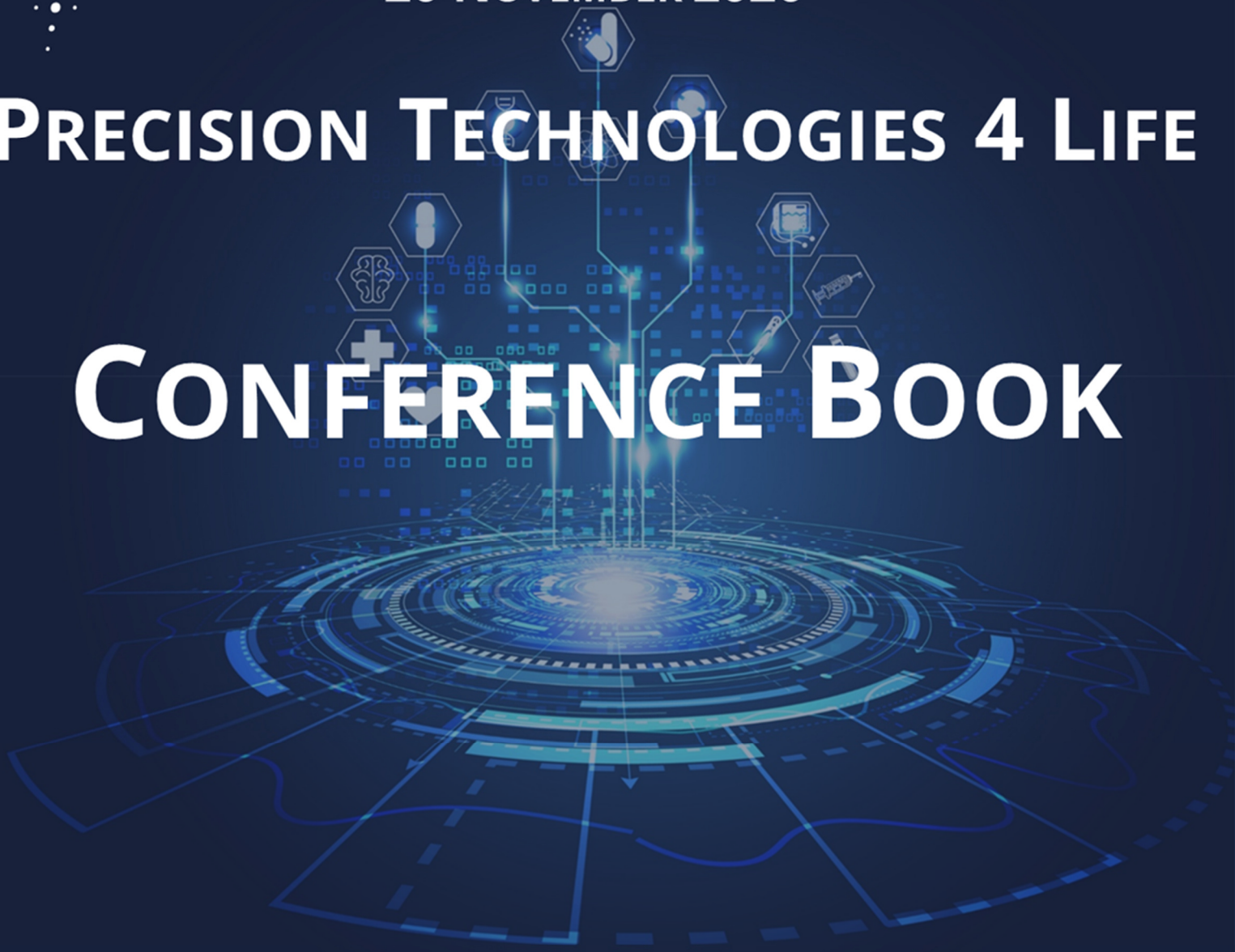
BioRN Annual Conference 2020

20 November 2020

Precision Technologies 4 Life



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09:15 – 10:30	Session 1: Molecular profiling of diseases

Keynote - "Novel approaches to biomarker discovery towards precision medicine in Oncology" - Vittoria Zinzalla, Head of Oncology Translational Science, Boehringer Ingelheim

"Identification of novel treatment options for gastrointestinal cancer patients with drug screening and patient derived organoids " - Johannes Betge, Junior Group Leader, Translational Gastrointestinal Oncology, University Hospital Mannheim, Medical Faculty Mannheim, Heidelberg University & German Cancer Research Center (DKFZ)

“Harnessing Immune Responses from Blood for Early Stage Disease Detection” - Rastislav Horos, Director Assay Development & Lab Services, Hummingbird Diagnostics GmbH , Heidelberg

"A vaccine to block Fentanyl overdose" - Nina Papavasiliou, Head of Division of Immune Diversity , German Cancer Research Center, Heidelberg

10:30 – 11:30	*1:1 meetings* I *Meet the speakers* I *Posters*

11:30 – 12:30	Session 2: Engineering new sensors to probe biology

Keynote - "Fluorescent and Bioluminescent Sensor Proteins" - Kai Johnsson, Director Max Planck Institute for Medical Research, Heidelberg

