should be made from the right beginning

Author: Marcin Krzykawski, Founder and CEO of Real Research

Abstract: We are on the market to limit the cost of drug development and make scientific research more reliable. We are focusing on cell culture as a widely used tool in the field of scientific research. Cell culture has a direct impact in many areas of healthcare research such as drug discovery, cancer research, and regenerative medicine. Since early 1900 all mammalian cells have been cultured on plastics in two dimensions and served to test drugs in the preclinical phase. New drug development is a long and money-consuming process. An entire pathway from discovery and preclinical research to clinical trials takes up to 15 years. Very often when a new drug reaches the final stages of clinical trials it fails due to the different behaviour of the drug in the human body in comparison to laboratory cell lines. Finally, the success rate of clinical trials for new drugs is often lower than 10%. Nowadays new methods are gaining more and more attention – our goal is to show how an innovative approach to cell culture will boost your efforts to solve health problems and improve the quality of life.

We are looking for scientific collaborations with academia. We could cover the expenses of initial research and support generating preliminary data until further funding is obtained

We are also looking for scientific collaborations with CROs and drug developers to help create relevant 3D research models that can be offered to other clients

A medical device on track & on time

Author: Mariusz Mąsior, CEO and CTO at Consonance

Abstract: We trust doctors, and so we trust the devices they use. Don't we? A medical device requires a special design and development approach to make it successful. How not to get sidetracked from primary goals or lose focus especially when time to market is crucial?

If you're thinking about innovating healthcare, this 10-minutes long pitch will guide you through a medical device development process which we at Consonance think can get your idea not only materialized but also achieve notified body approval. Of course, if your idea is technologically possible!

What are the stages of processing medical devices and how to successfully navigate a medtech project including oncology ones?

We are a medical device development company focused on medical device product development for startups, Medtech companies and pharma multinationals. Our services include:

- Medtech product idea generation
- Product Prototyping
- Engineering (electronic & mechanical)
- Manufacturing (small batch)
- Certification Strategy
- Medtech Project Management

Essentials to innovate healthcare!

Harnessing the power of HPC for medical simulations

Author: Piotr Nowakowski, Medical IT Systems Laboratory at ACC Cyfronet AGH , Leader of the Scientific Programmers Team at the Sano Centre for Computational Medicine

Abstract: Conducting research at the cutting edge of medical science often calls for access to large-scale computational and data storage architectures. However, medical researchers typically do not possess the level of technical expertise required to take full advantage of the capabilities offered by such resources. This, in turn, calls for environments and tools which bridge the gap between domain science and the underlying IT infrastructure.

For over 15 years our team has been developing customized IT solutions for medical research projects, with particular focus on the Virtual Physiological Human initiative. Here, we wish to present the Model Execution Environment, an architecture which can be used to quickly and efficiently deploy computational tasks to HPC resources offered by our home institution - ACC Cyfronet AGH. We are looking for partners in the medical field, whose work involves computationally intensive research and would stand to benefit from access to HPC resources.

Enhancing patient health and well-being by streamlining processes in oncology

Author: Anna Gawrońska, Łukasiewicz - Poznański Instytut Technologiczny

Abstract: Despite the huge technical and technological progress, the lives of oncological patients are at risk. This is mainly due to the long waiting time for certain medical services. The lack of effective and efficient tools supporting the

management of the patient flow process is the reason for this phenomenon. The mere implementation of IT solutions is not enough. Actions are needed to rationalize current processes with the use of well-thought-out digital solutions.

Effective and efficient tools supporting the flow of oncological patients can contribute to shortening the response time to the patient's needs in this area. The process analysis, which has been used for years, makes it possible to set process efficiency criteria and design individual activities using digital tools in a way that is safe for the patient and friendly to the medical staff. Thanks to this approach, it is possible to choose the most rational approach, which will contribute to the improvement of the process in the maximum way.

Current projects using neuroimaging

Author: Alessandro Crimi, Sano Center for Computational Medicine

Abstract: Glioma is the most common form of central nervous system (CNS) neoplasm that originates from glial cells. In the United States, there are six cases of gliomas diagnosed per 100,000 people every year. At the current stage there are no significant therapy to treat this type of cancer, and patients suffering of it have a poor prognosis.

There has been enormous advancement based on machine learning for segmenting the tumor in magnetic resonance imaging, and to correlate to genetic information and prognosis. However, this hasn't helped to find a cure, and more advanced neuroimaging approach have also some flaws.

We have several projects running studying how to address those issues related to glioma:

1. We have now developed a more advanced analysis based on brain connectivity focused on diffusion and functional MRI.
2. We have a software able to predict how the brain connectivity (rewiring of the brain) will appear after surgery and brain plasticity for recovery, this might be useful to improve surgical planning leading with less disability of the patient.

3. We have an automated analysis for histological tissue grading the status of the tumor and also the possible response to immuno-therapy, which is currently the frontiers in treatment and hopefully it will end this terrible type of tumor.

Orphan drug designation for cancer medicines – how to make rare cancer drugs more valuable at the early stage of development

Author: Andrzej Siwiec, DBS Law Firm (Dobrzański Bzymek-Waśniewska Sroka-Maleta Kancelaria Radców Prawnych s.c.)

Abstract: About 30 million people living in the European Union (EU) suffer from a rare disease, including rare cancers. Lack of proper therapies in rare diseases is described as one of the most important unmet medical needs in Europe. However, research and development in the area of rare diseases is a high-risk venture for biotechnology companies. In order to support research, development and commercialization of medicinal products in the area of rare diseases, legal framework ensures specific incentives to encourage investments in this area of the pharmaceutical market.

We would like to present the specific legal regulations in the area of orphan medicinal products in the European Union, which may facilitate research and development of medicinal products for rare cancers and make the products more attractive for potential investors or licensees. We will present requirements to obtain orphan drug designation in the European Union, benefits granted for orphan drugs and crucial conditions to maintain the status at the stage of granting marketing authorization.

Endothelial profiling as a novel toolbox in preclinical safety and efficacy studies

Author: Dominik Czaplicki, Jagiellonian Centre for Experimental Therapeutics (JCET, Jagiellonian University)

Abstract: Current approaches to vascular safety of drugs need refinement and improvement - it is increasingly recognized that even small cardiovascular changes may be very relevant to longer-term clinical outcomes. Many drug-induced vascular toxicities are driven by drug-induced endothelial dysfunction. Endothelial cells cover huge inner surfaces of the entire cardiovascular system and their significance spans well beyond the circulation. Therefore, malfunction of the endothelium can result in clinically-important adverse effects.

We offer a panel of preclinical assays, including in vivo Magnetic Resonance Imaging-based method, to evaluate drug-induced effects on endothelial function. Using this toolbox, we can perform predictive preclinical testing of endothelial responses to drugs that can streamline drug development efforts, reduce attrition rates and improve clinical outcomes. Our approach has been recently demonstrated on a family of anticancer therapeutics called tyrosine kinase inhibitors (TKIs).

A GPU-Accelerated Model of Neuroblastoma to Predict Disease Outcome and Find Drug Targets

Author: Kenneth Y. Wertheim, University of Sheffield

Abstract: Neuroblastoma is the most common extra-cranial solid tumour in children; around half of all cases are high-risk and may relapse despite intensive multimodal treatment, whereupon the five-year survival rate drops below 10 % [1]. We developed the first multicellular model of neuroblastoma as a part of the PRIMAGE project [2] and tested hypotheses regarding clonal evolution and therapeutic combinations on hundreds of thousands of cellular agents, simulated on GPUs.

