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ABSTRACT BOOK

Revolution Through Convolution

- *combining medtech, biotech and digital health to promote health science in our region*

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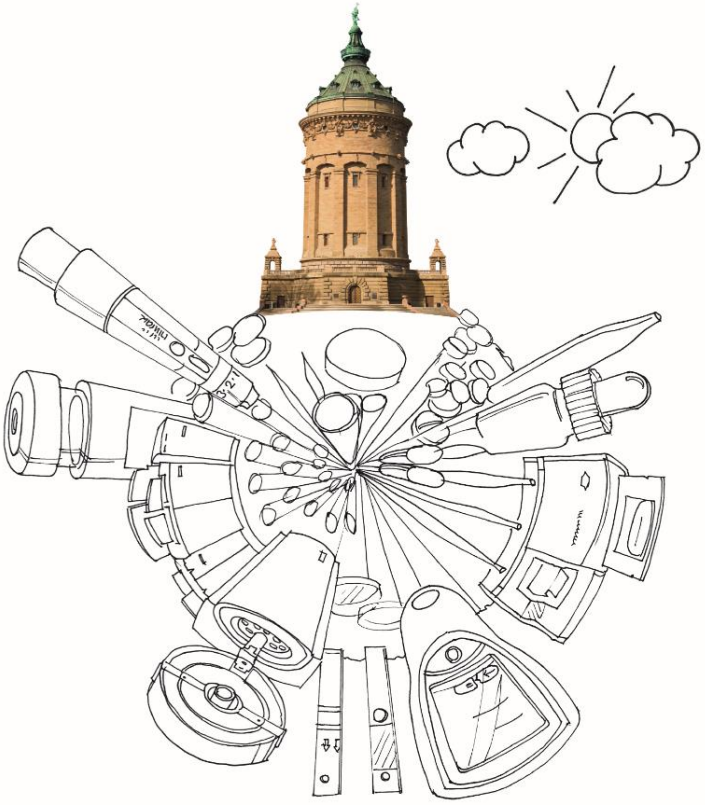

We are at home in Mannheim. We feel at home in the world.

Roche in Mannheim is a high-tech location. Involved in research, development, production, logistics and sales, the Mannheim site is an integral part of the entire value-added chain and helps to ensure that diagnostics and pharmaceuticals from Roche reach patients around the world.

Roche

Welcome

Dr. Friedrich Richter
Managing Director
BioRN Cluster Management GmbH

Prof. Dr. Stefan Meuer
Chairman
BioRN Network e.V.

Dear members, guests and friends of the BioRN network,

Welcome to our BioRN Annual Conference 2017!

We are pleased to have you with us and are looking forward to an exciting and inspiring day here at the **Hochschule Mannheim** which kindly acts this year as the host for this event.

The theme of our 2017 conference "Revolution through convolution – combining Medtech, Biotech and Digital Health to promote Health Science in our region" reflects the dramatic change where Health Sciences currently is going through. In past decades Pharma/Biotech had its focus on drug molecules, MedTech on Diagnostics and devices and there was only modest overlap and scientific exchange. The term Digital Health did not yet exist. Today we are going through an evolution where more integrated innovative solutions lead to revolutionary advances in diagnosis and therapy, which ultimately provide benefit to the patient.

The BioRN association started more than 20 years ago with the aim to promote Biotechnology/Pharma in our region. This has been a success story and we all think back to the major highlight of winning the "Leading Edge Cluster Competition" of the Federal Ministry of Research which provided very significant federal grants to our region.

However, as a cluster association we have to look beyond grant competitions which always are temporary but have to focus on building sustainability. In our global world and in particular in Health Science it is essential that any network builds alliances to its partners around both geographically as well as scientifically in order to generate maximum value for its members.

Thus, BioRN already some years ago formed the Health Axis Europe as a strategic alliance for collaboration with our partners in Leuven, Maastricht and Copenhagen. Furthermore, we have joined forces with our colleagues in clusters around us e.g. the CI3 cluster in Mainz and the Mannheim MedTech cluster and are looking forward to see the fruits of these joined efforts. One will be the

establishment of the “HAE Partnering Platform” during the next years which will become a major tool to promote collaborations between academic research institutions, SMEs and large health companies.

The program of this year’s BioRN annual conference reflects the evolution of our organization with the intent to have a stronger focus on fostering collaboration between the BioRN members, partners from other clusters and beyond the scientific disciplines. We hope that we have found the right mix of presentations, short talks, pitches and posters which provide you an exciting day of knowledge sharing and scientific exchange as part of our journey to contribute to shaping the future of Health Science in our region.

Enjoy !

The Agenda

from 8:30	**REGISTRATION**	
9:00	**Welcome by BioRN Stefan Meuer & Friedrich Richter** **Welcome to Hochschule Mannheim (Dieter Leonhard)**	
9:10	**Matthias Graf von Kielmansegg (BMBF)**	
9:20	 **Carsten Hopf:** „Introduction of the M²Aind Partnership for Innovation in Health Industry – Multimodal Analytics and Intelligent Sensorics”	**T1**
	Rüdiger Rudolf: „Project M²OGA - Solutions and digitalization in the human organ and tissue analytics”	**T2**
9:50	**Elmar Bourdon (Medtech Cluster Mannheim)** “Medical technology opportunity Rhine-Main-Neckar: The regional response to transformation in technology and healthcare.”	**T3**
	Lluis Quintana (Viscofan BioEngineering) „Viscofan BioEngineering – von der Wursthülle zum Medizinprodukt“	**T4**
10:20	**3 MIN SHORT TALKS** • **Volker Stadler**, PEPperPRINT GmbH (**S1**) • **Ronny Schmidt**, Sciomics GmbH (**S2**) • **Thorsten Röder**, Hochschule Mammheim (**S3**) • **André Domin**, Technology Park Heidelberg (**S4**) • **Goran Martic**, TRON (**S5**) • **Benjamin Steeb**, Springer Campus (**S6**) • **Sven Kuhlendahl**, PROGEN Biotechnik GmbH (**S7**) • **Nadja Pfetzer**, Hummingbirds Diagnostics GmbH (**S8**) • **Brandon Malone**; NEC (**S9**)	

The Agenda

10:50	**COFFEE BREAK / POSTER SESSION**	
11:20	**Gitte Neubauer (Cellzome – a GSK company)** "Enhancing the understanding of disease and drug mechanisms"	**T5**
11:40	**Ruth Herzog (Technology Transfer DKFZ)** „From patents to patients" – 20 years Technology Transfer at the DKFZ	**T6**
12:00	**3 MIN SHORT TALKS** • **Manfred Schmidt**, GeneWerk GmbH (**S10**) • **Stefanie Wolters**, Transferinitiative RLP (**S11**) • **Garrit Jentsch**, BAST GmbH (**S12**) • **Thomas Centner**, io-consultants (**S13**) • **Thomas Prexl**, HD Startup Partners (**S14**) • **Bernd Lecher**, mfd Diagnostics GmbH (**S15**) • **Peter Heger**, Health Research Services GmbH (**S16**) • **Matthias Rädle**, Institute for Process Control and Innovative Energy Conversion (PI), Hochschule Mannheim (**S17**) • **Stefan Jungbluth**, European Vaccine Initiative (EVI) (**S18**) • **Thomas Schirrmann,** YUMAB **(S19)**	
12:30	**LUNCH/ POSTER SESSION**	
13:30	**Wulf Fischer-Knuppertz (BIOCRATES Life Sciences AG)** „Can Metabolomics be NextGen IVD"	**T7**
13:50	**Clemens Suter-Crazzolara (SAP SE)** "Improving Patient Outcomes Through Actionable Data Insights"	**T8**
14:20	**Ci3 Cluster (Cluster for Individualized Immune Intervention)** **Andrée Rothermel (Ci3 Cluster)** "The Cluster for Individualized ImmuneIntervention (Ci3): Development of innovative immunotherapies and beyond"	**T9**
	Kai Gräber (Ci3 Cluster) „PERMIDES - enabling innovation partnerships between biopharma and IT"	**T10**

	Joachim Moecks (bioMcon GmbH) & Vitor Vieira (Inova DE GmbH) "PERMIDES INNOVATION PROJEKT: AutoMax User Interface (AMUI)"	**T11**
14:50	**HAE (Health Axis Europe)** **Julia Schaft (BioRN)** "The Health Axis Europe Partnering Platform" **Nico Stam (Brightland Maastricht Campus)** "Brightlands, world-leading innovations in Health & Materials" **Michael De Blauwe (KU Leuven)** "The Leuven R&D ecosystem – innovation in biotech"	**T12** **T13** **T14**
15:35	**STARTUP PITCHES** • **Phagomed (SU1)** • **Lumobiotics (SU2)** • **300 Microns (SU3)** • **LIME Medical (SU4)**	
16:10	**NETWORKING/POSTER SESSION/HAPPY HOUR**	

Talk Abstracts (T)

T1

Prof. Dr. Carsten Hopf, Institute for Instrumental Analytics and Bioanalytics, Hochschule Mannheim

Title: "Introduction of the M²Aind Partnership for Innovation in Health Industry – Multimodal Analytics and Intelligent Sensorics"

Abstract: The BMBF-and industry-funded (5 M€ + 1.3 M€) M²Aind Partnership for Innovation in Health Industry – Multimodal Analytics and Intelligent Sensorics promotes progress in the health industry by creating answers for unresolved technical problems through three so-called impulse projects. M²Aind is a network between Mannheim University of Applied Sciences and numerous companies of the health sector in the Rhine-Neckar-Main region. Key aspect of the research and work is the interface of biomedical science and information technology. The partnership focuses on production processes as well as digital, biomolecular information and their context. The key feature of the research project is its multidisciplinarity.