"mitoWEAR: Monitoring of mitochondrial disorders using wearable activity monitors" - Benedikt Rauscher, Systems genetics and precision health, EMBL, Heidelberg

"Nano- and Chromobodies: How to visualize and quantify proteins in living cells" - Ulrich Rothbauer, Head of Dept. Pharma and Biotech, NMI, Reutlingen

12:30 – 14:00	*1:1 meetings I Meet the speakers I Posters*
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Fireside Chat	**Johannes Frühauf,** Founder, CEO, LabCentral / Biolabs, Boston **Thomas Hanke,** Head of Academic Partnerships, Evotec, Hamburg **Jürgen Bauer,** Deputy Managing Director, EMBLEM Technology Transfer & Board Member, Heidelberg Startup Partners **Julia Schaft**, Managing Director, BioRN *Moderated by Siegfried Bialojan, BioRN Strategic Board Member & Executive Director, Head Life Science Center Ernst & Young GmbH*
15:30	Wrap-up & Closing Remarks
15:45 – 18:15	*1:1 meetings I Posters*

Welcome

Dear BioRN Members,

On behalf of the BioRN Cluster, we would like to welcome you all to the BioRN Annual Conference 2020.

Since 2009, each year the BioRN Annual Conference has been a valuable source of top information, lively discussions, and networking opportunities. With the same valuable content and the possibility to set up 1:1 meetings with other participants, this year's digital version of BioRN Annual Conference continues to help you strengthen your connections within the network.

With the title "Precision Technologies 4 Life", the conference features disruptive innovations for personalized medicine through molecular engineering and molecular profiling of diseases. High-sensitive sensors, nano-devices and other technologies allow the continuous acquisition and analysis of individual health data, allowing detailed molecular examination and identification of biomarkers.

A big 'Thank You' goes of course to all speakers, who accepted our invitation to share their exciting research and are at the heart of the meeting.

The same 'Thank You' to the excellent panellists that accepted to join the Fireside Chat on the "Innovation potential in the BioRN region" to illustrate the range of ongoing translational initiatives towards an entrepreneurial ecosystem that can compete with other centers of excellence on an international level.

We also would like to thank our sponsors for their dedication and financial support which allowed us to organize an outstanding program.

But now: let's enjoy the BioRN Annual Conference 2020 and its great networking opportunities – and do let us know what you would like to see at an Annual Conference next year – a conference by BioRN members for BioRN members!

Gitte Neubauer	**Michael Boutros**	**Julia Schaft**
Chair	Chair	Managing Director
BioRN	BioRN	BioRN

Moderation

Julia Schaft

Managing Director
BioRN Network e.V., Germany

After completing her PhD in molecular and developmental biology at the University of Giessen and the European Molecular Biology Laboratory in Heidelberg (Germany) in 2002, Julia continued her scientific research on the differentiation of human embryonic stem cells at Genea Ltd in Sydney Australia, an IVF clinic with a strong focus on research and innovation in the IVF and human stem cell field. Julia then took over leadership responsibilities in scientific project management and the supervision of all of Genea's embryo research licences. In 2014 Julia relocated back to Germany and took on an administrative role at the European Molecular Biology Laboratory in Heidelberg (Germany) building up the philanthropic fundraising program, the Friends of EMBL. She then joined BioRN as a project manager for international R&D and translational initiatives in the life sciences sector. Since October 2018 Julia is Managing Director of BioRN where she is also taking on BioRN strategic business development and partnering responsibilities.

Welcome and Wrap-up

Gitte Neubauer

Chair
BioRN Network e.V., Germany

Gitte Neubauer is a scientific founder of Cellzome. She graduated from Imperial College, London in Biochemistry and completed her PhD thesis with Matthias Mann at the European Molecular Biology Laboratory. After the acquisition of Cellzome by GSK in May 2012, Gitte Neubauer took over leadership of the company. She is Director of the Board of BioPro Baden-Württemberg, Director of the Board of the Centre for European Economic Research (Mannheim), a member of the industrial advisory board of the Biotechnology faculty of the University of Applied Sciences in Mannheim and member of the BioRN board since 2014 and chair of the BioRN executive board since 2018.

Michael Boutros

Vice Chair
BioRN Network e.V., Germany

Michael Boutros is the Head of the Division Signaling and Functional Genomics and Coordinator of the Functional and Structural Genomics Program at the German Cancer Research Center (DKFZ). He is also Professor for Cell and Molecular Biology at Heidelberg University. After his PhD at the European Molecular Biology Laboratory (EMBL), he joined Harvard Medical School in Boston as a postdoctoral fellow. In 2003, he started his independent group at the DKFZ in Heidelberg funded by an Emmy-Noether Grant of the German Research Foundation (DFG). He was also supported by the EMBO Young Investigator Program. He later became Head of Division and full Professor at Heidelberg University. Michael Boutros' research interests include functional genomic approaches to understand the regulation of cellular signaling in normal and cancer cells. His laboratory further develops and applies high-throughput screening and multi-omic data integration methodologies to dissect genetic networks and genotype-specific vulnerabilities in cancer. He is supported by the European Research Council (ERC) and is an elected member of the European Molecular Biology Organisation (EMBO). He is a member of the BioRN executive board since 2018.

A research-based biopharmaceutical company.