Our model comprises a continuous automaton (CA) representing the microenvironment inside the tumour, autonomous neuroblast and Schwann cell

agents, and a centre-based mechanical model. Cell cycling, apoptosis, and necrosis are the agents' major behaviours, which depend on the CA's inputs and the agents' own attributes. For example, the neuroblasts promote proliferation in Schwann cells. The mechanical model resolves cell-cell overlap. The initial conditions are set to match patient-specific data, including the tumour's histology and mutations (such as MYCN amplification: a strong predictor of adverse outcomes). We devised a calibration pipeline based on Latin hypercube sampling and experimental/clinical observations. As the stochastic model has 20 fitting parameters, we ran the costly simulations within the Flexible Large Scale Agent Modelling Environment for the GPU (FLAMEGPU) [3]. After calibration, we simulated the tumour's evolution over months in 1200 randomly generated conditions defined by the macroscopic properties and clonal composition of the tumour. Macroscopically, we considered the tumour's oxygen level, cellularity, enrichment in Schwann cells, and degree of differentiation. Microscopically, we considered 24 clinically observed clones with unique combinations of mutations. From the 1200 conditions, we selected one favouring tumour progression and simulated the effects of inhibiting selected gene products in the neuroblasts.

With hundreds of thousands of agents in the system, it took around a minute to complete hundreds of one-hour time steps. Calibration took around 40 days. Our results—after exploratory analysis, clustering, and dimensionality reduction—show that the tumour's macroscopic properties predict the disease outcome better than its clonal composition. While a lack of oxygen leads to regression, differentiation into healthy neurons occurs when there are enough Schwann cells. The macroscopic properties promoting progression select the MYCN-amplified clone too. The perturbation studies' results show that the intracellular mechanisms are non-linearly linked: inhibiting a gene product may disrupt DNA repair but oddly prevent apoptosis.

Our results agree with clinical observations of heterogeneous neuroblastoma tumours [4]. Once integrated with the PRIMAGE platform, the model can facilitate patient-specific prediction of disease outcome and unravel the non-inear dynamics of neuroblastoma to find drug targets. The dynamics of up to 10 million cells can be simulated and the successor to FLAMEGPU is constantly being improved on.

References.

1. Morena L et al., European Journal of Cancer 136: 52-68 (2020).
2. Martí-Bonmatí L et al., European Radiology Experimental 4(1): 1-11 (2020).

3. Richmond P et al., Briefings in Bioinformatics 11(3): 334-347 (2010).
4. Berbegall AP et al., British Journal of Cancer 118(11): 1502-1512 (2018).

Acknowledgements.

We thank other PRIMAGE partners and the EU's Horizon 2020 research and innovation programme (grant agreement 826494). PR is grateful for an EPSRC grant (EP/N018869/1).

The PRIMAGE project will come to an end soon. However, I want to further my work by optimising anti-GD2 immunotherapy for neuroblastoma. This treatment is the only kind of immunotherapy approved for neuroblastoma at the moment, so it is worth optimising to improve the survival rate of high-risk neuroblastoma patients. In addition, I am interested in incorporating evolutionary principles into chemotherapy regimens for neuroblastoma treatment. Methodologically, these projects will utilise multiscale modelling, large-scale simulations, bioinformatics analysis, and machine learning. I am looking for sponsors to fund my proposed work. For example, I would like to collaborate with a biomodelling company to conceive and supervise a PhD research project.

More broadly, the Complex Systems Modelling Group at the University of Sheffield have expertise in modelling cancers and simulating their dynamics across multiple scales in space and time. Our FLAMEGPU2 software tool can support the simulation of millions of cells evolving over months of clinical time. We need multimodal patient-specific data to inform and validate these models, so experimental and clinical collaborators are needed.

Making preoperative surgery planning accurate and tangible

Author: Ewa Waliczek, Customy

Abstract: Standard surgical treatment techniques are cost-ineffective, and nearly 1/3 of patients are dissatisfied with the results of such treatment. For each ortho&cmf operation, we can save an average of $3720 using anatomical models and $1488 using surgical guides. Using personalized solutions, in 92% of cases, we will significantly improve the quality of treatment.

Our solution to these problems is Customy Vision software that adapts 3D printing for personalized surgical treatment for every patient. Customy Vision allows easy conversion from CT/MRI scans to 3D printing-ready digital anatomical models for pre-operative surgical planning and designing patient-specific medical devices like implants and surgical guides.

Customy is looking for medical units (Radiology, Orthopedics, CMF) to cooperate in the further development of the Customy Vision software. Feedback from end users is very important to us, which is why we are looking for physicians/scientist who want to use 3D printing techniques and virtual operation planning in their daily work. Our partners can count on free licenses of certified medical software.

Hormones and breast cancer risk - first Polish research in the mobile app

Author: Krzysztof Łukaszuk, iYoni App

Abstract: Does hormone therapy affect breast cancer risk? What is the impact of pregnancy, childbearing, and breastfeeding? Is it safe to use contraception and infertility treatment? Scientists from around the world are trying to answer these questions. Researchers from the Medical University of Gdansk and the Polish League Against Cancer decided to survey Polish women comprehensively for the first time. To reach as widely as possible with the project - they are using the medical fertility application - iYoni.

Breast cancer is the most common cancer in women in Poland and around the world. It is a serious problem that requires extensive education, prevention, and insight into risk factors. It is estimated that the disease will occur at some stage in life in up to one in eight women. The average age of onset is 62, but as many as 20% of all diagnoses are in women before the age of 50. The number of newly diagnosed breast cancers in each age group is increasing every year.

To encourage women to participate in the survey, a user-friendly and convenient form and digital solutions were used. The iYoni mobile app for fertility monitoring and infertility treatment implemented a special questionnaire in the form of a short chat with relevant questions. Those who complete it will receive personalized tips for check-ups and various forms of cancer prevention.

Guidelines for participants were developed by a team of experts in oncology and women's health.

The aim of the study is to verify in detail the correlations between hormone increases and the use of hormone therapies (as a form of contraception, during infertility treatment, during menopause) and breast cancer risk. Researchers want to find out whether the use of hormone preparations is neutral for women's health and possibly dispel popularized myths.

In the first few months, 1,654 women between the ages of 20 and 50 filled out the survey on the iYoni app, with an average age of 27. 41% of the respondents are using or have used hormonal contraception in the past. More than a third of respondents already have children (34%), and more than half (56%) have tried or are trying to have offspring. Nearly 15% of the women who participated had been treated for infertility. Among those surveyed were 54 people diagnosed with breast cancer. On average, the cancer was diagnosed around age 35. Twelve carriers of the BRCA mutation, which is associated with a higher risk of the disease, responded. Genetic testing for cancer predisposition was performed on 105 respondents. 51 women declared that they were taking or had taken hormone replacement therapy (HRT). After answering the questions, users were given comprehensive recommendations for check-ups and preventive health care, as well as information on fertility preservation (for those with a genetic load or disease).

Medical part of iYoni App was created thanks to the Norway Grant.

A large group of young women whose characteristics correspond to the Polish population took part in the survey. To draw comprehensive conclusions, however, more data from middle-aged and older female respondents is needed. The project leaders need help in gathering more data for the survey. They are also searching for partnerships for scientific and medical collaboration. The iYoni App is the first medical app for reproductive health and it is a proven tool for effective data collection and patients monitoring. It may be a valuable support in clinical trials and a part of wider educational campaigns for women's health.

AI & Digitalization in Pathomorphology - the challenges and new trends

Author: Jarosław Kwiecień, CEO, Cancer Center

Abstract: Currently, there are very few pathologists in Poland, so they are overworked, and it is crucial to speed up the workflow. One of the possibilities to improve the diagnostic process is to provide them with algorithms powered by artificial intelligence. However, preparing such algorithms requires a lot of work for pathologists to prepare very detailed data annotations. We aim to apply novel AI techniques which will make it possible to prepare algorithms without doing time-consuming detailed data labelling.

We need help with data collection to prepare better algorithms. To do this, we propose pathologists use our cloud-based platform for storing their samples, together with the built-in functionality of filling standardized reports supplied by ICCR. This will be enough to gather data to prepare algorithms.