Purpose of M²Aind is, by means of linked modular technology platforms, the development of new products and services for the pharmaceutical, chemical, Medtech, Biotech and diagnostics industry. To this end, advanced optical measurement technology and instrumental analytics with a wide field of capabilities are engineered for use in IT-based process and product analysis. Core areas are production processes, drug testing and drug safety, active ingredient research in tumours and the search for sugar substitutes. Innovative and intelligent interactions of the technologies are intended to master the complexity of analysing human organs and tissues as well as data processing for the design of ground-breaking process chains.

The impulse project "**SM²all** – small molecules: production, analysis, safety, effectiveness" focuses on active ingredient research and manufacturing. The project modernizes the complete process chain of pharmaceutical productions. Main objective is by means of innovative combination of automation technologies, online measuring techniques and online analysing techniques the production of active ingredients in a quality-assured process without additional offline-testing as well as testing the role in cell cultures. Moreover, analytical methods for small molecules linked to biopharmaceuticals, i.e. antibody-drug conjugates (ADCs), will be developed. Finally, small molecule drugs and ADCs are tested in 3D cell culture formats.

The impulse project „**M²OGA** – molecular human organoid and tissue analytics: multimodality, digitalisation, 3D imaging, highly integrated applications" will be presented by Prof. Rudolf in a separate talk.

"**M²edTech**: conception and construction of demonstrators for real-time sensors and analytics" covers the constructional expertise of the partnership M²Aind. This includes, for example, spectroscopic methods for production process monitoring, new 3D-measuring and visualisation techniques for tissue analytics or intelligent sensors for high-field MRT.

T2

Prof. Dr. Rüdiger Rudolf, Institut für Molekular- und Zellbiologie, Hochschule Mannheim

Title: "Project M²OGA - Solutions and digitalization in human organoid technology and tissue analytics"

Abstract: Biological tissues are composed of three-dimensional networks of similarly or differently developed cells. The spatial arrangement of many thousands of distinct biomolecules determines not only structure and function of a tissue, but is also instrumental with respect to health and disease. Owing to recent massive technological advancements, pharmaceutical and health industries are now confronted with the feasibility of acquiring all of this biomolecular information in a timely and digital manner. This will lead to an increasing digitalization of work environments and clinics and will challenge business models of pharma and health industries. In this context, M^2OGA aims at: (i) Developing a systematic multimodal and spatially resolved acquisition and digitalization of biomolecular information, including computer-assisted analysis. (ii) Establishing novel human organoids as relevant models for human diseases and for the reduction of animal experiments. (iii) Exploitation of the developed technologies in novel, highly integrated applications for the pharmaceutical, diagnostic, and medical technology industries, and, ultimately, for clinical routine. In summary, this project will foster a move towards reaching a digitalized clinical pathology and the development of new human organoids for preclinical research. It will combine different analytical modalities to a novel way of three-dimensional representation of tissues, and it will create a powerful platform for innovative applications for the health industries.

T3

Dr. Elmar Bourdon, Medical Technology Cluster Mannheim

Title: "Medical technology opportunity Rhine-Main-Neckar: The regional response to transformation in technology and healthcare."

Abstract: With global sales of approx. 350 US$ billions, a 2005-12 CAGR of +6% and large-cap operating margins of 24% of sales 2005-12 the medical device industry continues to be a growth opportunity. While 95 % of companies are SMEs they face an increasingly strong regulatory and clinical environment, and the transformation of public healthcare towards incremental cost-effectiveness. The focused integration of different medical device technologies, biotechnology and digital systems may help to facilitate the clinical innovation needed in such a changing environment. This will ultimately result in a change of business models towards M&A and externalisation of R&D. Against this background, this presentation provides an overview of the regional medical technology ecosystem and a perspective on how it is responding to these changes.

T4

Dr. Lluís Quintana, Viscofan BioEngineering

Title: „Viscofan BioEngineering – von der Wursthülle zum Medizinprodukt“

Viscofan BioEngineering is a business unit of Naturin Viscofan GmbH – a company of the Viscofan group. The modern production facilities including a GMP plant are located in Weinheim, Germany. A dedicated international team covers the complete value chain from research to development and sales of novel collagen products.

Naturin Viscofan is the center of excellence for collagen products within the Viscofan group. We apply partly proprietary technologies and standardized extraction methods to process collagen from bovine skin for the development and industrial-scale production of novel collagen biomatrices in research, medical and food grade. The combination of premium products with an exceptional scientific support positions Viscofan BioEngineering at the forefront of regenerative medicine.

Our comprehensive portfolio is based on collagen membrane, mass, suspension and hydrolysate to serve cell biology, biomedical and nutraceutical markets. The products are suitable for a broad range of novel applications, such as improved tissue engineering, new surgical procedures or advanced medical devices. Together with its partners, Viscofan BioEngineering is also developing its own pipeline of products in regenerative medicine.

T5

Dr. Gitte Neubauer, Cellzome – a GSK company

Title: “Enhancing the understanding of disease and drug mechanisms”

Abstract: Since acquisition by GSK in 2012, Cellzome became a central technology platform within GSK’s R&D organization to understand how drugs work on a molecular, cellular and tissue level for better predictivity of efficacy and safety. Working with all therapeutic areas of GSK’s R&D organization requires constant innovation and platform evolution to address the diversity of questions raised, especially for unprecedented targets and modalities. We therefore continued to advance Cellzome’s proteomics platform and collaborated with the European Molecular Biology Laboratories (EMBL) to broaden our technology base to include metabolomics and genomics. Based on five years of successful collaboration locally between Cellzome and EMBL, GSK entered a strategic collaboration with the institute to foster more interactions across GSK R&D globally. This presentation describes how a collaboration between a basic research institute and a pharma company exploits complementarities benefitting both partners.

T6

Dr. Ruth Herzog, Technology Transfer DKFZ

Title: „From patents to patients“ – 20 years Technology Transfer at the DKFZ

Abstract: It is expected that excellent research will also lead to innovations in the market place and generate revenues to be ploughed back into research. However, that's easier said than done. This talk will showcase pearls and pitfalls in technology transfer from academia to companies and make an attempt to look into the future.

T7

Dr. Wulf Fischer-Knuppertz, BIOCRATES Life Sciences AG

Title: “Can Metabolomics be NextGen IVD?”

Abstract: Targeted metabolomics is applied every day thousands fold to diagnose inborn metabolic errors in newborns from a drop of blood before manifestation of disease („Newborn Screening“). The screening is conducted on mass spectrometers which are not yet widely established in routine clinical laboratories. Big diagnostics companies are more and more bringing this new instrument technology into diagnostic routine use to more sensitively identify drug metabolites or to replace mainly immuno assay tests due to its higher analytical accuracy (TDM, DOA, esp. steroid hormones).

Other technologies like sequencing have yet failed to deliver on the clinical expectations that were raised by the ability to identify the individual genotype. The genotype alone can only in a few cases be indicative for diagnosis, treatment, prediction and prognosis of a disease. The individual clinical phenotype comes more in focus as it represents the actual status of the individual also in correlation to his external environment and his endogenous ´exposure` like nutrition, drug treatment and microbiom.

Many examples show that the ´metabolic phenotype` may have the potential to open up a new dimension in diagnosis, understanding and treatment of complex diseases. Mass-spectrometry allows a broad quantitative multiplexing of endogenous metabolites and thus to establish a ´metabolic signature` which is very specific for a clinical question (e.g. prediction of Alzheimer´s disease, prediction of response to a chemotherapy, etc.). The slow progress to establish target metabolomics in diagnostic routine applications is partly dependent on a lack of technology maturity and a lack of funding to replicate first interesting findings in clinical studies.

T8

Dr. Clemens Suter-Crazzolara, SAP SE

Title: „Improving Patient Outcomes Through Actionable Data Insights“

A dramatic revolution is taking place in the health arena. More and more, today's patients are taking charge of their health experience. Driven by consumer trends and scientific progress, patients expect medical decisions to be tailored to their specific needs, so that they can live full and healthy lives. The combination of patient involvement and big data analysis will boost innovation, leading to better prevention, diagnosis, treatment and care. This ambitious goal can only be achieved when the patient and the patient data are fully incorporated into the treatment process. Data silos must be broken down, and big data analyses must be carried out in seconds, not hours. Data should be available anywhere and anytime to users: patients, doctors, researchers, and drug and device developers should be enabled to optimally collaborate on health information.