AbbVie is a global, research-based biopharmaceutical company. AbbVie's mission is to provide novel therapies for some of the world's most complex and serious diseases in the world, and to address the medical challenges of tomorrow. AbbVie wants to have a remarkable impact on people's lives and, with the acquisition of Allergan, is active world-wide in various important therapeutic areas like immunology, oncology, neurology, eye care, virology and women's health, in addition to medical aesthetics products and services from its Allergan Aesthetics portfolio.

AbbVie is represented in Germany with headquarters in Wiesbaden and a research and manufacturing site in Ludwigshafen, and with Allergan in Frankfurt. In total, AbbVie including Allergan has about 47,000 employees worldwide with about 2,800 of them in Germany. For more information on the company, please visit **www.abbvie.com** and **www.abbvie.de**. Follow **@abbvie_de** on Twitter or visit our LinkedIn pages.

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Speakers Session 1 – Molecular profiling of diseases

Keynote

Vittoria Zinzalla

Head of Oncology Translational Science, Boehringer Ingelheim RCV GmbH & Co KG

Vittoria Zinzalla PhD is an Italian cancer research scientist; she is currently Head of Oncology Translational Science at Boehringer Ingelheim, responsible for oncology biomarker discovery research to guide approaches towards personalised medicine. Vittoria was educated at the University of Milan, where she awarded a First Class Honours Master degree of Industrial Biotechnology and Biochemistry in 2003. She completed her PhD degree at the University of Milan in Cancer Cell Biology in 2006. Vittoria then moved away from basic cancer research to novel translational approaches focussed on drug development and biomarkers as part of her postdoctoral experience at the Biozentrum, University of Basel in Switzerland. Her research efforts were directed towards new therapeutic strategies targeting tumour signalling pathways and metabolism, working closely with the Novartis Institutes for BioMedical Research, and publishing her work in high-impact factor journals. In 2011, Vittoria joined Boehringer Ingelheim as research project leader, and then as scientific director in oncology research, leading to the discovery of patented clinical candidates targeting the Wnt signalling pathway and development of biomarker research. In 2019, Vittoria set-up the newly created global department of Oncology Translational Science. Vittoria and her team focus on identification and development of novel biomarker approaches for cancer cell targeted and immuno-therapies, with close interaction with cancer cell biologists, immunologists and oncologists.

Novel approaches to biomarker discovery towards precision medicine in Oncology

Precision medicine in oncology is a treatment paradigm that takes into account the molecular and cellular features of a tumour as well as those of its microenvironment and additional traits of the individual, such as genetics and lifestyle, to create a tailor-made treatment. Technological advancements in the molecular characterization of cancers have enabled researchers to identify an increasing number of key molecular drivers of cancer progression. These discoveries have led to multiple novel anticancer therapeutics, and clinical benefit in selected patient populations. We discuss strategies for the molecular characterization of cancers and the importance of biomarkers for the development of novel antitumor therapeutics. In particular, novel approaches such as digital pathology solutions, which allows for the acquisition of high-resolution, whole slide images and digital image analysis, and digital spatial profiling are presented. These approaches support the continuous need for identification of key histologic and molecular biomarkers via quantitative assessment that enables analyses of large datasets in a consistent manner, and are increasingly being used in biomarker discovery to drive the understanding of new therapeutic concepts and link to disease biology.

Johannes Betge

Junior Group Leader, Translational Gastrointestinal Oncology
Department of Medicine II, University Hospital Mannheim, Medical Faculty Mannheim, Heidelberg University. German Cancer Research Center, Signaling and Functional Genomcis, Heidelberg, Germany

I attended medical school in Graz (Austria) with clinical rotations in Cork (Ireland) and Kansas-City (Missouri). I subsequently worked my doctoral thesis on Wnt-signalling and oncogenes in colorectal cancer in the lab of Michael Boutros at the German Cancer Research Centre Heidelberg and obtained my doctoral degree from the University of Heidelberg in 2015. I started my training as a physician at the Department of Gastroenterology, University Hospital Mannheim in 2014, specializing in gastroenterology and gastrointestinal oncology, and I currently still practice there as a physician. I returned to the DKFZ as a Postdoc in 2016, focusing on ex vivo models of gastrointestinal cancers and high-throughput drug screening. Last year, I became junior group leader of translational gastrointestinal oncology at University Hospital Mannheim. My research is centred on the identification of better treatment options for patients with GI cancers using functional drug testing.

Identification of novel treatment options for gastrointestinal cancer patients with drug screening and patient derived organoids

Ex vivo models such as patient derived organoids retain the molecular and morphological characteristics of their origin and may thus allow functional analysis of individual tumors. We have developed a clinical and laboratory workflow for standardized generation of PDOs from endoscopic and fine-needle biopsies of different gastrointestinal tumors. To systematically measure drug response and morphological phenotypes of PDOs upon treatment with compounds, we have built a pipeline for image-based drug profiling of these 3D tumor models. Using these tools, we have analyzed phenotypic profiles of over 6 million individual organoids by confocal microscopy and unsupervised machine learning after treatment with more than 500 small molecules. Studying organoid phenotypes, we were able to characterize compounds by mode of action, identify new mechanisms of compounds and link morphological changes induced by compounds to molecular processes by gene expression analyses. Drug testing in organoids also allows identification of individual response to drugs and thereby may help to guide individual treatments. We have designed clinical studies to analyze the utility of this approach for establishing new treatment options for cancer patients.