The efficient computational frameworks of data assimilation in planning anti-cancer therapy

Author: Witold Dzwinel, AGH University of Science and Technology, Department of Computer Science

Abstract: The pervasive clinical use of computer simulation in planning cancer treatment is still a goal for the future. Mainly, due to the high complexity of the multiscale 3D cancer models what makes inverse computing - related to both the data assimilation, parameters matching, and their optimization - too demanding computationally. Moreover, the scarcity of diagnostic data and the model over-parametrization make the model ill-conditioned, particularly, in the case of planning personal anti-cancer therapy where many treatment scenarios should be simultaneously scrutinized.

Here, we demonstrate how to circumvent these problems by using data assimilation meta-procedures based on robust model ensemble schemes, i.e.,

supermodeling and knowledge distillation. Using other words, we aim to scrutinize to what extent the complex, over-parametrized 3D spatio-temporal PDE model of cancer (here: melanoma) can be assimilated to data by using an ensemble of pre-trained sub-models or much simpler, weakly parametrized surrogate ODEs models. We show how these schemes work in predicting the global behavior of the tumor, i.e., the evolution of its size dynamics, for various treatment scenarios.

Patient-specific implants for mandibular bone reconstruction after tumour removal

Author: Roman Major, Institute of Metallurgy and Materials Science of Polish Academy of Sciences

Abstract: Jawbone resection is the final surgical treatment for ~5500 patients in EU28 with maxillofacial benign and malignant tumours. The resulting large bone defects lead to scarred, mangled facial appearance and the loss of mastication and speaking function, requiring aesthetic and functional reconstruction as basis for physical and physiologic rehabilitation. Although autologous vascularized bone from fibular or iliac-crest autografts is current gold standard, the portion of transplantable bone is limited and subsequent high-dose anti-cancer chemo-/radiotherapy often results in tissue necrosis.

Consequently, our current research focusses on alternative treatment techniques, separating immediate and long-term reconstruction stages: Immediate reconstruction as Stage (i) targets on drug-eluting, polymer-based spacer implants as substitute to transplanted autografts, which enable local high-dose chemo-/radiotherapy with minimal tissue damage and conserve muscle tension over ~6 months (=on-going R&D of project partners). The final reconstruction as Stage (ii) can then be based on novel patient-specifically manufactured maxillofacial implants, again without autografts (=R&D target of the jawIMPLANT project).

The planned neoformation of vascularized bone in such implants within the patient's own body as "bioreactor" is the safest approach in tissue engineering. Compared to the state-of-the-art (autografts, Ti implants), further targeted USPs

of these metal-polymer hybrid implants for the functional (mastication, speaking, etc.) and aesthetical jawbone reconstruction are strongly improved accuracy (dental interocclusion), mechanical strength, antimicrobial protection, low irritation of surrounding tissue and the possibility for CT imaging in oncological re-checks.

In detail, the following innovations and novelties are envisaged by R&D on additive manufacturing (AM) and bioactive materials by the experienced team of successful companies (implant producers and AM specialists: ChM, Lithoz, Haratech, Alphacam) and research partners (biology, medical, material, surface, pharmacology specialists):

1. AM technologies for mechanically durable, patient-specific implants with:
    1. fatigue- and corrosion-resistant metal CORE, achieved by selective laser melting (SLM) of V-free TiAlNb alloys and isostatic pressing (TRL 4→6), providing support for tooth crowns too
    2. a bioresorbable polymer scaffold SHELL with in vivo biodegradation duration of ~12 months for bone neoformation within the biomimetic pore structure (>60% porosity) and 1-4 GPa elastic m odulus (mimicking natural collagen fibres), achieved by fused deposition modelling (FDM) of PLA-PGA polymer blends with defined crystallinity (TRL 4→6)
    3. novel ceramic jaw-joint implants from tough lithography-based Al2O3 ceramics (TRL 4→6)
2. Biomimetic CAD-CAM implant design from CT and dental X-ray images with scalable templates for predominating bone defects. Special focus is laid on durable mounting to healthy jawbone, torsion-stable fit of polymer shell on metal core, distinct pore structure as well as surgical support aids for high accuracy (TRL 4→6)
3. Optimal bioactivity
    1. anti-microbial protection

Advancing radiotherapy by physics and computing

Author: Leszek Grzanka, Institute of Nuclear Physics, Polish Academy of Sciences

Abstract: Radiation therapy of cancer using beams of fast protons (proton therapy) provides a better dose delivery to the tumour and a dramatic reduction in the dose delivered to the healthy tissue, thereby improving treatment outcomes in many cases. The precision of proton therapy makes it a safer treatment with fewer side effects.

Successful proton therapy requires knowledge and optimisation of dose distribution in patient volume.

Currently, the most detailed picture of the interaction of the particle beam with the patient's body can be obtained in computer simulations employing Monte-Carlo particle transport methods.

We aim at exploiting particle transport methods to improve the process of treatment planning in particle therapy. The numerical simulations enable us to estimate the location of potential toxicities and unwanted side effects.

A first in class immunotherapy solution to fight tumor resistance

Author: Lior Carmon, Biopharma IM

Abstract: Our strategy to overcome cancer resistance is to attract fresh, non-suppressed immune cells into the tumors, with vitality that surpasses the immunosuppression. In both healthy and cancer patients there are many types (or clones) of immune cells, called T-cells, that circulate the body, ready to fight of invaders, such as bacteria and viruses.

This strong diversified immunity, exist in each one of us either post infection with the bacteria/virus (natural immunity) or following immunization through vaccine administration (vaccine-induced immunity). These T-cells become highly active upon encounter with specific invaders and rapidly kill the body’s infected cells. In tumours the situation is very different; here the T-cells, if present at all, are highly

suppressed and have lost the capacity to be potent killers of cancer cells. What our technology is doing, is to inject cancer patients with a decoy that mimics viral or bacterial infection and that locates specifically to tumours.

The effect on the immune system is to attract the circulating T-cells that recognize the specific virus or bacteria. These anti-viral/bacterial T-cells then invade the tumour and eradicate cells showing the viral or bacterial signal (antigen). The tumour immunosuppressive effect in the tumour is not strong enough to immobilize these circulating T-cells that are fresh for battle, and their killing spree is over before they can be inhibited by the tumour immunosuppression effect.

The novelty of our proprietary technology is the type of the payload or tag we are using to mark the tumour cells for destruction. We call this tag a “pathogen cloak”, as it coats the cancer cells with pathogen decoys. Briefly, pathogen cloaks have the ability to re-direct a robust T-cell immunity to a pathogen newly towards tumour cells, in every single cancer patient. Moreover, this is a “plug and play” technology with endless combinations based on existing immunity against many different pathogens. In the last 3 years, our team validated the technology both in-vitro and in initial in-vivo studies.

Laser.ai: living literature reviews accelerated by AI

Author: Paweł Kunstman, Evidence Prime sp. z o.o.

Abstract: Laser AI solves the problem of the cost and time of creating systematic reviews and - based on them - healthcare/medical guidelines.

Systematic reviews are in fact Sisyphean reviews! It takes 1-2 years to produce a single systematic review. After two years, almost all reviews are outdated and 23% of reviews will contain conclusions inconsistent with the new medical knowledge.

This means that even state of art medical guidelines, treatment schemas and refundation strategies are based on outdated knowledge! The problem grows each month, because the speed of generation of new knowledge increases quasi-exponentially, and human abilities to process that information grow sub-linear. Our system speeds the process of evidence synthesis, data extraction and recommendation authoring by an order of 2 right now and will speed it up tenfold within next two years, due to highly specialized AI, verified already by US governmental agency NTP, two major European HTA agencies (GBA and IQWIG), universities and corporations.

Laser AI is our product based on an award-winning deep learning model which won the first prize in NIST TAC-SRIE competition in late 2018. The development was sponsored by EU grants and the product just goes to market.