T9

PD Dr. Andrée Rothermel, Cluster for Individualized ImmuneIntervention (Ci3)

Title: "The Cluster for Individualized ImmuneIntervention (Ci3): Development of innovative immunotherapies and beyond"

Abstract: Due to demographic changes and the resulting increase in the incidence of severe diseases, our health care system is facing new challenges. Individualized medicine offers new opportunities for more effective, well-tolerated and economically sustainable treatments of these diseases. The Cluster for Individualized ImmuneIntervention (Ci3) with its multidisciplinary network of more than 100 partners from academia, research institutions, SMEs and large companies fosters the development of highly innovative therapeutic and diagnostic products as well as technology platforms. In this context, Ci3 focusses on paradigm shifting advancements in the field of individualized immunotherapies to improve the lives of patients suffering from cancer, autoimmune diseases and infections. In order to enlarge the framework for the development of immunotherapies and to generate long-term benefits, Ci3 is in constant dialogue with various stakeholders of the healthcare sector (e.g. patients, physicians, payers, healthcare providers and manufacturers). Beyond that, Ci3 is acting as a national and international connector and translator to initiate and to promote collaborations between academia and industrial partners.

T10

Dr. Kai Gräber, Cluster for Individualized ImmuneIntervention (Ci3)

Title: "PERMIDES – Support for IT-based innovations in the biopharmaceutical industry"

Abstract: Within the scope of the multi-national EU project PERMIDES, Ci3 and five other European clusters support SMEs from the biopharmaceutical industry to implement groundbreaking cooperation projects with partners from the IT sector. In order to develop IT and bioinformatics solutions that suit their needs, companies can apply for consultancy, innovation, and travel vouchers, for which a total funding of 3 million EUR is available. PERMIDES has established a semantic matchmaking platform (www.permides.eu) that allows SMEs to identify suitable cooperation

partners in the biopharmaceutical and IT industries for joint projects based on their respective needs and expertise.

T11

Dr. Joachim Moecks, bioMcon GmbH, **Dr. Vitor Vieira, Inova DE GmbH**

Title: "PERMIDES innovation project: AutoMax User Interface (AMUI)

Abstract:

Medical Need: With the rise of targeted drugs in oncology, pathology institutions are facing novel challenges: targeted drugs require specific aberrations of cancer-cells and new diagnostic methods to identify eligible tumors. Image-based molecular pathology extracts and quantifies specific features from these images, as to define which biomarkers have positive detection and consequently aid the treatment decision. With the wide scope of new targeted drugs, the importance of this work drastically increased over the last decade. Typically, it is carried out by viewing on a microscope with manual steps for documenting the obtained quantifications – a tedious and failure-prone process.

AutoMax: bioMcon's software employs newly developed advanced image analysis tools for automating the extraction and quantification part. It runs on standard hardware and needs only regular color photos for valid results. There is no need for special hardware, and can thus fit to every pathology lab configuration. It represents a valuable support tool for the responsible pathologist, as it is tuned to effectively assist with this task.

AMUI: A specialized AutoMax User Interface is key for integrating AutoMax into the pathologist's workflow. Enabled by a PERMIDES Innovation Voucher, AMUI is presently under work by the medical IT company Inova DE. AMUI compiles images for uploading and processing, helps in inspecting the output and in documenting the medical decision, and regulates all front-end and back-end traffic. AMUI + AutoMax make advanced image analysis operable for every pathology lab. This will reduce the workload of pathologists and improve the consistency and precision of results.

The Health Axis Europe

The Health Axis Europe (HAE) is a strategic alliance between the biomedical clusters Leuven (Belgium), Heidelberg (Germany), Maastricht (Netherlands) and Copenhagen (Denmark). The aim of the Health Axis Europe is to pool together the innovative energy of the three locations in order to strengthen international competitiveness.

The alliance supports the initiation and coordination of large EU-promoted R&D projects, cross-border cooperation in the training and further education of talented persons, and cross-border investments and cooperation between established VC funds.

Find further information at www.health-axis.eu

T12

Dr. Julia Schaft– BioRN Cluster Management GmbH

Title: "The Health Axis Europe Partnering Platform"

Abstract: Small and medium sized companies (SME) and academic research groups are the innovation engines in the Life Sciences worldwide, the global health industry increasingly depending on them to continually diversify and adapt their product portfolio to a rapidly changing health market. SME and academia are often lacking the financial power to see their ideas through to the final application on their own and are relying on investments from large companies to bridge these financial limitations. Despite the mutual benefit for both the global industry and SME/academic institutions, effective interconnectedness between these different players especially on an international level today is rather limited. Current strategies to establish these connections are often flawed with not-aligned processes, lack of trust, IP complications, time restrictions and limited range.

The Health Axis Europe Partnering Platform (HAEPP) project aims to bundle the innovative strengths of science and industry and will provide a new tool for international knowledge exchange, leading to facilitated technology transfer between academia and small and medium sized enterprises on the one side and global healthcare companies on the other.

The HAEPP has two key advantages over existing partnering and scouting models:

- **tailor-made**: only projects that fit the specific search profile of the global healthcare company are presented
- **critical mass**: projects are scouted from a large pool of innovators (not just regional, not just national but international scouting)

Project partners in the HAEPP are BioRN, the University of Applied Sciences Mannheim, University Heidelberg, the Ci3 cluster Mainz and the Health Axis Europe cluster partners KU Leuven, Maastricht University and University of Copenhagen.

T13

Nico Stam (PhD, MBA) – Brightlands Maastricht Health Campus

Title: "Brightlands, world-leading innovations in Health & Materials"

Abstract: Based in the southeast of the Netherlands, Brightlands Maastricht Health Campus and Brightlands Chemelot campus are leading in innovation and home to a vibrant and fast-growing community of innovation driven companies and knowledge institutes. The campuses offer state of the art R&D and manufacturing infrastructures, on-campus education, bootcamp programs, and science-oriented business support, and venture capital. With their location and ecosystem, the campuses are a unique location for innovative start-ups, spin-offs, corporations, forward-thinking

knowledge institutes, and daring entrepreneurs. Brightlands Maastricht Health Campus, focuses on regenerative medicine, cardiovascular research, and high-end innovative molecular biomedical imaging technologies. The campus is also home to a clinical and general hospital, a network of specialized clinics, and a renowned university faculty specialized in health, medicine, and life sciences. Brightlands Chemelot Campus is a creative breeding ground for innovation in smart materials and sustainable manufacturing.

T14

Michael De Blauwe, KU Leuven Research & Development

Title: "The Leuven R&D ecosystem – innovation in biotech"

Abstract: For the second year in a row, KU Leuven leads the Reuters ranking of Europe's most innovative universities. Imperial College London and the University of Cambridge are second and third on the list. "KU Leuven earned its first-place rank, in part, by producing a high volume of influential inventions," according to Reuters. But what is it that makes the Leuven researchers more innovative, which inventions were made in Leuven, and how does this impact the importance of the biotech sector ? Technology transfer is one of the key ingredients to this success.

KU Leuven Research & Development (LRD) is the technology transfer office (TTO) of the KU Leuven Association. Ever since 1972, LRD has been building bridges between science and industry. By transferring knowledge and technologies to society and the marketplace, LRD advances the impact of research results on people's lives around the globe. LRD supports researchers throughout the entire knowledge and technology transfer process and helps them to best leverage the societal and economic potential of their research. LRD has developed a solid tradition of collaborating with industry, securing and licensing intellectual property rights, creating spin-off companies and stimulating knowledge-driven regional development.

Within KU Leuven Research & Development, Michael De Blauwe works as Business Development Manager. Next to branding the Leuven region and seeking opportunities between top researchers, high tech companies and financial investors, Michael also holds the position of General Manager at Bio-Incubator Leuven and President at the Innovation & Incubation Center.

Short Talk Abstracts (S)

S1

Authors: Dr. Renate Sekul, Dr. Benjamin Meyer, Dr. Volker Stadler, PEPperPRINT GmbH, Heidelberg, Germany

Title: "The microarray-based SeroRA Library with posttranslational modifications for the multiplexed analysis of immune profiles in rheumatoid arthritis"

Abstract: Many autoimmune patients exhibit a rather diverse pattern of autoantibodies to various target proteins. In particular, early disease stages can be difficult to diagnose and to discriminate from related diseases. However, the precise knowledge of antigenic proteins and their underlying epitopes can provide the basis for innovative serological tests for the early and differential diagnosis of autoimmune diseases.