Rastislav Horos

Director Assay Development & Lab Services, Hummingbird Diagnostics GmbH

Originally trained as veterinary doctor, I obtained a PhD in human experimental haematology at the Erasmus MC in Rotterdam, the Netherlands. My post-doctoral works at EMBL Heidelberg was focused on the RNA-protein complexes biochemistry, followed by a staff scientist position involving studies on autophagy, metabolism and small RNAs. Since April 2020 I am heading the lab at the Hummingbird Diagnostics with the focus on NGS, small RNAs, assays development and biomarker discovery from liquid biopsies.

Harnessing Immune Responses from Blood for Early Stage Disease Detection

Despite an ever-growing arsenal of potential biomarkers for early cancer detection, few non-invasive tests have successfully translated into the clinic. The two main workhorses of liquid biopsy, circulating tumor DNA (ctDNA) and circulating tumor cells (CTCs), to date, have not produced sufficient sensitivity in early stage localized tumors when surgery could still be curative. Hummingbird Diagnostics (HBDx) has pioneered a systems approach by not just searching for tumor derived signals but also exploiting the immune system engaged with disease. To this end we have harnessed the power of immune cell derived small non-coding RNAs, master regulators of gene expression and thus surrogate markers of immune system function and activity. Beyond diagnostics, small RNA profiles have been identified for companion diagnostics or prognostic and monitoring purposes.

To unlock the potential of small RNAs, we have developed a sample-to-insight pipeline that starts with venous or capillary blood sampling with immediate point of care stabilization, followed by automated RNA extraction and in-house next-generation sequencing data generation. We employ orthogonal advanced qPCR validation before proprietary machine learning algorithms uncover disease specific signatures. To understand and overcome potentially confounding differential contributions of blood subpopulations, we have defined small RNA profiles from all relevant circulating blood cell types.

The company’s present focus lies on the early detection of lung cancer. Presently we are enrolling over 2500 patients from three major lung hospitals in Germany and four in Boston. Through collaboration we are also engaged in other disease areas such as neurodegeneration where we have an ADDF-funded program on the early detection of Alzheimer’s disease.

F Nina Papavasiliou

Professor/Head of Division, German Cancer Research Center, Division of Immune Diversity, Heidelberg, Germany

September 1992 - July 1998	Rockefeller University (Ph.D. training; Mentor: Michel C. Nussensweig)
August 1998 - August 2001	Yale University (Postdoctoral training; Mentor: David G. Schatz
September 2001 – June 2007	Assistant Professor and Head, Laboratory of Lymphocyte Biology, Rockefeller University, New York
June 2007 – December 2016	Associate Professor and Head, Laboratory of Lymphocyte Biology, Rockefeller University, New York
September 2016 – current	Head of Division of Immune Diversity DKFZ, Heidelberg
April 2018 – current	Helmholz Professor, University of Heidelberg
June 2018 – current	Visiting Professor, Laboratory of Neuroendocrinology, Program in Neuroinflammation, Rockefeller University, New York

A vaccine to block Fentanyl overdose

Fentanyl is a synthetic opioid 100 times more potent than morphine. It has been the main cause of drug overdose in the US, with over 70,000 deaths in 2017. Medical interventions to prevent fentanyl overdose are desperately needed to combat this rise in fatalities. Just 2-3 mg of fentanyl can be lethal, causing sedation, vomiting, and respiratory depression. Overdose is more common for patients who relapse early in recovery, where abstinence upregulates endogenous opioid receptors and lowers tolerance. Fentanyl overdose is treated with mixed results by opioid blockers such as naloxone. Patient revival requires multiple doses, often not delivered in enough time. Prophylactic approaches, such as vaccines (ideally) or passive immunotherapy through long lasting mAbs, would be desirable interventions.

At the DKFZ, we have developed a novel platform to generate antibodies to prevent fentanyl overdose via active immunization (vaccination), and here I'll describe the platform and how it differs from other antibody elicitation approaches.

Speakers Session 2 – Engineering new sensors to probe biology

Keynote

Kai Johnsson

Director, Max Planck Institute for Medical Research, Heidelberg Germany & Professor Institute of Chemical Sciences and Engineering EPFL Lausanne, Switzerland

2005 – 2009	Associate Professor; Institute of Chemical Sciences and Engineering, EPFL Lausanne
1999 – 2005	Assistant Professor; Institute of Chemical Sciences and Engineering, EPFL Lausanne
1996 – 1999	Independent researcher; Ruhr-University Bochum, Germany
1993 – 1996	Postdoctoral fellow; Department of Chemistry, UC Berkeley, USA

AWARDS

2016 Karl Heinz Beckurts-Preis
2015 AbbVie Lecture, UC Berkeley
2013 Elected Member of EMBO
2012 – 2013 Novartis Lectureship Award
2012 Leica Scientific Forum Lectureship Japan (Osaka, Kyoto, Tokyo)
2011 Amgen Lecture, UC Berkeley
2003 Prix APLE for the invention of the year 2003 of EPFL Lausanne

Fluorescent and Bioluminescent Sensor Proteins

The topic of my presentation will be how a combination of protein engineering and synthetic chemistry can be exploited to generate fluorescent and bioluminescent probes for live-cell imaging and diagnostics.
Specifically, I will talk about our attempts to introduce a new class of fluorescent sensor proteins that permit to visualize drug and metabolite concentrations in living cells with high spatial and temporal resolution. I will also discuss how these sensor proteins can be utilized for point-of-care therapeutic drug monitoring.