We are looking for partners that would be interested in running pilot literature/systematic review studies in their business from the following healthcare sectors:

- HTA agencies
- Medical device companies
- HTA consulting companies
- Pharma companies
- Governmental agencies
- Publishers
- Research institutes

and all other companies that conduct systematic, HTA and literature reviews and/or participate in development of healthcare recommendations and guidelines

Our aim is to provide our customers and partners with the best tools that will speed up and simplify their work, but also to better understand the decision processes and needs of our target customers.

Food Tech – Solution for cancer patients

NOV 22ND - Online

You are what you eat i.e. tell me what you eat, and I will tell you how healthy you are. What can we, innovators, researchers, entrepreneurs, doctors, or regulators, do to make eating an effective anti-cancer weapon and cure (and still enjoy it)?

ONKO HELP is a protocol based on the DGD diet, which is the backbone of the DGD brand

Author: Agnieszka Pająk, drGRACE

Abstract: A number of principles and a holistic approach to human health are focused on people with the challenge of cancer. However, the genesis of the DGD diet is based on regeneration, reconstruction or prevention of diseases of civilization, which are the prelude to cancer.

The motto of the dr GRACE brand is prevention through a series of cyclical activities based on detox, regeneration and stabilization, the final point of which is a healthy lifestyle.

The uniqueness of the brand is distinguished not only by the micro but also by the macro scale of factors that affect our physical, mental, spiritual and social health.An innovative approach to health is mapping everything that directly determines the overall result.Already in the 90s, Dr Grazyna Pajak pointed out that immunity comes from the gut, which today is called the second brain. What is just beginning to be explored, our brand has been practising for 3 decades. Through a hybrid of many years of experience with innovative capabilities of advanced technologies, we want to launch a ready product ONKO HELP for both

the B2C B2B and B2G sectors. The scalability of the project has no limits because the protocol is transnational and timeless.

Precision nutrition for breast cancer survivors according to molecular tools: lipidomics, nutrigenetics and gut microbiota

Author: Mercedes Caro Burgos, AZTI

Abstract: Cancer survivors have an increased risk of suffering other chronic diseases, such as diabetes and cardiovascular diseases, and risk of recurrence and second malignancies, and healthy and balanced diet can prevent or at least reduce the severity of many of these chronic diseases. However, dietary recommendations are based on observational studies and general dietary guidelines and few intervention studies have been conducted and so, available data is scarce and inconsistent. Advances in biotechnology in recent decades allow large-scale studies covering genomics, proteomics, metabolomics, lipidomics, and the gut microbiota, among others, which allow a better understanding of the relationship between diet and disease. We are conducting a dietary intervention in breast cancer survivors testing a personalized nutrition strategy based on nutrigenetics and lipidomics with promising results in weight and inflammatory markers reduction.

Healthy food, healthy man – fight with cancer begins on microbial level

Author: Magdalena Jopek, Intermag

Abstract: The ongoing increase of people on the Earth directly causes the growing demand for food. In order to prevent the increase of agricultural areas, steps are taken to leverage the effectiveness of the existing agricultural areas by increasing the amounts of fertilizers applied. The growing application of fertilizers causes increased amounts of ingredients to be washed from the soil to groundwater and surface water, which leads to dangerous eutrophication of water bodies. The presence of microorganisms in the rhizosphere, allows plants to use fertilizers more effectively, and as a result, acquire high crops of appropriate quality without the need for the excessive increase of the fertilization level. Microbiological preparations solubilize phosphorus enabling to reduce use of phosphorus fertilizers by at least 20%. In consequence that will lead to a decrease of the amount of cadmium introduced into the environment with phosphorus fertilizers, which is carcinogenic compounds causing prostate and testicular cancer as well as cancers of the circulatory system. Another advantages of microbial preparations is ability to assimilate atmospheric nitrogen, so there is no need to use chemical fertilizers (or in reduced amounts), which contains nitrates and nitrites. They are precursors of nitrosamines, which can be carcinogenic and mutagenic (reports of the WHO - World Health Organization - World Health Organization indicate that nitrites and nitrates can increase the risk of cancer). The microorganisms introduced to the soil also strengthen the natural protective barrier of plants. It reduces the effects of abiotic stress and increases natural resistance to pathogens. It is the safe way for the environment, where there is no need for pesticides use and the obtained crop is safe for the consumer. Food is one of the most important factors in the cancer problem, so it is crucial for paying the highest attention to crop development from the beginning. Intermag is very aware of this issue, that's way it is leading the project, which purpose is to develop the alternative for agrochemicals: ,,New generation of microbiological preparations to improve crop production efficiency while limiting the use of agrochemicals", no. POIR.01.02.00-00-0060/17.

We are more and more aware of threats awaiting for us in food industry. Ecological agriculture is more popular, but still very expensive and not available everywhere. Microbiological products developed by Intermag can take a part in extension of healthy, ecological food market. The same idea for reducing toxic chemistry in agriculture is shared by European Commission with "Green Deal" and especially "Farm to Fork" strategy. We will like to spread the knowledge that common and a nature-friendly approach in agriculture is within our reach. Hopefully, we would like to interest chemical industry in shifting their approach

to biotechnological one. Therefore, chemicals can be use in more efficient way combined with microbes. We offer to share the knowledge and start cooperation to develop new safe products. On the other hand, with those who share the same path, we are open for cooperation on new ideas or to expand already established products based on microorganism.

Functional foods adapted to the needs of cancer patients

Author: Katarzyna Świąder, Warsaw University of Life Sciences, Department of Functional and Organic Food

Abstract: A functional food is a food that, in addition to having an adequate nutritional effect, has a beneficial effect on one or more functions in the body, significantly improving health and well-being and/or reducing the risk of disease. When developing a new functional product, we need to remember who we are designing it for and what needs it is supposed to meet.

In the case of cancer patients, we must remember that they have particular nutritional needs. Oncology patients are the group most at risk of malnutrition, and we should remember that an inadequate nutritional status worsens the efficacy of anticancer treatment, which may result in a higher incidence of adverse effects, prolonged recovery time, reduced quality of life, increased incidence of infections, impaired wound healing and, in the long term, increased likelihood of death.

Oncology patients at risk of malnutrition should follow nutritional recommendations that take into account their needs. The application of the principles of good nutrition in this patient group can be supported by the development of dedicated recipes and ready-to-use functional products to meet their needs.

What is the role of dietary recommendations in contemporary medicine? Food and cancer

Author: Miłosz Badura, Okręgowa Izba Lekarska w Krakowie

Abstract: In theory, dietary recommendations in medicine are considered equally important as other types of recommendations, but is that an accurate statement? Theory versus practice. Discussion about the links between eating habits and cancer.

Functional food and biopreparates in oncological prevention and therapy

Author: Tadeusz Trziszka - Wrocław University of Environmental and Life Sciences

Abstract: The study presents the current problems related to civilization diseases, especially cancer, and the possibility of reducing the negative effects of oncotherapy by using appropriate preparations of natural origin, including proposals for the use of functional food. The key therapeutic factor is the search for bioactive substances that allow for endothelial regeneration

Prevention of cancer by lifestyle changes: the central role of our epigenome(s)

Author: Carsten Carlberg - Institute of Animal Reproduction and Food Research, Polish Academy of Sciences

Abstract: This abstract starts with bad news: one in two of us will face during our lifespan the diagnosis of cancer, i.e., the detection of a malignant tumor. However, the good news are that less than half of all cancer patients die from the disease and that every second cancer death is preventable. Cancer is typically considered as a disease of our genome caused by the accumulation of DNA point mutations as well as translocations, deletions and amplifications of larger

genomic regions. However, tumorigenesis also comes along with abnormalities in cellular identity, different responsiveness to internal and external stimuli and major changes in the transcriptome, all of which are based on changes of our epigenome. In fact, most types of cancer carry mutations both in the genome and epigenome. Tumorigenesis is dependent on multiple environmental influences, including the surveillance of the immune system for cancer cells. Many pro- and anti-cancer effects of the environment we have under control by lifestyle decisions, such as retaining from smoking, selecting healthy food and being physically active. Thus, cancer preventive interventions are the most effective way to fight against cancer.