High density peptide microarrays can display large numbers of putative target proteins translated into overlapping peptides including their corresponding post-translationally modified sequences. Linear and conformational antibody responses can be analyzed with unmet speed and precision to yield IgG, IgA and IgM specific epitopes. As high throughput screening platform, peptide microarrays are ideally suited to identify comprehensive biomarkers for reliable diagnostic tests.
Recently, PEPperPRINT has initiated a new biomarker discovery project for the identification of novel serological epitope markers for the early diagnosis of rheumatoid arthritis. For biomarker discovery, the new SeroRA library was designed with more than 120,000 linear and conformational peptides derived from all currently known RA antigens and candidate antigens. The library further includes all possible citrullinated and homocitrullinated epitope variants, thus providing a so far unmet search area for biomarker discovery. The first results of a large cohort screening will highlight the potency of the new SeroRA library for IVD and CDx development in rheumatoid arthritis.

S2

Authors: Dr. Ronny Schmidt, Camille Lowy , Christoph Schröder, Sciomics GmbH, Research & Development, Heidelberg, Germany

Title: "Cost-effective affinity proteomic profiling for Precision Medicine - biomarker discovery and disease mechanism investigation"

Abstract: Innovative biomarker signatures are a cornerstone of precision medicine especially in the immune oncology and oncology field. To facilitate fast, open-topic as well as costeffective discovery and verification of new biomarker signatures for Companion Diagnostics or stand-alone diagnostic means, scalable immuno-based platforms offer unique advantages. The German Cancer Research Centre and Sciomics have developed the antibody based scioDiscover platform combining broad

coverage of 900 proteins and profiling of phosphorylation status with all advantages of immunoassays such as sensitivity, ability to analyse non-fractionated/non-depleted samples in a native state, minimal sample requirements and easy transferability into clinical used immunoassay platforms such as ELISA without any platform technology changes required. Using the scioDiscover platform technology, various biomarker signatures have been identified using an open and collaborative innovation approach. This innovation approach resulted in a protein signature discriminating responding from nonresponding patients prior to an anti-PD1 therapy as well as a risk-stratification and early diagnostic signature for acute kidney injury (AKI). Additional biomarker signatures from plasma or serum, tissue, cell samples, and cerebrospinal fluid are under investigation.

S3

Prof. Dr. Thorsten Röder, M²Aind – Multimodale Analytik und intelligente Sensorik für die Gesundheitsindustrie. Hochschule Mannheim

Title: Process intensification as the basis for medical biotechnology

Abstract: One important basic for biomedical innovation is the modern Synthesis chemistry. The therapeutic use of small molecules is still imported significant. We will show new methods to produce these small molecules. These techniques are micro reactors, flow-chemistry and online analytics. With these tools a reproducible, efficient and safe manufacturing processes for APIs can be realized.

S4

Dr. André Domin, Technology Park Heidelberg

Title: "The Life Science Accelerator Baden-Württemberg"

Abstract: The Life Science Accelerator Baden-Württemberg was created through the joint commitment of the MAFINEX Gründerverbund e.V., the foundation for medical innovations in Tübingen, Heidelberg Startup Partner e.V. and Technologiepark Heidelberg GmbH. Through the cooperation of the founder associations and research institutions, the startup scene in Baden-Württemberg shall be strengthened and the attractiveness of the partner cities as start-up locations shall be increased. The Life Science Accelerator BW therefore provides a startup support in three stages: In a "Needs Identification" module, medical problems are first identified at research facilities and clinics. The "MedTech Startup School" as a second module supports students and scientists in the transformation of innovative ideas into validated business models. Participants will be supported by doctors, scientists, mentors and industrial partners. The intense "Life Science Accelerator" qualification program is the third module in which existing startup teams in the pre-seed or seed phase are helped to accelerate and optimize their development process. Experts from industry and research support the teams to find suitable partners, develop sustainable business plans and present them to investors. The accompanying seminar program includes, among other things, the necessary business management skills, presentation training and "business model innovation" basics.

The Life Science Accelerator Baden-Württemberg is funded by the European Social Fund (ESF) and the federal state of Baden-Württemberg through the Ministry of Economic Affairs, Employment and Housing Development Baden-Württemberg.

More detailed Information about the Life Science Accelerator can be found on the website: www.lifescience-bw.de

S5

Dr. Goran Martic, TRON – Translational Oncology at the University Medical Center of the Johannes Gutenberg-University Mainz gGmbH

Title: Innovative Translational Research for Personalized Medicine

Abstract: TRON – Translational Oncology at the University Medical Center of the Johannes Gutenberg-University Mainz gGmbH – is a biopharmaceutical research institute developing new diagnostics and drugs for the therapy of cancer and other diseases with high medical needs. TRON focuses on generating new platforms for personalized therapy concepts and biomarkers, and thus on transferring basic research into new drug development. In cooperation with academic institutions, biotechnology companies and the pharmaceutical industry, the most advanced technologies are used for cutting-edge research at TRON.

TRON investigates immunological mechanisms and the possibility of therapeutic modulation therein. The research focus is on cancer immunology and genomics and our scientists identify and characterize disease-relevant molecular targets. We also design and improve innovative technologies in the areas of biomarker research and biopharmaceutical drug development. Internal research projects are complemented by numerous partnership models for collaboration with academic institutions and industry. This short talk will give an overview on TRON's mission, focus and recent achievements.

S6

Dr. Benjamin Steeb, Springer Campus, Heidelberg, Germany

Title: Distance-Learning Degree Programs in Biology and Chemistry for Laboratory Assistants and Technicians

Abstract: The **Springer Campus** distance-learning courses enable employees to study for a Bachelor of Science while working, preparing them for new tasks within the company. Intensive supervision by experienced teaching staff, minimal attendance together with onsite study groups ensure a tailor-made learning experience!

What makes Springer the ideal partner for a distance-learning degree program?

• Leader in the textbook field: Springer is the leading publisher for German-speaking universities. Conveying educational content is our key competence.

• Strong cooperation partner: Springer works with respected universities and institutions for bachelor's and master's degrees.

• Intensive supervision: The drop-out rate for our degree programs is extremely low, thanks to intensive supervision and personal contact with students as well as the onsite tutors.

• Established and successful: The Biology degree program has been successfully run by the Johannes Gutenberg University Mainz and Springer for 20 years, and in this time has enjoyed a consistently high level of participant satisfaction.

www.springer-campus.de

S7

Dr. Sven Kuhlendahl, PROGEN Biotechnik GmbH

Title: „Breaking new ground in protein detection, quantification and purification"

Abstract: Since 1983, PROGEN has been an established manufacturer and supplier of premium antibodies, in vitro diagnostics, and reagents for the global life science research community. While PROGEN's antibodies are among the most published antibodies in biomedical and cell biology literature, its ELISA kits aim at niche markets. Based on its core competence in immunochemistry, the company now intends to become a driver of innovative antibody technologies for protein detection, quantification, and purification. PROGEN is therefore actively looking for collaborators in academia and industry for flexible co-development.

S8

Dr. Nadja Pfetzer, Business Development Hummingbirds Diagnostics GmbH

Title: "Hummingbird Diagnostics GmbH - Detecting disease early for tomorrow's health"

Abstract: Cancer is one of the leading causes of death worldwide, with lung cancer having the highest mortality rate. In most cases, early detection of the disease greatly increases the chances for successful treatment and the patients' survival rate. More than 60% of lung cancer patients are diagnosed in late stages with a five-year survival rate of 10%, while at stage I the five-year survival rate of 70% is much more beneficial for the patient. This shows the urgent need for early cancer diagnosis.

Hummingbird Diagnostics (HBDx), in close collaboration with Saarland University, discovered a reliable microRNA (miRNA) biomarker set from whole blood to detect lung cancer already at early stages. Micro RNAs (miRNAs) are small regulatory molecules, which control specific cellular

processes, thereby maintaining proper function of a cell. It was demonstrated that changes in miRNA profiles correlate well with various pathological conditions. HBDx is currently validating these disease-related miRNA fingerprints in clinical samples. A blood test based on this marker set has great potential to eventually replace invasive diagnostic techniques, such as tissue biopsies.

The technology pipeline is not only limited to cancer. A large variety of diseases, like Alzheimer's disease, multiple sclerosis, Parkinson's disease and heart failure can also be detected by distinct miRNA patterns. Furthermore, other fields, such as non-health applications are conceivable for exploiting miRNA biomarker patterns.

Our work highlights the diagnostic potential of minimally invasive and patient-friendly miRNA signatures as valuable biomarkers for early disease detection and represents a vital step towards the promise of precision medicine.

S9

Dr. Brandon Malone; NEC

Title: "Learning clinical outcomes from irregular, multivariate time series"

Abstract: Over the course of a patient's stay at a hospital, many measurements, such as blood pressure or ECG signals, may be recorded to monitor their status. However, these time series observations are often irregularly sampled, both in the sense that the sampling frequency differs between measurements and that the measurements are not made at the same points in time. Further, some measurements are not made for some patients at all. Thus, standard multivariate time series analysis approaches typically fail in this setting.