Benedikt Rauscher

Postdoctoral Fellow, EMBL Heidelberg

2010 – 2015	University education (M.Sc.) in Bioinformatics at the Technical University Munich.
2015-2019	PhD research in cancer genetics at the German Cancer Research Center in the lab of Michael Boutros.
Since 2020	Postdoctoral Fellow in the lab of Lars Steinmetz at EMBL Heidelberg.

My research in the Steinmetz lab focuses on the functional characterization of disease associated genetic variants using genome editing and sequencing technologies. I am also interested in how wearable devices such as fitness trackers can be applied to improve personalized healthcare (topic of my talk at the conference).

mitoWEAR: Monitoring of mitochondrial disorders using wearable activity monitors

eHealth and the emergence of sophisticated devices for remote patient monitoring are paving the way to radically improve detection and treatment of disease, as well as promote wellness. A key hurdle for wider adoption of these devices, however, is a convincing demonstration of their reliability and utility. Mitochondrial disease patients frequently present with exercise intolerance that manifests after various periods of exertion. Exercise-related tests to measure these symptoms are notoriously difficult to perform in the clinic due to time constraints, variability of symptoms and influence from learned patient behaviors. mitoWEAR is a clinical study, where we provide a small cohort of mitochondrial disease patients with activity tracking devices to monitor daily exertion, day-to-day physiological variation and protracted response to exercise tests. Patient performance on established exercise tests will be benchmarked with clinical data to establish the validity of recorded activity measurements for diagnosing mitochondrial diseases. Both test-specific and daily activity measures will be correlated with additional factors, including type, etiology, severity and progression of the mitochondrial disease. Our goal is to determine whether fitness measures are accurate enough for clinically relevant classifications, and whether they can be used to accurately capture exercise intolerance symptoms that are difficult to measure in the clinic. The successful completion of this study can initiate a transformation in the way mitochondrial diseases are diagnosed and monitored in the clinic but will also set a precedent for other diagnostic studies employing wearable devices.

Ulrich Rothbauer

Professor, Natural and Medical Sciences Institute at the University of Tuebingen (NMI).

Ulrich Rothbauer is Professor for pharmaceutical Biotechnology at the University of Tuebingen and Head of the Pharma and Biotechnology Department of the Natural and Medical Sciences Institute at the University of Tuebingen (NMI). He received his PhD at Ludwig-Maximilians University (LMU), Munich, in the group of Prof. Dr. Walter Neupert revealing the pathomechanism of a mitochondrial disease. He started his work on nanobodies in 2004 as a postdoc in the lab of Prof. Dr. Heinrich Leonhardt at the LMU Biocenter. In 2006 he became an independent GO-Bio group leader focusing on the development of nanobody-derived tools for protein purification, proteomics and cellular diagnostics. 2008 he founded the Biotech company ChromoTek, which becomes the leading provider of innovative research reagents and technologies based on the nano-/chromobody-technology.

Nano- and Chromobodies: How to visualize and quantify proteins in living cells.

There is a continual need in biomedical research for reliable binding molecules that recognize cellular targets with high affinity and specificity. Single-domain antibodies - referred to as nanobodies - have emerged as an attractive alternative to conventional antibodies and became highly valuable tools in proteomics and cell biological applications. Recently we have identified novel nanobodies for protein purification, protein-protein interaction analysis and super resolution microscopy.

For in cellulo studies we developed a novel format of intracellular functional nanobodies (chromobodies) to target and trace endogenous components in living cells. In combination with high-throughput microscopy and automated image analysis we applied chromobodies as intracellular nanoprobes for phenotypic screening and high-content imaging (HCI) in real time. Based on the phenomenon that chromobodies are stabilized in the presence of their antigen we developed a novel chromobody format which monitors and quantify changes of endogenous protein concentration in living cells.

Due to their extraordinary properties nano- and chromobodies are versatile binding molecules offering an unique opportunity to combine biochemical, microscopic and functional analyses of cellular targets in flexible settings.

Fireside Chat – Innovation potential in the BioRN Region

The Rhine-Main-Neckar region around Heidelberg is one of Germany's strongest biotech hubs. It is internationally recognized as an academic center of excellence in the field of cancer, immunology, cutting edge imaging and omics, holding an enormous potential for translation into health applications.
By leveraging the unique combination of global pharma and leading academic institutions amongst its members, BioRN is driving a range of translational initiatives to create an entrepreneurial ecosystem that can compete with other centers of excellence on an international level.
During this session, we will address challenges to transfer academic innovation into drug discovery and other applications, by staging potential solutions to bridge the so-called 'valley of death'.
The Evotec Rhine-Main-Neckar BRIDGE is a new risk-shared pre-seed project incubation paradigm to accelerate preclinical development by matching novel academic therapeutic approaches with both financial investment as well as Evotec's broad and deep technical drug discovery expertise.
BioLabs is a membership-based network of shared laboratory facilities located in key geographies with proven biotech innovation clusters. BioLabs offers beautifully designed coworking environments that pair fully equipped and supported labs, offices, and event spaces with relevant programming and unparalleled access to capital and industry partners. These fertile, supportive ecosystems allow young companies to shift their focus from startup operations to experimentation and innovation.
The Fireside Chat is led by Siegfried Bialojan, BioRN Strategic Board Member & Executive Director, Head Life Science Center Ernst & Young GmbH