Checking the boxes for health tech start-ups: legal landscape before the take-off

Author: Agnieszka Majka, NGL Legal

Abstract: The digital health industry has been growing significantly in the recent years. The rapid pace of innovation in medical devices brings along significant legal, regulatory and policy challenges. Both in the EU and in the national framework, a single legislation covering digital health is still missing, which results in a patchwork of regulations that can apply. At the outset, before the idea is developed, a number of important questions related to regulatory challenges should be asked to avoid pitfalls at the later stage of product development, including integration with the national healthcare system and potential liability exposure. In order for the digital health technology that involves the AI and operates on the patient data to be a reliable technology, further requirements must be met.

Where to start and how to find your way through if you'd like to set off with an innovation in digital health and medical devices sector? How to keep up with the existing regulatory framework, while developing new technologies in the healthcare sector?

In view of the ongoing legal changes, windmills and walls for new technologies in healthcare sector will be discussed.

The Products & Health (P&H) team is a dedicated life sciences practice at NGL Legal. We have a deep understanding of the healthcare and life sciences

business and provide efficient legal assistance in all matters and challenges that the companies face on their route to success in this specific industry sector.

At NGL, we provide all-inclusive advice to:
• manufacturers of medicinal products, medical devices, veterinary, cosmetics, food and food supplements,
• firms that deliver solutions and services to those stakeholders, i.e. distributors, manufacturers of machines, providers of chemicals, software houses,
• the healthcare organisations.

Throughout a clinical trial, we stand by the sponsors, the CROs or the institutions. Whilst hardly any post-pandemic product or service can exist without technology, we also work with digital and mobile health providers and traditional businesses oriented on the digital transformation. In addition, our Cannabis Law Team – the first powerhouse for the cannabis industry on the Polish market – advises domestic start-ups and foreign investors.

The P&H team's primary focus is regulatory and compliance throughout the product's whole life cycle. Product safety and product liability is also their core expertise.

In addition, NGL Legal offers full-spectrum legal services for the LS industry:
• corporate and financing
• commercial
• IP rights
• public tenders
• competition
• employment
• dispute resolution
• tax

OnTraq, a dedicated business environment for start-ups and scale-ups at NGL, brings companies to life, from the concept to success. We help start-ups & scale-ups develop their ideas and guide them through formalities that they should have outsourced. Everything is under one roof of the NGL Group. In Poland and in the entire region of Central and Eastern Europe.

Biofortification of crops with iodine and selenium as a way to prevent cancer

Author: Marlena Grzanka, INTERMAG Sp. z o.o.

Abstract: Iodine (I) and selenium (Se) are essential elements for the proper functioning of the human body and livestock animals. These elements are responsible for the proper functioning of the thyroid gland and the synthesis of its hormones, as well as reduce the risk of colon, prostate and stomach cancer. The last two decades have provided a lot of research on agrotechnical methods of enriching crops with iodine as an alternative to iodized salt. Foliar application of JOSEK iodine - selenium preparation significantly increased the content of iodine and selenium in useful edibe parts of plants, increasing their health-promoting value. Although iodine and selenium are not essential elements for plants, in appropriate low doses they stimulate plant development and have a protective effect in the case of the impact of stress factors on plants. Is the health-promoting effect of crops sprayed with JOSEK a key to the success of this preparation? Is the awareness of producers and consumers in this regard sufficient?

Spread the idea of solving the problem of malnutrition and micronutrient deficiency in the human diet. How can we convince producers and consumers? Benefits for producers who will increase the value of their products (fruit, vegetables) and the willingness of consumers to choose healthy vegetables rather than dietary supplements from the pharmacy. What about supplements for livestock animals is it another market for JOSEK?

The risk of cancer caused by unsafe food. An overview of the latest Rasff data and from global food fraud monitoring system Probase360

Author: Janusz Olejnik, FoodFakty

Abstract: Food in the entire production and distribution chain are exposed to the risk of unacceptable residues of permitted substances, but also cross-contamination or unauthorized use of for example plant protection products, dyes or other additives. Additional risks for consumers arise from the presence

of adulterated foods on the market, often from illegal production chain that is not controlled at all. The lecture aims to present current data for 2021 and 2022 from the European RASFF system and global monitoring conducted by the FoodFakty team and collected in the Probase360 database.

Our goal is to provide innovative solutions to increase the effectiveness of decision processes in food industry. We constantly expand our knowledge of the risk and compliance areas of food market in Poland and around the world by applying horizon scanning methodology and advanced analytical approach during data management . Foodfakty is specializing around 3 main areas: legislation, safety risks, fraud risk. In each area we deliver ready to use management information packages both as a on-line access to data bases and tools or synthesis based on different formats of reports. Content and forms of delivered services are specifically adjusted to GFSI requirements and effectively supports management and maintenance of implemented quality systems

We invite to cooperate every food, food ingredients or packaging producer and distributor on the market in Poland and internationally.

We also invite experts to join our training initiative FoodFakty Academy of Managerial Skills to add value to our projects as a trainer or realized own programs.

Antioxidant properties of friut and green part of different varieties of strawberry

Author: Celestina Adebimpe Ojo, Kinga Dziadek, Aneta Kopeć, Department of Human Nutrition and Dietetics, Faculty of Food Technology, the University of Agriculture in Krakow

Abstract: The use of vegetables and fruits in the treatment and prevention of different chronic diseases, like cancer, based on their interesting antioxidant or anthocyanin properties, is increasing. Anthocyanins are present in fruit and their other parts, they are harmless, easily dissolved in aqueous media, and therefore suitable natural water-soluble colorants. This study has performed the determination of the antioxidant activity of strawberry fruits and their other parts (leaves and petioles). Six varieties of strawberry were analyzed namely

Honeoye, Sengana, Florence, Elegance, Grande Rosa, and Malwina. The samples were obtained from a commercial farm located in the north-northwest part of Małopolska Poland. The plant samples were subjected to cleaning, washing, and freeze-drying ground and then analyzed to determine the antioxidant properties, the data obtained were subjected to mean and analysis of variance. Significant differences were made using the Duncan test ($p \leq 0.05$). The significantly highest concentration of total polyphenolic compounds was measured in the green plants of all the samples for both years in comparison to the fruit part of the samples. The highest antioxidant activity, measured with ABTS and DPPH methods was found in the fruit part of the samples for both years in comparison to the green part of the samples. The results of the analysis of variance indicated that there is a significantly different among the sample varieties with 0.000**at $p \leq 0.05$. Based on the result of the study, both the fruit and green part of strawberries is a potential source of natural antioxidant components as it showed the high antioxidant content in both areas assessed and contains pharmaceutically and medicinally valuable compounds.

Healthy Environs – Avoidable causes of cancer

NOV 23RD - Online

We aim to avoid living in an environment we have been deliberately creating.

Are there innovative options in technology, products and services to avoid “environmental cancer”, e.g. related to ambient air pollution, indoor air, water, radiation or waste management?

Molecular mechanisms of cell damage by environmental factors

Author: Anna M. Czarnecka, Department of Soft Tissue/Bone Sarcoma and Melanoma, Maria Sklodowska-Curie National Research Institute of Oncology

Abstract: Environmental stress such as genotoxic agents can cause DNA damage either indirectly through the generation of reactive oxygen species or directly by interactions with the DNA molecule. Radiation is an environmental mutagen that may cause direct changes in a cell's DNA. In particular ionizing radiation like X-rays break DNA in many loci, leading to chromosome rearrangements. At the same time lower-energy radiation, like UV rays, also penetrate cellular and nuclear membranes and induce DNA damage in skin cells. Moreover particles that derive from the combustion of fossil fuels also promote cancerous changes in airway cells including increased risk of NSCLC with EGFR mutations. Moreover p-Benzosemiquinone appears to be a major causative factor of cigarette smoke-induced oxidative protein damage in lung cells.