In this work, we propose a novel machine learning approach, based on Bayesian optimization, which yields state-of-the-art predictive results for patients' clinical outcomes. Specifically, we focus on predicting in-hospital mortality given measurements from the first two days of a patient's stay. We account for the irregular nature of the time series by calculating aggregate statistics which summarize the observed measurements. We use a flexible, ensemble-based machine learning approach to model the complex relations among the different measurements. Comparison to recently-published, state-of-the-art methods demonstrates the efficacy of our approach.

S10

Dr. Manfred Schmidt, GeneWerk GmbH

Title: GeneWerk GmbH

Abstract: Based on more than two decades of research and expertise in the field of gene therapy, GeneWerk GmbH was founded 2014 in the heart of biotechnology metropolitan area Rhein-Neckar, Heidelberg, Germany. Starting with clonal repertoire analyses to characterize hematopoietic repopulation upon autologous transplantation, our focus early went on vector safety and risk assessment studies in preclinical and clinical gene therapy. We accompanied the majority of the

global retroviral gene therapy clinical trials *(e.g. Schmidt et al. NatMed 2003, Hacein-Bey-Abina et al. Science and NEJM 2003, Ott et al. NatMed 2006, Braun et al. SciTranslMed 2014)*, the first lentiviral clinical trial *(Cartier et al. Science 2010)* and the European Medicines Agency approval of Glybera, the first western gene therapy medicinal product *(Kaeppel et al. NatMed 2013)*. Aside of vector safety analyses, we also offer next generation sequencing based gene editing on-/off-target analyses and immune repertoire studies in T and B cells. Thereby we provide highly sensitive technical platforms, customized bioinformatics and programming as well as consulting (www.genewerk.com). Our portfolio is completed by our participation in several consortia (e.g. EU Horizon2020 SCIDNET, NC3R CRACK IT) that allows us to focus on our mission - to improve the safety of novel gene and immune therapy products for patients and help reducing the reliance on animal models.

S11

Dr. Stefanie Wolters, Transferinitiative RLP, Focus ‚Personalized Medicine'

Title: "Transferinitiative RLP, Focus ‚Personalized Medicine'"

Abstract: Personalized medicine has the potential to revolutionize the health system. New insights into molecular biology and latest information technology enables more efficient diagnosis and specific treatment of disease. The deep understanding of our biology provides new chances to cure.

However, translation of discoveries in academia into a better treatment of patients faces many challenges. Findings from basic research need to be validated and implemented in industrial workflows. The development of innovative drugs and novel diagnostics is not only very time consuming and costly but also associated with a high risk to fail. Therefore, a tight network of players from industry and academia is needed to enable technology transfer.

The Transferinitiative RLP brings together partners from the entire innovation chain to facilitate knowledge and technology transfer. Through organisation of conferences, workshops and seminars we provide a platform to maintain and expand your professional network. We believe that only through cooperation we will be able to exploit the great potential of personalized medicine.

www.transferinitiative-rlp.de l contact: wolters[at]img-rlp.de

S12

Dr. Garrit Jentsch, BAST GmbH

Title: BAST: Model Based Drug Development

Authors: Garrit Jentsch, Pinar Boyraz Jentsch, Joachim Grevel

At BAST we enable our clients to make informed decisions and mitigate risks by providing state-of-the-art modelling and simulation support. We provide fit-for-purpose pharmacometrics consultancy services ranging from stand-alone data analyses to long-term strategic project support leading to NDA submissions.

At BAST, we support our clients throughout the clinical development pipeline. In the past, our work included:

- the translation of results from preclinical animal studies to human patients for the design of first in man clinical trials.
- the analysis of phase 1 clinical data to support the design of subsequent clinical trials.
- the delivery of clinical pharmacology packages needed for market approval.
- the support of life cycle management with simulations.

By capturing project knowledge in a continuum of mathematical models, BAST is able to predict the outcomes of the next development steps. Thus, our work allows our clients to make optimal investment decisions.

S13

Dr. Thomas Centner; io-consultants

Title: "io-consultants, customer-specific solutions for investment projects in the pharmaceutical and biotech industry – from consulting and concept design to implementation and qualification."

Abstract: From businesses in their start-up phase to global players – io-consultants provides customized consulting and planning services in the area of pharmaceuticals and biotechnology as a lead consultant. Our support allows you to focus on the essentials of your business and benefit from the cooperative partnership with io-consultants.

With our biotech and pharma expertise in the areas of drug substance manufacturing, aseptic filling, single use technologies, containment, packaging, track & trace, pharma logistics and IT/automation we will create tailored solutions fitting your specific requirements.

io-consultants is one of the leading technical consulting and planning companies, Bringing together the corporate expertise from 200 employees in the io-consultants disciplines Architecture, Logistics planning, Factory and process design, Pharma/Biotech, SAP/IT Consulting, Healthcare and Catering, in Heidelberg - and five locations across the world.

References: AstraZeneca, Bayer, B. Braun, Dr. Franz Köhler Chemie, EVER Neuro Pharma, Glycotope, LTS Lohmann, Merck KGaA, Pfizer, PHARMAQ, Polpharma Biologics, Rentschler Biotechnologie, Sandoz (EBEWE), Sanofi, TEVA (Merckle Biotec), WALA

Contact: Dr. Thomas Centner: thomas.centner@io-consultants.com

S14

Dr. Thomas Prexl, HD Startup Partners

Title: "The Up2B Startup Accelerator"

Abstract: The Up2B Accelerator is an accelerator program that enables early-stage startups to find their product/market fit. During a nine-week program, called "Breakthrough", founders will validate their concepts in real market conditions to turn their vision into products and build up a startup.

The Accelerator targets startups from the field of IT and Digitalization, with the main focus on entering into the B2B market.

Startups benefit from qualitative workshops, events and networking with experts, professional coaches, decision makers and investors.

The Up2B Accelerator is a joint initiative of innoWerft – Technologie- und Gründerzentrum Walldorf Stiftung GmbH, mg: mannheimer gründungszentren gmbh and Technologiepark Heidelberg GmbH. It is located in the region „Upper Rhine Valley" with the benefit of Germany´s best universities, a various number of research labs and worldwide known software companies as SAP SE and Software AG.

S15

Dr. Bernd Lecher, mfd Diagnostics GmbH

Title: "Next Generation of Bioanalyser: NADH Autofluorescence Bioanalyser NADHJA®"

Abstract: With the new bioanalysis device NADHJA® developed by mfd-Diagnostics you have the opportunity to measure the key enzyme NAD of the energy metabolism in cells via autofluorescence. The co-enzyme NAD is switching the energy production of the cell from aerob to anaerob depending on the energy demand and oxygen availability. The anaerob glycolysis will be carried out during sufficient oxygen supply generating CO_2 and H_2O. During oxygen deficiency energy will be produced anaerob generating lactate. The anaerob glycolysis is only a quarter as efficient as the aerob kind and the generated lactate is influencing the vitality of the cell. By measuring the autofluorescence of the NADH by a faser-optic laser system you can determine this situation for the very first time non-invasiv and in real-time. An application of a fluorescent marker is not necessary. You can measure permanent without disturbing the cellular system. This kind of technique suits excellent for use in biomedical basic and industrial research.

S16

Peter Heger, Health Research Services GmbH

Title: Efficacy of ERr731® (Extract Rheum rhaponticum)

Abstract: The special Extract of Rheum rhaponticum is used since the 1950s for the relief of mental and neuro-vegetative disorders due to menopause, like hot flushes/sweatings, sleep disorder, depressive mood and anxiety. Until 2005 ERr 731 was used also for women with cycling irregularities like amenorrhoe, dysmenorrhoe, oligomenorrhoe and breast tenderness in a dosage of 4mg ERr 731 once per day. Clinical studies entailing two-year application of ERr 731 have proved its efficacy and safety in the treatment of menopausal symptoms. For example, after 8 and 12 weeks ERr 731 has been shown to severely reduce menopausal hot flushes measured by Hot Flush Weekly Weighted Score (HFWWS) compared to low-dose hormone therapy. ERr 731 has also shown to alleviate anxiety and depression and to improve Quality of Life. Individual and aggregated study data will be presented.

Health Research Services GmbH has the exclusive rights to distribute ERr 731 abroad.

S17

Prof. Dr. Matthias Rädle, **M²Aind – Multimodale Analytik und intelligente Sensorik für die Gesundheitsindustrie. Institute for Process Control and Innovative Energy Conversion (PI), Hochschule Mannheim**
Title: "Scanning Technologies in Biomedical Applications"

Authors: Matthias Raedle, Lukas Schmitt, Julian Deuerling, Marcel Nachtmann

Abstract: Optical imaging technologies are commonplace in fields where structured surfaces or volume fractions should be monitored. The available information range from gray scale images up to middle infrared images in transmission, remission or from self emitting surfaces.

To obtain additional molecular information, spectral information is needed, specifically the near infrared, middle infrared, fluorescence and Raman spectra are of particular interest.

Embedded in a combined development in the M2Aind-Initiative at UAS Mannheim, a variety of multispectral scanning technologies are in development.