Julia Schaft

Managing Director
BioRN Network e.V., Germany

After completing her PhD in molecular and developmental biology at the University of Giessen and the European Molecular Biology Laboratory in Heidelberg (Germany) in 2002, Julia continued her scientific research on the differentiation of human embryonic stem cells at Genea Ltd in Sydney Australia, an IVF clinic with a strong focus on research and innovation in the IVF and human stem cell field. Julia then took over leadership responsibilities in scientific project management and the supervision of all of Genea's embryo research licences. In 2014 Julia relocated back to Germany and took on an administrative role at the European Molecular Biology Laboratory in Heidelberg (Germany) building up the philanthropic fundraising program, the Friends of EMBL. She then joined BioRN as a project manager for international R&D and translational initiatives in the life sciences sector. Since October 2018 Julia is Managing Director of BioRN where she is also taking on BioRN strategic business development and partnering responsibilities.

Johannes Frühauf

Founder and President
BioLabs and LabCentral

Johannes Fruehauf (MD PhD) has a background as a physician working in diverse health systems. In his 15+ years as a serial biotech entrepreneur, Dr. Fruehauf has dedicated much of his professional endeavors to the mission of re-defining life science entrepreneurship and building start-up ecosystems.
He is the Founder and President of LabCentral, the preeminent private/public partnership model for life science incubator space, while also serving as CEO for BioLabs, the largest provider of laboratory co-working space for startups nationwide. LabCentral and Biolabs currently are home for over 300 startups in 8 cities and companies started within this network now routinely account for over 20% of all Seed and Series A venture capital invested in life sciences in the US. Johannes is founder and General Partner of Mission BioCapital (MBC). In his role at MBC, he sources, diligences, and leads new life-science investment transactions and represents the fund on the board of a number of MBC portfolio companies.
Dr. Fruehauf studied medicine in Germany and France, while also conducting field work in Africa (Zimbabwe and Guinea). He graduated from University of Frankfurt and received his doctorate from the University of Heidelberg. Johannes is the author of over 30 peer reviewed publications and is named inventor on 9 patents.

Thomas Hanke

Executive Vice President, Head of Academic Partnerships
Evotec SE

At Evotec, Thomas is responsible for a growing portfolio of strategic academic partnerships, pre-seed incubators and investments into spin-out companies.
From 2013 to 2016, Thomas was overseeing Evotec's drug discovery portfolio in inflammation and immuno-oncology, generating and building on high-value, performance based alliances with academia and pharma. From 2007 to 2013, Thomas was Sourcing Director at the Biopharmaceuticals Research Unit of Novo Nordisk where he identified, evaluated and initiated global partnering opportunities for first-in-class therapeutics within haemophilia, autoimmune/inflammatory diseases, growth disorders and protein technologies. From 2000 to 2007, Thomas was co-founder and Chief Scientific Officer of TeGenero, heading its R&D efforts to develop first-in-class immunomodulatory monoclonal antibodies. Until 2000, Thomas was group leader and Assistant Professor for Immunobiology at the University of Würzburg following a PostDoc at the University of California in Berkeley where he studied the immune response of lymphocytes. Thomas received his Ph.D. in Biology from the University of Würzburg in 1995.

Today, Thomas has 25+ years of experience in research and drug discovery across academia, biotech and pharma. Fostering innovation and continuous improvement, Thomas manages cross-functional teams as an assessor / developer, sets directions and builds trust in companies.

Jürgen Bauer

Deputy Managing Director, EMBLEM Technology Transfer GmbH
Board Member, Heidelberg Startup partners

Dr. Bauer is a graduate of Johann Wolfgang Goethe University in Frankfurt (Biology) and holds a Ph.D. in Molecular Biology.
After spending four years as a research scientist at the Nestlé Research Center in Lausanne, Dr. Bauer joined the R&D Center of Lesaffre International, the world leader in the baker's yeast market, where he was Head of the Molecular Biology and Genetics Team. In 2000 he joined Axaron Bioscience AG in Heidelberg, a joint venture of BASF and Lynx Therapeutics from where he moved on to Gentana GmbH, a biotech company providing gene expression analysis services based on its proprietary technology platform.
After acting as CEO of Gentana for two years, Dr. Bauer joined EMBL Enterprise Management Technology Transfer GmbH, a 100% subsidiary of the European Molecular Biology Laboratory as Business Development Manager. As of May 2011, he is appointed as Deputy Managing Director of EMBLEM and responsible for Business Development.
Dr. Bauer is alumnus of the Chemical Industry Fund within the German Chemical Industry Association and the St. Gallen Business School. He serves as board member of different companies, associations and consortia.