How does smog affect our health?

Author: Jakub Jędrak, Polski Alarm Smogowy

Abstract: What is smog? What harmful substances can we find in the air we breathe? Why do we confuse the problem of air pollution with the subject of climate change, with global warming? How does polluted air affect our health? Is the impact limited to the respiratory system? Does smog shorten our lives, and if so, by how much? How many people die each year in Poland just because they breathe dirty air? How does the air quality in Poland compare to other places in the world, in particular to other countries in Europe? Finally, how has air quality changed in our country over the past two decades? During my speech, I will try to answer these and other questions related to the problem of air pollution.

Lifestyle and environmental cancer risk

Author: Anna Małgorzata Czarnecka, Paweł Koczkodaj, Maria Sklodowska-Curie National Research Institute of Oncology

Abstract: It has been investigated that one cigarette contains about 7 000 chemical substances, compounds and elements, wherein more than 70 are strong carcinogens classified by the International Agency for Research on Cancer (IARC) as “carcinogenic to humans”. Despite common knowledge on severe health effects of tobacco use, as many as 1.3 billion people worldwide use tobacco products. In the European Union (EU) smoking is the first cause of premature deaths, despite favorable changes in smoking prevalence. The number of smokers in the EU is still high – 26% of the adult population and 29% of young Europeans aged 15-24 are current smokers. Similarly, in Poland the overall percentage of adult daily smokers is equal to 26%. Moreover, in Poland since 2004, lung cancer has become the first cause of cancer deaths also in women even though breast cancer is the most frequent one.

AI & Digitalization in Pathomorphology - the challenges and new trends

Author: Piotr Krajewski, Jarosław Kwiecień - Cancer Center

Abstract: In the recent years, AI has achieved an enormous growth of quality and possible applications in real life. The team of CancerCenter.ai will present the challanges of using it in digital pathology diagnostics and how we can deal with them to provide a robust and useful digital assistant for a pathologist.

Challenges related to maintaining the health safety of tap water

Author: Klara Ramm, Polish Waterworks Chamber of Commerce

Abstract: Environmental pollution affects the quality of raw water taken for human consumption. Water supply companies are constantly faced with new quality requirements. Monitoring water resources related to persistent, mobile, and toxic micropollutants such as PFAS, microplastics, biocides, endocrine disruptor compounds, etc is necessary. Creating barriers in the treatment system prevents these substances from entering the drinking water. The management of treatment technology must therefore be based on risk management. It is necessary to develop procedures to help small entities (small cities, simple systems, lack of competence) control the source and manage the technology.

Water utilities do not have sufficient knowledge of the medical aspects of the impact of micropollutants on human health. The development of risk management procedures should be based on cooperation with medical experts. As an industry organization, we want to partner with toxicologists and other professionals to help us prioritize health risks related to water.

Bio-based surfactants for the organic pollutants bioredediation in soi

Author: Dariusz Włóka, GreenBack sp. z o.o.

Abstract: The current state of knowledge in the field of in-situ bioremediation technology is in most cases limited to the use of biological methods. This means that it is strongly dependent on environmental conditions such as humidity, temperature or even pH. In practice, this makes the use of green methods to remove pollutants in highly contaminated environments very difficult. Therefore, the development of new products and technologies that allow to simultaneously reduce the negative impact of the environment and increase the efficiency of the bioremediation process is very desirable.

Our recent goal is to introduce into the market new bio-based surfactants that can be easily used for in-situ bioremediation methods. The general idea is to optimize the product in way that will ensure increased biodegradation of organic pollutants but not wash them into deeper layers of soil. The applicability of this type of solution can be extended into other technology sectors such as bio-based synthesis, bio-gas production, and more. Therefore we are open to collaboration.

Ajuga reptans root extract – new, plant derived biologically active cosmetic raw material

Author: Anna Dziki, Politechnika Krakowska im. Tadeusza Kościuszki

Abstract: Lifestyle in big cities poses more and more challenges to our health and skin care, which is exposed to increasing levels of air and water pollution, as well as blue radiation generated by monitors. Degeneration of the protein structures of the skin and oxidative stress result in the premature appearance of wrinkles and skin discolorations. As part of the TRL4.0 project, in the Faculty of Chemical Engineering and Technology of the Cracow University of Technology, we have developed a series of specialized preparations for facial skin cleansing and care, effectively protecting it against toxins and harmful radiation. This series includes a mild cleansing gel, moisturizing and nourishing emulsions and a rich serum that can also be used for the eyes area. The preparations contain a patented ingredient obtained from the root of the creeping bugle. In vitro tests

and application tests with their participation have shown that they provide a 10% reduction in skin discoloration, a 7% reduction in the depth of wrinkles, an increase in skin hydration by 14% and an increase in skin elasticity by as much as 7%. Importantly, the patented substance is a novelty on the cosmetics market, and the proven effectiveness distinguishes this series of preparations from the available anti-pollution products.

The subject of the offer is the right to manufacture and sell the four innovative antipollution products. The designed formulations are protected by patent applications and were tested to prove their effectiveness. The conducted in vitro tests and application tests with the use of developed cosmetic formulas have shown that the protective and caring effect is reflected in a clear improvement in the condition of the skin. Proven effectiveness distinguishes this series of preparations from the available anti-pollution products. It is also worth mentioning that the formulation compositions of the cosmetic products have been carefully refined, taking into account the current trends on the cosmetics market in terms of the simplicity of the compositions and the largest possible share of ingredients of natural origin. Organic butters and vegetable oils, natural emulsifiers and preservatives were used. There are no substances which safety of use is questionable or which are not fully known in terms of long-term impact on the skin. All formulas have undergone dermatological tests and have successfully passed the safety assessment, so they are fully approved for sale on the cosmetics market.

Life Science StartUp Scene – Pitch your idea investors

NOV 21ST-23RD - Online

From early detection to more effective treatments, startups can make a difference in healthcare, including the fight against cancer.

Over three days, the Scene is hacked by industry challenges, new business ventures and needs for entering the market, rescaling activities and financing the development.

Digital Breast Cancer Unit

Author: Paweł Ciesielka, Databion

Abstract:

We are looking for a partner/investor who will support us in gaining international markets

- allows to collect key data on the diagnosis and treatment of patients.
- provides reports and analyzes of parameters in accordance with the guidelines of the SIS accreditation program
- provides multidimensional analyzes of patient, diagnostic data and therapy data
- allows the collection and analysis of the patient's genetic data
- allows to define treatment regimens and supports the process of chemotherapy implementation

Mediprintic - forearm injuries treatment solution

Author: Andrzej Zakręcki, Mediprintic sp. z o.o.

Abstract: The traditional plaster bandage used to immobilise a limb after an injury, regardless of the quality of its manufacture, carries a number of consequences and health complications. To name but a few, these are: impaired hygiene, the weight of the plaster dressing causing overloading of adjacent joints, the inability to adjust the pressure of the dressing after the swelling caused by the injury has subsided, the lack of water resistance and the inability to start early rehabilitation. The problem is also systemic due to under-staffing of doctors and nurses, the lengthy process of setting the injury and applying a plaster dressing. Forearm fractures account for more than 1/6 of all fractures that occur in the human body. The number of forearm injuries in the EU is more than 3 million per year, including 250 000 in Poland. By 2025, the number of people aged 60+ will increase to 1.2 billion on Earth, which means new medical challenges such as osteoporosis (the number of fractures due to osteoporosis in the 5 largest European countries was estimated at 2.7 million with annual treatment costs of €37.5 billion). According to a study, there is a shortage of 68 000 doctors in Poland alone, not to mention other health professions such as physiotherapists and nurses. The problem is not only about injuries, according to the WHO, the second most common cause of all deaths worldwide is strokes. Of stroke survivors, as many as 40 per cent develop spasticity, i.e. excessive muscle tension leading to limb deformity and consequent disability. What is more, a spastic hand tends to revert the contracture to the state it was in before the rehabilitation exercises.