The different upcoming apparatuses vary in capability including their scanning spectral range, resolution versus scanning area, weight of possible probe heads as well as the measuring dimension (1D, 2D, 3D).

Target scanning applications are wounds, fluid films, scin, malignant tissue, 3D –cell cultures, muscles among others.

Examples of different implementations extending the microscale up to middle scale will be presented.

S18

Stefan Jungbluth, European Vaccine Initiative (EVI)

Title: European Vaccine Initiative (EVI)

Abstract: EVI is a leading European non-profit Product Development Partnership (PDP) that has the principal objective to develop effective, accessible, and affordable vaccines against malaria and other diseases of poverty. Since its inception in 1998, it has contributed to the development of more than 30 malaria vaccine candidate formulations, with about 25 vaccine candidates being advanced into Phase I clinical trials, three of which have been transitioned for further clinical development in sub-Saharan Africa. EVI leads global efforts in the development of vaccines against diseases of poverty, while also acting as coordinator of several initiatives to create harmonisation between global stakeholders in vaccine research. EVI´s product portfolio currently includes vaccine candidates against pathogens such as Zika and influenza viruses, as well as Leishmania in addition to malaria.

The EVI poster and oral presentation will provide information about the context in which EVI is operating and will highlight particular aspects of our current activities.

S19

Dr. Thomas Schirrmann, YUMAB GmbH

Title: "YUMAB – Human monoclonal antibody technologies"

Abstract: YUMAB is a German biotechnology company founded in 2012 in Braunschweig and provides technologies, services, contract research as well as partnered collaborations with a main focus on the discovery and development of novel fully human antibodies. In little more than five years, YUMAB has become a global player in human antibody development and drives the general trend in the immunotherapy space towards the use of fully human antibodies for therapeutic applications. Our mission is to provide best recombinant, fully human antibody technologies for advanced research and diagnostics as well as therapeutic discovery with a direct link to drug development without the burden of previous high technology upfront costs and inflexible licensing conditions.

Poster Abstracts (P)

P1

Verena Fath, Hochschule Mannheim

Title: "Reaction Monitoring and Self-Optimization of an Organometallic Reaction by Mass-Spectrometric Analysis"

Authors: *Verena Fath[†], Philipp Weller[‡], Stefanie Szmais*, Sebastian Härtner*, Peter Leonhard*, Claudia Enders*, Matthias Fritzsche*, Thorsten Röder[†]*

[†]Institute of Chemical Process Engineering, Mannheim University of Applied Sciences, Paul Wittsack-Str. 10, 68163 Mannheim, Germany

[‡]Institute of Instrumental Analytics and Bioanalysis, Mannheim University of Applied Sciences, Paul-Wittsack-Str. 10, 68163 Mannheim, Germany

**Merck KGaA, Darmstadt, Germany*

Abstract: Since flow chemistry offers many benefits over batch chemistry, the use of micro-structured devices within organic syntheses is of deep interest. With respect to short residence times and a highly efficient heat and mass transfer unintended decomposition reactions of intermediates can be minimized and processes can be carried out controllable even at higher temperatures. Furthermore, higher yields and a better selectivity can be reached. Focus of up-to-dates research is in the self-optimization of reactions involving intelligent algorithms that speed-up the process by integrating a feedback into it.

The objective of this work is the complete automation of a reaction monitoring based on concentration profiles that are gained through mass-spectrometric online analyses without a prior chromatographic separation of the reaction mixture using an intelligent algorithm.

In addition to the investigated metalorganic synthesis within this work the procedure can also be assigned to different biochemical processes.

P2

Dr. Tobias Schunck, Fraunhofer ICT-IMM

Title: "CTCelect: Fully automated singularization of CTCs from blood for cancer immunotherapy"

Abstract: In the field of cancer diagnostics, "Liquid Biopsy" is gaining interest as novel approach for monitoring therapy by identification of cancer biomarkers in patient blood. The aim is to derive prognostic and therapeutic statements from them. Potential markers which are suitable for this purpose are free circulating tumor cells (CTCs) as well as microvesicles (e.g. exosomes) and cell-free tumor DNA (cfDNA).

Within the framework of a BMBF funded CI3 cluster project, we developed the fully automated CTCelect system which provides CTCs for state-of-the-art single cell analytics. The CTC isolation

process starts with a whole blood sample in a standard clinical sampling tube. The system enriches, detects and finally dispenses single CTCs resembling the starting point for single cell analysis.

The main strategy is implemented in two main functional modules of the instrument. The first step is a large volume liquid handling unit (7.5 to 10 ml) for immunomagnetic enrichment of CTCS followed by the fluorescently labelling of the cells with a second, quantum dot-coupled antibody. In the second, microfluidic module, an integrated flow cytometry module detects fluorescently labelled CTCs and triggers the dispensing unit. The CTCs are then individually dispensed into wells of a 96 well plate.

On the basis of the model system (7.5 ml whole blood spiked with 20 MCF7 cells) a total of more than 75% of the spiked cells can be recovered in high purity and were successfully analyzed by tumor specific single cell RTqPCR. The whole process takes approximately 3 hours from loading the blood tube to unloading the 96 well plate. Manual steps are limited to (re)placing tubes, the microfluidic cartridge, and buffer bottles on the worktable.

P3 (see S1)

Authors: Dr. Renate Sekul, Dr. Benjamin Meyer, Dr. Volker Stadler, PEPperPRINT GmbH, Heidelberg, Germany

Title: "The microarray-based SeroRA Library with posttranslational modifications for the multiplexed analysis of immune profiles in rheumatoid arthritis"

P4

Ronny Schmidt, Sciomics GmbH

Title: "Identification of novel biomarker signatures for peri-operative acute kidney injury (AKI) by high content antibody microarrays"

Authors: Faikah Gueler[1], Camille Lowy[6], Ronny Schmidt[6], Gregor Warnecke[3], Christine Fegbeutel[3], Ralf Lichtinghagen[4], Björn Jüttner[5], Hermann Haller[1], Axel Haverich[3], Katja Hueper[2], Christoph Schroeder[6,7]

1 Departments of Nephrology and Hypertension, **2** Diagnostic and interventional Radiology, **3** Cardiothoracic, Transplant and Vascular Surgery, **4** Clinical Chemistry, **5** Anaesthesiology, MHH; **6** Sciomics GmbH; **7** Functional Genome Analysis, German Research Cancer Center

Background: Acute kidney injury (AKI) is a frequent and severe complication after solid organ transplantation. Incidence rates vary between 25-78% depending on the type of transplantation, the individual patient risk factors and ischemia times. So far, little is known about peri-surgical risk factors for AKI in patients scheduled for lung transplantation (lung-tx). In a prospective clinical trail, we aimed to identify new biomarkers by using high content antibody arrays (scioDiscover).
Material and Methods: We included 150 patients undergoing lung-tx into a prospective clinical trial. Patient urine and blood samples were collected prior to surgery at admission to ICU, and 6h, 24h, 3

days and 7 days after surgery. In a discovery pilot-study, we used a high content antibody array in consecutive plasma samples from 10 versus 10 patients with and without AKI to analyse global protein expression using scioDiscover.

Results: AKI was detected in 63% lung-tx patients within the first 48 hours after surgery according to the AKI network criteria. Investigation of pre-operative samples and samples acquired after surgery revealed several highly relevant proteins for prediction and early diagnosis of AKI. These protein signatures might be of critical importance to optimise individual patient care. Indeed, next to a set of novel biomarker candidates, also candidate proteins (e.g. Neutrophile Gelatinase Associated Lipocalin (NGAL), IGF binding protein) reported previously were confirmed in this study, underlining the significance of the identified proteins and the validity of the discovery approach. Conclusion: AKI is an important and frequent complication after lung-tx. Identification of new biomarkers for early onset of AKI will lead to better understanding of the pathophysiology of peri-surgical AKI after lung tx and to an improvement in patient care.

P5

Dr. Christoph Schröder, Sciomics GmbH

Title: "Novel patient stratification biomarker candidates for anti-PD1 biologics therapy"

Authors: Ronny Schmidt[1], Camille Lowy[1], Christoph Schröder[1], Jochen Utikal[2,3] Christoffer Gebhardt[2,3]

1 Sciomics GmbH, Research & Development, Heidelberg, Germany **2** UMM Universitätsmedizin Mannheim, Germany **3** German Cancer Research Center, Heidelberg, Germany

Abstract: Response rates for checkpoint inhibitor therapies such as anti-PD-1 biologics in metastatic melanoma patients reach more than 40% as a mono-therapy, increasing to about 60% when used in a combination approach. Therefore, it is urgently required to stratify patients in order to enable a beneficial treatment outcome, and minimise adverse events as well as treatment costs. In a collaborative effort using differential proteomics, we have identified a potential biomarker signature able to discriminate between responding and non-responding melanoma patients undergoing an anti-PD1 mono-therapy. The identified differentially abundant proteins include, among others, targets from the PD1/PDL1 signaling axis, soluble immune modulator molecules as well as various immune cell markers. Upon classifying the proteins according to biological functions general findings regarding immune system activation status and immune cell activity could be obtained. In non-responding patients, the immune system was in an active state. In responding patients, the PD1/PDL1, programmed cell death signaling pathway showed a negative regulation. PD1 and PDL1 do not show a consistent abundance level in responding and non-responding patients. The scioDiscover platform is likely able to identify biomarker candidates for other cancer entities as well as various other immune-therapy approaches due to the broad coverage of relevant protein targets.