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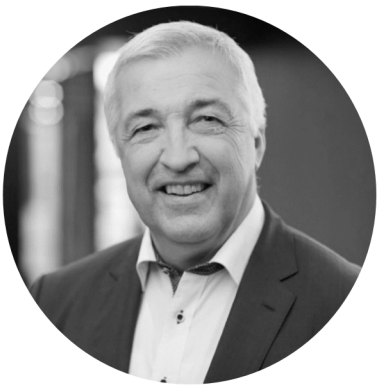

Siegfried Bialojan

Executive Director, Life Science Center, Mannheim, Ernst & Young GmbH & BioRN Strategic Board Member

Dr. Siegfried Bialojan studied Biology and Human Medicine at the University of Heidelberg. He received his PhD in Molecular Genetics. After a Post-Doc-period at the German Cancer Center in Heidelberg (1985-1987; focus on cell biology) he joint the pharmaceutical industry and worked for 14 years in various R&D functions at BASF Pharma/Knoll, Abbott. In 2001 he joined EY to establish their Life Science Practice. He built EY´s global Life Science database and was responsible for global data collection and industry knowledge feeding into EY global Thought Leadership publications. Today he is a

Director at the EY Life Science Center Mannheim and is responsible for coordination of activities in the biotech subsector at EY Germany. In this role he also authors the annual German EY biotech report series and supports advisory projects in the Life Science sector with his industry expertise.

Industry Poster Gallery

Digital posters are displayed under "Marketplace" once you are registered for the conference.

Navigate through the posters and set up 1:1 meeting with the poster presenter(s).

New support for preclinical R&D teams with in-vivo analytic services based on advanced Xray Fluorescence Imaging

Marc Jopek
axiom insights GmbH (www.axiom-insights.com)

axiom insights offers a highly sensitive imaging technology without depth restriction – a sophisticated and patented method based on X-ray Fluorescence Imaging (XFI) that opens up completely new possibilities:

- It allows to reduce significantly the development costs and time spent on research
- axiom's new measurement method enables to assess the investment risk of a new product significantly better throughout the entire development phase.
- axiom's XFI method increases the probability of pharmaceutical products being approved substantially faster by Regulatory Authorities

The approach provides direct support of preclinical research processes. It allows to directly track your medical drug molecules, drug carriers or immune cells over time in vivo and without any depth limitations. This also allows obtaining new data at different points in time on the population dynamics of the tracked immune cells and visualize this information directly.

This enables to quickly check the efficacy and safety of pipeline products at all stages of the development process. axiom's analyses can also be used to examine interesting product candidates independently of available data in case of an acquisition or licensing.

BIOFLOATTM – A new technology for perfect cell spheroids - rapid, reliable, reproducible-

Annamarija Raic, Anett Ullrich, Nadine Kaiser, Tobias Mentzel, Véronique Schwartz
Chemovator GmbH (www.chemovator.com), www.facellitate.com a venture of Chemovator GmbH

The usage of in vitro model systems in medical and pharmaceutical research is becoming more and more important since institutions are encouraged to reduce animal studies. The most of current model systems are still based on unnatural 2D cell cultures – cells grown on plastic surfaces. Nowadays, 3D spheroid cultures – cells in aggregates - increasingly call the interest of scientists due to their potential to mimic the in vivo environment by forcing cell-cell contacts. However, such spheroids are currently grown on plates coated with animal-derived mixtures or synthetic coatings which suffer due to the lack of reproducibility and ease of use. For this purpose, we developed a chemically defined, xeno-free coating solution which can be easily applied to create a robust and homogeneous coating by simply rinsing the culture surface of choice for a few seconds. The coating is biologically inert and prevents nonspecific binding of proteins and cells but can be modified with specific bio-signaling ligands. We benchmarked our new technology using different cell lines such as hepatocytes showing a reproducible, rapid generation of round spheroids within 24 h outperforming current competitors. This new technology allows the development of spheroid-based model systems within a remarkable short time for pharmaceutical as well as medical research.

The European Vaccine Initiative “Developing vaccines for global health”

Nicola K. Viebig, Catarina Luis, Stefan Jungbluth, Hilde Depraetere, Ole Olesen
European Vaccine Initiative (EVI) (www.euvaccine.eu)

The European Vaccine Initiative (EVI) is a non-profit organisation with the goal to support and accelerate the development of effective, accessible, and affordable vaccines for global health by bridging conceptual and operational gaps in translational research.

Through collaborations with academia, industry, other product development partnerships (PDPs), policy makers and donors, EVI is managing a project and vaccine portfolio that comprises candidate products for malaria, leishmaniasis, diarrhoeal infections and emerging infectious diseases. EVI further supports strengthening of the vaccine R&D infrastructure in Europe, harmonization, knowledge sharing, and aligning of major vaccine R&D stakeholders. With its expertise in clinical research and product development, EVI supports its partners in conducting clinical research at international standards. Since its inception in 1998 EVI has contributed to the development and clinical assessment of over 30 vaccine preparations. EVI is also instrumental in the strengthening of capacity in clinical research in low- and middle-income countries, particularly in sub-Saharan Africa. Moreover, EVI provides regulatory consultancy as well as strategic connections with key policy makers and stakeholders supporting the translation of the results into policy. Due to its expertise and global network, EVI is uniquely placed to support the development of essential vaccines not only within the Rhein-Neckar cluster but worldwide.