The Mediprintic brace, thanks to its design, provides adequate stabilisation of the forearm with the possibility of adjusting the pressure on the hand surface to maintain a constant level of immobilisation of the limb. The brace allows for the implementation of an early rehabilitation system, i.e. the patient can start exercising much sooner than in a traditional plaster bandage, which shortens the recovery time and is in compliance with current medical knowledge and rehabilitation guidelines for patients after injuries. In addition, the Mediprintic orthosis is completely waterproof, which means that it is possible to start physical therapy procedures even during immobilisation. We also provide active prophylaxis of the spastic hand. The brace protects the hand from clenching and effectively supports the effects of the rehabilitation carried out. It prevents the effects of spasticity and muscle contracture, increases the efficiency and

effectiveness of hand rehabilitation, protects against finger deformities and wrist flexion.

The subscription-delivered orthosis will change the approach to product use because we will finally use it as much as we need to. In addition, through the use of telemedicine solutions and sensors, we will speed up recovery and provide a sense of security in the form of its monitoring and increase self-awareness of good treatment. Introducing the product in this form will speed up the patient's service and provide access to devices right away. The whole world is moving towards subscriptions in every area of life.

Patent applications have been filed for Mediprintic's solutions at the European and Polish patent offices, and trademark protection has also been applied for.

MoodMon: AI based system supporting PATIENTS with AFFECTIVE DISORDERS, their doctors and families

Author: Malgorzata Sochacka, Britenet-Med

Abstract: Scarcity of psychiatric help and lack of objective diagnostic and monitoring tools results in low effectiveness of the therapy. Monitoring is based on patient self-observation and his environment detecting prodromal (predictive) symptoms ; inaccurate and subjective, hence unreliable. MoodMon is and AI based system predicting changes in mental state of patients via analysis of behavioral markers (activity, sleep, voice etc.). It is targeted at three groups: 1. patients, who prefer passive monitoring over self-observation, 2. patients' families, who lack monitoring tools, 3. doctors and therapists, who lack objective indicators of patient's state.

Currently the system is undergoing clinical trial with 100 patients.
Initial implementation was possible thanks to EU funding and mother company involvement.

We are looking for funding to certify the system as a medical device and eventually to expand applicability to other areas of psychiatry.

We are also looking for partners in following areas: 1. commercialization in medical environment, 2. cooperation in producing wearable(s) adjusted to specific needs of our solution.

CliniNote - data-driven medicine enabled

Author: Rafał Szmuc, CEO & Co-founder of CliniNote

Abstract: AI, ML, precision & targeted medicine struggle because most of the clinical data, essential to develop new therapies or train AI, are collected unstructured and remain in the so-called "dark data" area.

CliniNote is a flexible, easy-to-install data capture solution that creates structured data from medical notes on - line, while the doctor is creating the note itself.

CliniNote provides solutions for hospitals, big pharma, clinical trials and physicians. CliniNote is a global solution, language, and geography agnostic.

CliniNote is seeking for investors seed round to scale-up the implementations and presence in Europe, make a footprint in US. CliniNote is heading to to rise the number of software users - hospitals, CRO and pharma are welcome to exploit the CliniNote solution!

Noah Therapies - A Navigation System for cancer patients

Author: Dr. Kai Berner, Noah Therapies GmbH

Abstract: Cancer has become curable - that is a fact. Because oncology has become extremely precise. Oncologic patient journeys today are highly individual, involving 10 years of therapy, 5+ different medical specialists and over 20.000 potential individual patient journeys. The system has become too complex to manage and oversee. For doctor’s, patients and for researchers.

Today the typical time to develop a drug is 8 years. In oncology it's 12 years. Clinical Trials are becoming longer and more costly (30.1 Mio on average per trial), especially in oncology because the specialization in Precision Medicine is leading to smaller, harder to find patient pools and complex trial protocols that cause friction in data collection and additional administrative burden in clinics.

Whether we want to or not, today's fragmented, specialized medical system is already putting the management responsibility on the patient. We are the first app-based navigation system that empowers patients to navigate through the maze of patient journeys (applicable for cancer and chronic disease) that precision medicine has generated. With To Do Lists, Appointment Reminders, Medical Education, Understandable Therapy Plans and the possibility to track mood and symptoms (Phase Two).
This solution can be used to accompany real-world therapies and trials and therefore can be used along the whole journey, and not just one kind of therapy. This is possible because we use a modular, algorithm-based backend. It initially works as a patient-only app and we will add on a clinician feature as soon as we are CE-ready.

In our App, digital patient journey navigation and qualitative data collection are two sides of the same coin. By putting the patient in the driver's seat, we accelerate the medical research of tomorrow.
What we offer for R&D companies:

- digital trial protocols to accompany trials
- integratable eConsent and ePRoms
- patient eligibility matching for clinical trials
- RWD data insights

PregnaLIFE24 - telemedicine system for fetal well-being monitoring

Author: Leszek Wójcik, CEO of Mofema

Abstract: The PregnaLIFE24 system is the eCTG telemedicine solution to conduct fetal heart function tests lasting many hours in the third trimester of pregnancy, which can be used both at home and in outpatient and clinical settings. The PregnaLIFE24 system uses the technology of passive reading of bioelectric potentials. It does not emit ultrasounds to the inside of a woman's body, unlike the conventional CTG devices currently available on the market. Thanks to this, the examination is non-invasive and safe. The potential risk of mechanical damage to the cells based on the phenomenon of cavitation is eliminated. Consequently, this enables unlimited time of fetal monitoring, beyond the typically recommended 30 minutes in the currently used CTG dvices. Long-term examination allows the clinicians to make a better diagnosis. The system is dedicated to telemedicine platforms. The woman can perform the examination herself at home, which reduces the costs of the examination. The test is not complicated.

Mofema is looking for both financial investors and strategic investors. The company is looking to invest funds in certification process in EU and USA, clinical trials, implementations test and commercialization process.

Robotic ultrasound imaging for remote populations

Author: Philippe HOMSI, ADECHOTECH

Abstract: Many remote communities face barriers when trying to access healthcare. The system delivers diagnostic ultrasound processes in real time to remote populations that need ultrasonography.

- Saves travel time and transportation costs
- Identifies health deterioration early
- Improves patient's journey and health outcome

The system aims at :

    - Hospitals that provide tele-health services to remote/ rural populations

- Tele-radiology companies that provide diagnostic ultrasound imaging expertise to remote clinics that lack medical resources
- Correctional facilities to avoid extraction of inmates for ultarsound procedures
- Nursing homes

Development of targeted cancer treatments

Author: Mariusz Olejniczak, CEO of WPD Pharmaceuticals Sp. z o. o.

Abstract: Approximately 10 million people die from cancer each year worldwide. Market data indicate that this number will rise to more than 16 million by 2040. Polish company WPD Pharmaceuticals Sp. z o. o. research and development activity focus on discovering highly selective and targeted therapies in the areas of brain tumors, particularly glioblastoma, which are highly resistant to all known therapies as well as AML (acute myeloid leukemia). WPD has secured exclusive rights (worldwide or for specific territories) for several novel anticancer drug candidates, including biological molecules, in either advanced preclinical or clinical stage development. The most advanced project is Berubcin, which is currently in clinical trials phase.