P6 (see S6)

Dr. Benjamin Steeb, Springer Campus, Heidelberg, Germany

Title: Distance-Learning Degree Programs in Biology and Chemistry for Laboratory Assistants and Technicians

P7

Dr. Stefanie Bolte, BioNTech AG

Title: "IVAC MUTANOME – A first-in-human phase I clinical trial Targeting individual mutant neoantigens for the treatment of melanoma"

Authors: Ugur Sahin[1,2,3], Evelyna Derhovanessian[1], Matthias Miller[1], Björn-Philipp Kloke[1], Petra Simon[1], Martin Löwer[2], Valesca Bukur[1,2], Arbel D. Tadmor[2], Ulrich Luxemburger[1,2], Barbara Schrörs[2], Tana Omokoko[2], Mathias Vormehr[1,3], Christian Albrecht[2], Anna Paruzynski[1], Andreas N. Kuhn[1], Janina Buck[1], Sandra Heesch[1], Katharina H. Schreeb[1], Felicitas Müller[1], Inga Ortseifer[1], Isabel Vogler[1], Eva Godehardt[1], Sebastian Attig[2,3], Richard Rae[2], Andrea Breitkreuz[1], Claudia Tolliver[1], Martin Suchan[2], Goran Martic[2], Alexander Hohberger[3], Patrick Sorn[2], Jan Diekmann[1], Janko Ciesla[4], Olga Waksmann[4], Alexandra-Kemmer Brück[1], Meike Witt[1], Martina Zillgen[1], Andree Rothermel[2], Barbara Kasemann[2], David Langer[1], Stefanie Bolte[1], Mustafa Diken[1,2], Sebastian Kreiter[1,2], Romina Nemecek[5], Christoffer Gebhardt[6,7], Stephan Grabbe[3], Christoph Höller[5], Jochen Utikal[6,7], Christoph Huber[1,2,3], Carmen Loquai[3] & Özlem Türeci[8]

(1) Biopharmaceutical New Technologies (BioNTech) Corporation, Mainz, Germany. (2) TRON – Translational Oncology at the University Medical Center of Johannes Gutenberg University gGmbH, Mainz, Germany. (3) University Medical Center of the Johannes Gutenberg University, Mainz, Germany. (4) EUFETS GmbH, Idar-Oberstein, Germany. (5) Medical University of Vienna, Vienna, Austria. (6) German Cancer Research Center (dkfz), Heidelberg, Germany. (7) University Medical Center Mannheim, Heidelberg University, Mannheim, Germany. (8) CI3 Cluster for Individualized Immunointervention e.V, Mainz, Germany..

Abstract: The genome of cancer cells is inherently instable promoting multiple genomic alterations and epigenetic changes. This often stochastic process leads to a unique molecular profile of every given tumor. Recently, a series of independent reports revealed that neo-antigen specific T-cell responses are seminal for the clinical efficacy of immune checkpoint inhibitors. However, less than 1% of mutations appear to raise spontaneously occurring T-cell response in the tumor-bearing patient. Accordingly, only patients with a high burden of mutations profit from currently approved therapies.

To overcome this restriction, the IVAC® MUTANOME, a highly potent personalized neo-antigen-encoding RNA vaccine approach, harnesses the individual patient's mutation profile. To this aim, the individual mutation repertoire is identified by next generation-sequencing and 10 potentially immunogenic mutations per patient are selected. These are incorporated into a poly-epitopic RNA

vaccine for intra-lymphnode injection that is tailored to activate and expand the individual patient's CD4+ and CD8+ T cells against the respective patient`s unique cancer mutanome.

A phase I first-in-human trial has been initiated in 2013 in patients with stage III and IV malignant melanoma (NCT02035956) to test this fully personalized RNA vaccine concept. The objective of this clinical trial is to study the feasibility, safety, tolerability, immunogenicity and the potential anti-tumoral activity of the IVAC® MUTANOME approach.

Notably, in each and every patient (n=13) a strong poly-neo-epitopic immune response against vaccine antigens was detected. Overall, 60% of the selected neoepitopes elicited a T-cell response. Simultaneously, no severe adverse drug reactions were reported and indications for clinical activity were observed.

In this contribution, the multi-step manufacturing process triggered by a patient's enrollment, the study design and comprehensive immunological and clinical data from the treated patients will be presented.

P8

Patrick Illert, Institute for Chemical Process Engineering, Hochschule Mannheim

Title: "Synthesis of combined MRT/CT contrast agents for medical imaging"

Abstract: Computed tomography (CT) and magnetic resonance imaging (MRI) are two of the most important methods in medical imaging. CT images can be recorded with a high sampling frequency in a relatively short amount of time, thus motion sequences in a human body can be displayed. MRI is known for a similar resolution and detection threshold, additionally there is no exposure to X-ray. The combination of these two techniques and their advantages can be of use when displaying e.g. several forms of cancer. CT andMRI examinations often require contrast agents. Nowadays, CT contrast agents are known for side effects, allergic reactions, and low blood circulation time. Radiopaque nanopolymers aresupposed to replace the currently used 1,3,5triiodobenzene derivates. Advantages of these nanopolymers are a higher blood circulation time. Furthermore, copolymers can be added, which will execute specific tasks in the human body during the examination (e.g. targeted adsorption in specific tissue). In MRI, superparamagnetic iron oxide nanoparticles are supposed to replace the less biocompatible gadolinium (Gd3+) complexes.

In this project, a production process fora combined MRI/CT contrast agent in form of core/shell nanoparticles is investigated. By systematic variation of the reaction parameters in the process, the particle size of the contrast agent can be controlled.

P9 (see S9)

Dr. Brandon Malone; NEC

Title: "Learning clinical outcomes from irregular, multivariate time series"

P10

Dr. Thomas Bukur, TRON (Translationale Onkologie an der Universitätsmedizin der Johannes Gutenberg-Universität Mainz gemeinnützige GmbH)

Title: "VirusID – Detection and Identification of Viruses using Next Generation Sequencing"

Thomas Bukur, Jos de Graaf, Goran Martić, Ugur Sahin

Around twenty percent of all cancer cases are contributed to infectious agents, mostly to viruses. However, detection of viruses can be laborious, time-consuming, or require foreknowledge. Next generation transcriptome sequencing (RNA-Seq) of human samples is unbiased in the way that all included mRNAs can be sequenced, including foreign mRNA like viral transcripts. The analysis of viral expression profiles and their influence on the host is fundamental to understanding virus-associated oncogenesis in human.

The software tool VirusID was developed for the qualified detection and identification of viruses in mammalian cells. VirusID was tested in benchmarks with known viral content and was slightly superior over other tools. It has since been in use for the identification of viral content in in-house and external sequencing RNA-Seq data at TRON and contributed to the TRON Cell Line Portal by delivering the identified viruses 1,082 cell lines.

Human papillomavirus 16 (HPV16) infection has been associated with a subgroup of Head and Neck Squamous Cell Carcinomas (HNSC), yet, the prognosis of HPV16 positive patients is still discussed in literature. We applied VirusID to HNSC RNA-Seq data provided by The Cancer Genome Atlas (TCGA) (n=402). With our method we confirm 92% of the virus typing results (in situ hybridization (ISH) or p16 typing) and extend the HPV16 typing of further 312 samples that were previously untyped (NAs). This increased the power to predict overall survival for HPV16-positive patients significantly.

This work shows the potential of screening existing RNA-Seq data for viruses. Apart from quality control of the sample by detecting potential contamination, prognostic value can be added by coupling the results with clinical annotation of cancer patients.

P11 (see S11)

Dr. Stefanie Wolters, Transferinitiative RLP, Focus ‚Personalized Medicine'

Title: "Transferinitiative RLP, Focus ‚Personalized Medicine'"

P12 (see T2)

Prof. Dr. Rüdiger Rudolf, Institut für Molekular- und Zellbiologie, Hochschule Mannheim

Title: "Project M²OGA - Solutions and digitalization in human organoid technology and tissue analytics"

P13

Peter Heger, Health Research Services

Title: "Safety of ERr 731® (Extract Rheum rhaponticum)"

Abstract: The safety data of the 12 weeks double-blind (DB) placebo-controlled (PC) randomized clinical trial (RCT) followed by a 52 weeks observational study (OS) have been presented as poster in July. Safety parameters that were investigated included endometrial biopsy, vaginal smear, mammography, and laboratory safety parameters, as well as AEs. No endometrial hyperplasia, no increase in breast density, breast tenderness, and no clinically relevant increase in liver enzymes and other safety parameters were observed in both DB and OS. This is in line with the data of a previous 12 weeks DB-PC-RCT followed by two 48 weeks observational studies (OS-I and OS-II) and another 6-months observational trial. The results of the trials confirmed ERr 731® to be safe in the acute and long-term treatment of climacteric symptoms in menopausal women. Other safety data will also be presented.

Health Research Services Ltd (www.h-r-s.biz) has conducted the clinical trials with ERr 731 (www.err731.com).

P14

Dr. Jan Gradel, Sino German Hi Tech Park

Title: "Gateway to Chinese - German cooperation."

Abstract: The Sino German Hi Tech Park is one of Germany's first joint Chinese and German science and technology parks. The park aims to combine internationally top ranked science centers both from Germany and China to form a unique international center for innovation and development.

The goal is to facilitate new technological developments and joint ventures for innovative high-tech companies, science driven startups and research institutes by offering office and laboratory spaces and all services needed to accelerate and promote their projects. Thereby building a gateway to Chinese and German cooperation and joint-ventures.

A first milestone of the Sino German Hi Tech Park project is the "Tech Tower" in Heidelberg Emmertsgrund. More than 7,000 sqm of office and IT spaces are combined with unique meeting and conference rooms to serve as incubator, accelerator and service center for high-tech companies and also for Chinese development zones. We plan to expand our service area to grow to over 60,000 sqm in the future as part of the Heidelberg Innovation Park in Patton Barracks.

To help our projects thrive we offer value added services providing insights and knowledge about Chinese and European markets as well as support from experts and industrial partners to optimize the development process. To enable steady and profitable progress we also provide venture capital services and support for projects planning to go overseas and get started in Chinese markets.

For more information please contact us directly or visit our website: www.sg-hitech-park.com

P15 (see S18)

Stefan Jungbluth, European Vaccine Initiative (EVI)

Title: European Vaccine Initiative (EVI)

P16

Prof. Dr. Matthias Rädle, Institute for Process Control and Innovative Energy Conversion (PI), Hochschule Mannheim

Title: "Multispectral Needle-Probe for Tissue-Analysis"

Authors: Frank Braun, Robert Schalk, Annabell Heintz, Marcel Nachtmann, Thomas Beuermann, Frank-Jürgen Methner, Bettina Kränzlin, Rudolf Frank, Norbert Gretz and Matthias Rädle

Abstract: This work demonstrates the application of a specially designed needle probe in an aqueous tissue model system in conjunction with a practicable algorithm for quantitative fluorescence measurements by means of correction of light scattering. The autoclavable Nitinol cannula can be applied to multispectral monitoring of ultraviolet (UV), visible (VIS), near infrared (NIR), Raman and fluorescence spectra. To correct the fluorescence emission the pure backscattering intensity is measured in a wavelength range where absorption and fluorescence effects are minimal. Moreover, the probing system can be combined with magnetic resonance imaging (MRI) which is demonstrated by a first proof-of-principle study including a room concept for the whole measurement setup.

P17

Prof. Dr. Matthias Rädle, Institute for Process Control and Innovative Energy Conversion (PI), Hochschule Mannheim

Title: "Non-invasive Raman process probe for in-line monitoring of *Saccharomyces cerevisiae* fermentations."

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Abstract: In this study, we demonstrate the applicability of a non-contact, large-aperture Raman probe for simultaneous real-time monitoring of carbon source glucose and product ethanol during batch fermentations of *Saccharomyces cerevisiae*. The data evaluation of Raman spectra was performed by simple multiple linear regression (MLR) models to simulate fictive Raman photometer setups instead of expensive spectrometer systems by limiting the spectral information to intensities in specific regions. The presented Raman probe has high potential for the use in industrial plants, as

it allows non-invasive in-line measurements through optical windows of bioreactors, chemical reactors, and optical inspection glasses of pipelines.

P18 (see S12)

Dr. Garrit Jentsch, BAST GmbH

Title: BAST: Model Based Drug Development

Startup Abstracts (SU)

SU1

Phagomed

50.000 people die from antibiotics-resistant infections every year in the EU and the US alone. Antibiotics are also often ineffective in biofilm-associated infections, leading to high recurrence rates and repeated antibiotics prescriptions. On top, antibiotics have many serious side effects and have been linked to chronic diseases (e.g. diabetes).
PhagoMed will accelerate the re-introduction of phage therapy as an alternative to antibiotics into Western medicine. Bacteriophages are viruses that infect and lyse specific bacteria. The efficacy and virtual absence of side effects with phage therapy has been demonstrated in 100 years of clinical application in Eastern Europe and a multitude of literature case applications in the West. However, due to the lack of investment into a robust development program, no pharmaceutical has been registered in Europe or the USA.
PhagoMed is building a platform to transfer excellent academic research projects into accelerated pre-clinical development. Ultimately, we aim to serially develop phage-based pharmaceuticals. Three such projects have been selected to form the initial pipeline, targeting Periprosthetic Infections, Urinary Tract Infections and Bacterial Vaginosis.
PhagoMed has entered collaborations with the world-renowned physicians and scientists leading these projects to further develop their proof-of-concept studies.
PhagoMed was founded by a team of seasoned medical and pharmaceutical experts, Prof. Dr. Burkhard Wippermann (one of the few clinicians in Germany who already treats patients with phages in extreme cases), Alexander Belcredi, Dr. Lorenzo Corsini and PD DDr. Jörg Schierholz, and is currently in the seed stage. We are seeking anchor investors who believe in the technology and the team, to invest starting this fall through milestone-based proceeds.

SU2

Lumobiotics GmbH

Cancer and antimicrobial resistance are top global health threats, causing enormous economic and social problems. Despite progress in targeted and personalized medicine, there are many cases where standard-of-care and novel treatments fail.

Lumobiotics addresses this problem by developing **a safer and more efficient targeted therapy against solid tumors and localized multidrug resistant infections**.

Their peptide drug candidates combine

- ✓ antibody-like high target **selectivity**,
- ✓ **no** drug resistance due to unique mode of action,

✓ fast **accumulation** in the tumor/lesion with low off-target effects,

✓ **lower** expected development **cost** translating into **higher** commercial **potential**.

Precise on-target activation is enabled by the ON | OFF (reversible) bioactivity photoswitch embedded in the drug molecules, **patented** in EU and USA. The drug is administered in deactivated form, then activated by **safe light** only at the site of lesion, avoiding off-target effects.

Current focus is on pancreatic and prostate cancers, and multiresistant infections, with estimated annual market size of 4bn, 10bn and 16bn EUR respectively.

Lumobiotics team combines **over 30 years of leadership experience in science and business**, in addition to a strong network of advisors and partners. Research has been performed by academia in four countries, financed by Alexander von Humboldt Foundation, Helmholtz Association, DFG and **EU Horizon2020**.

In addition to grants, **a seed investment was raised** in April 2017. Now seeking further financing for GLP preclinicals and Phase I clinical trials in EU.

Web Address: www.lumobiotics.com

SU3

300MICRONS

Polymer film based microcavity arrays (STATARRAYS©, DYNARRAYS©): a novel 3D cell culture platform technology

300MICRONS GmbH has developed a proprietary technology that is able to shape polymer films into nearly any desired shape. By this the gap between 3D cell culture and high-throughput-/high-content-screening can be closed. Whereas current technologies rely on aggregation of cells in one platform and the transfer to a second one for analysis, which is time consuming and costly, the 300MICRONS microtiter plates with integrated microcavity arrays (STATARRAYS©) allows the generation and downstream analysis in the same platform. Moreover, the STATARRAYS© dramatically increase the number of cellular aggregates/spheroids/organoids which substantially decrease the costs per aggregate in screening applications. Compared to current 96 or 384 well plates STATARRAYS© provide 169 and 43 times more spheroids, respectively. In addition, a fixed position of the aggregates is provided making them an ideal platform for automated 4D microscopy applications (3D over time).

Besides the integration of microcavity arrays in standard laboratory consumables, 300MICRONS is able to provide customized solutions due to the flexibility in geometry and material choice. By this, 300MICRONS is able to function as an OEM manufacturer.

Web Address: www.300microns.com

SU4

LIME medical GmbH

Every year in Germany there are around 280.000 work-related hand injuries that are subject to registration, 130.000 additional hand surgeries that are not caused by workplace accidents and 200.000 stroke patients with a hemiparesis and thereby signs of paralysis around the hand.

Due to the mismatch in therapeutic possibilities and work-intensive rehabilitation, the results of such treatments get worse and worse. Patients have to accept restrictions in their jobs or even have to retire early, which has far-reaching sociological and economic consequences.

The startup LIME is working on a compact and easy-to-use finger rehabilitation robot to intensify patients therapy.

Web Address: www.lime-medical.de

The Life Science Cluster Rhine-Neckar

www.biorn.org