Polish company WPD Pharmaceuticals Sp. z o. o. is looking for both, financial and strategic investors. The company wants to obtain funds for preclinical and clinical developments on several oncology projects. WPD Pharmaceuticals Sp. z o. o. business model differs significantly from that of other Polish biotech companies. WPD Pharmaceuticals focuses particularly on pre-clinical and clinical development, rather than discovery of new molecules. WPD Pharmaceuticals Sp. z o. o. is looking for the partners to develop new molecules and can conduct scientific consulting, followed by preclinical research and CMC (API, drug product) development so that a given project is prepared to begin clinical trials. The services provided by WPD Pharmaceuticals sp. z o. o. are essential to effectively conduct the early stages of clinical trials, which can be followed by commercialization of projects.

A scaffold product with embedded cells based on 3D bioprinting technology - for use in corneal reconstruction

Author: Acellmed Sp. z o.o.

Abstract: Corneal diseases are noted more and more frequently; over 10 million people worldwide suffer from them. The most common treatments available are donor corneal implantation. However, the problem, in this case, is the limited number of donors, the frequent use of vision correction procedures that prevent corneal transplants, and the increased risk of disease transmission. In Poland, about 900 corneal transplants per year have been carried out for several years. The number of transplants per 100,000 inhabitants of Poland in 2013 was 2.7. For comparison with other European countries: in recent years in Great Britain it was around 4.0, in the Czech Republic 5.0, and in Spain 6.0. The 2018 „Świat lekarza 3D" in the article "Modern techniques of corneal transplantation" states that in Poland around 7011 are expected for corneal transplantation, and about 1000 corneas are transplanted annually from deceased donors. Due to the ageing of the population, this demand will increase.

Pikralida - drug development company

Author: Joanna Lipner, Pikralida sp. z o.o.

Abstract: Pikralida is a biopharmaceutical start-up developing medicinal products to address unmet medical needs while providing the highest efficacy and safety in pharmacotherapy.

Our currently implemented projects include therapeutic solutions based on innovative small-molecule substances, innovative combination preparations/drug formulations, and modern drug delivery systems. The needs of patients suffering from civilisation and neurological diseases and those from the geriatric population are the primary focus in our work.

The mission of Pikralida is to create and maintain an attractive portfolio of projects to license or sell to pharmaceutical companies for further development and introduction to global markets in the future.

Based on the current knowledge and our Team's many years of experience in organic synthesis, pharmaceutical analysis, design and development of pharmaceutical formulations, as well as pre-clinical and clinical research, we implement projects from the stage of coming up with an innovative therapeutic solution concept all the way to that of its clinical verification (proof-of-concept or bioequivalence clinical trials). As part of our activity, we implement projects based on our ideas, purchased licences as well as the requirements of our business partners. At our disposal, we have an extensive network of international experts and academic bodies, both Polish and foreign, with whom we proactively collaborate in research and development.

Drawing on the unique expertise and experience of its scientific team, Pikralida offers professional R&D services in a CRO (Contract Research Organization) model in the scope of drug discovery and development, which include chemical synthesis, the development of formulations, and pharmaceutical analysis.

On an ongoing basis, we monitor technology trends to evaluate new products and technologies, and we are in dialogue with clinicians and patient groups to understand their needs to the greatest extent possible. We implement all projects following current knowledge and regulatory requirements, to meet the highest standard of research.

We are currently actively looking for investors for the first investment round (capital financing of up to EUR 2.0 million). We are also looking for partners from both academia and industry interested in entering in a research collaboration.

Evidence Prime: AI for healthcare literature reviews and recommendations

Author: Paweł Kunstman, Evidence Prime sp. z o.o.

Abstract: Evidence Prime is a Polish-Canadian startup/grow-up providing SaaS software for healthcare organizations worldwide to find, review and assess the evidence (e.g. clinical trial results, systematic reviews, publications, reports etc.) and finally - create living, semi-automatically updating recommendations.

We have over 100.000 users worldwide and tens of enterprise customers including WHO, US government, EU, ministries of health, medical associations, pharma companies, insurance companies, major HTA agencies etc.

We own patents and publications, and in the last year we received US government security certification - FedRAMP and in Poland we acquired a R&D center (Centrum Badawczo-Rozwojowe) status.

We grew to 25+ people with a seed investment round only.

Now, we are looking into options for Series A funding, which we plan to utilize for accelerated growth, to become a market leader in the domain of AI-driven healthcare knowledge acquisition and processing.

We are looking for:

- Potential investors
- Partners in business and in EU grant programs

Business Development – Managing the fight against cancer

NOV 24TH - Online

What role plays the innovative ecosystem and business mind when facing challenges of focusing the business model and strategy on a disease like cancer?

How to overcome bottle necks in development of biotech business?

Author: Magdalena Kulczycka, CE BioForum

Abstract: What do you need to develope your biotech company in highly demanding biomedical enviroment topic wise, regulatory wise or financialy wise? How crucial it is to take into consideration the qualifications of experts leading such project and whom you would need in order to bring bio-product to the market?

We will talk about possible challenges and how to overcome them with panellists representing different perspectives: financial, manufacturing and scientific.

EU grants - financing new methods of cancer treatment

Author: Klaudia Parysz, A1 Europe

Abstract: There are many opportunities to obtain comprehensive funding for projects related to the development of technologies and products that contribute to the fight against civilization diseases such as cancer. Types of projects, sources of potential funding, topics of potential research and case studies will be briefly discussed. We will also present tips on how to effectively prepare your organization for the grant application process.

A1 Europe has been providing services in obtaining E.U. grants for a wide variety of investment projects since 2003. We specialize in understanding our client's needs and providing them with the necessary level of support throughout the whole investment period by providing professional and consistent care through our base of experienced consultants, thus ensuring the most effective strategy in obtaining any given grant.

Our mission is not only selective outsourcing, but also fulfilling the overall business concept.

Career in LifeScience – In search of talents and development paths

NOV 24TH - Online

If competent staff and intellectual capital are the most important resources we need to win the fight against cancer, why not ask experts about opportunities that would drive careers in health innovations and health care for the next decade?

LSOS Collaboration Platform Guide

LSOS is a new, **open collaboration platform**, managed by the Klaster LifeScience Krakow. It is a tool supporting innovativeness and entrepreneurship in the domain of health and quality of life. Here you will connect to community members, join events and projects, find partners, services and products - all you need to start or grow the innovative business.

The collaboration platform allows you to:

- **CONNECT** with the life science community
- Place your offers and request on **MARKETPLACE**
- Arrange **1-ON-1 MEETINGS**
- Enjoy **LIVE STREAMING** of all online sessions

Below you'll find video guides which explain how to use all the different tools available on the platform.

LSOS Collaboration platform – Knowlage Base

- Registration to the platform - https://www.youtube.com/watch?v=ELQxPODsXhM
- Edit organization profile - https://www.youtube.com/watch?v=17zuTG7rZZE
- Arrange 1:1 meetings - https://www.youtube.com/watch?v=QSbBcsSqwaw
- Chat between users - https://www.youtube.com/watch?v=QSbBcsSqwaw
- Events participation - https://www.youtube.com/watch?v=1kuFi0V2LAc
- 1:1 Networking participation - https://www.youtube.com/watch?v=jEBzi3MW6kY
- Offers database - https://www.youtube.com/watch?v=QIuG7Rdql_w
- Create offers - https://www.youtube.com/watch?v=Dirx-H5irh0
- Offers matching - https://www.youtube.com/watch?v=MosRxndrDK8
- Create requests - https://www.youtube.com/watch?v=9n1_sIp13dU
- Request matching - https://www.youtube.com/watch?v=4dgCDIssclQ

LSOS'22 Partners

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bioforum Central European

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Mineral and Energy Economy Research Institute Polish Academy of Sciences

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COBIN ANGELS

EXECMind Life Science Executive Search

eit Health InnoStars — Co-funded by the European Union

eit Food — Co-funded by the European Union

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Ministry of Economic Development and Technology

MAŁOPOLSKA

PARP Grupa PFR

NCBR National Centre for Research and Development

Business Centre Club

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foodfakty portal

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OSOZ

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