Highly Sensitive RNA-FISH Probes for SARS-Covid-2 Detection and Quantification.

Winfried Busch, Thorsten Belz
MetaSystems Hard & Software GmbH and MetaSystems Probes (www.metasystems-probes.com)

With XRNA, we introduce a new generation of RNA-FISH probes that are ideally suited for gene expression studies down to the cellular and molecular level. The initial product portfolio includes three newly designed SARS-Covid-2 probes. The XRNA SARS-CoV-2 probe comprises a set of 96 oligonucleotides that detect the spike glycoprotein mRNA of SARS-CoV-2 and a portion of ORF1 next to the spike gene. This probe can be used to specifically detect SARS-CoV-2 in fixed tissue samples, infected host cells, or spike-protein-expressing cell lines.

XRNA ACE2 and TMPRSS2 allow assessment of transcription levels of the human ACE2 receptor, facilitating virus attachment to the host cell and TMPRSS2, a cellular protease, enabling fusion of host- and virus membrane.

Detection and quantification are enabled by our fully automated Metafer imaging platform. The system performs image acquisition and analysis of labelled cells and tissue samples, yielding an unbiased and quantitative result. This unique probe / system combination will support laboratories in a broad range of investigations on the effects of SARS-Covid-2 as for example on cell response to the infection like molecular cell expression or apoptosis, or - another example – for prospective studies on patient follow-ups (e.g. when is a recovered patient really no longer infective).

Precision to achieve data integrity – EQIPD QS, a systematic approach to enhance data quality

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Drug development success rate has declined over the past decade. One factor that is thought to contribute to the high rate of preclinical-to-clinical translation failures is the absence of robustness of preclinical evidence.
To address these concerns, a quality system (QS) was developed by a private-public consortium called EQIPD (Enhancing Quality In Preclinical Data) under the umbrella of the Innovative Medicine Initiative. A total of 29 consortium partners have designed a QS dedicated for research units combining the needs for an effective and lean approach.
The basis of the EQIPD QS consists of 18 Core Requirements defining best practices for any research environment and includes aspects like quality culture, data integrity, research process and continuous improvement. In case the research data shall be used to make a formal knowledge claim, meaning that the data shall be utilized beyond exploratory research, six additional requirements apply, for example blinding and randomisation. Additionally, the consortium has developed several tools for easy implementation of the QS. Utlimatley, a research unit can get certified to acknowledge the successful adaptation.
For research units and stakeholders interested in the data integrity and quality independent of the implemented QS, a purpose-fit assessment was developed to allow judging the data integrity.
The EQIPD QS is currently applied at research labs within the consortium and at other interested labs.

Profiling of epitope-specific antibody responses and biomarker discovery in viral and parasite infections utilizing high-density peptide arrays

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Introduction

Highly sensitive diagnostic tests and the identification of targets for the development of preventive measures are fundamental to fight against infections. The significance of humoral responses is multi-facetted. Antibodies do not only play an important role in combating a wide range of infectious diseases but can also be utilized for serology. Hence, a comprehensive analysis of humoral responses will ultimately result in the identification of novel target antigens of protective immune responses and disease-specific biomarkers for the development of innovative serological tests.

Objectives

The precise knowledge of antigenic properties of proteins and their underlying epitopes could be a rich source for comprehensive diagnostic markers and novel vaccines. Relating to HEV this could be the basis for an innovative, multiplex serological assay with a higher sensitivity and specificity. Antibody-mediated defense mechanisms play an important role in combating malaria infection, however, the entire picture of the antigenic targets is still elusive.

Materials & Methods

High-density peptide arrays can display large numbers of antigen proteins translated into overlapping peptides. Antibody responses to linear and conformational epitopes can be analyzed in a high-throughput mode yielding high and low immunogenic specific epitopes.

Result

As examples we chose HEV and malaria to conduct extensive epitope mappings for antigen characterization and biomarker discovery. In case of malaria, we analyzed the antibody responses of individuals from malaria-endemic areas and from malaria-naïve European individuals. The results show distinct antibody patterns according to immune status of infected individuals.

In our HEV screenings, we identified common immunogenic regions in patients that clearly discriminate between infected and non-infected individuals. The corresponding peptide epitopes can potentially serve as starting points for peptide based diagnostic tests.

Conclusion

In conclusion, high content peptide microarrays are an ideal tool for the comprehensive identification of epitope-based biomarkers for infectious diseases such as HEV or malaria. The discovery of novel linear or conformational epitopes can lead to the development of innovative multiplex serological assays and identify novel vaccine candidates.

The effect of saturated phospholipids on human skin assessed with shotgun lipidomic analysis.

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The purpose of the study was to investigate the penetration properties of a hydrogenated phospholipid based dermal formulation using the Lipotype shotgun lipidomics technology. A special focus was placed on the detection of characteristic PLs of the applied formulation,

especially phosphatidylcholine (PC), and the distinction from endogenous lipids in human skin. The study successfully confirmed that hydrogenated PLs penetrate into the Stratum Corneum. A high amount in upper skin layers and a decrease in deeper layers demonstrate an accumulation of saturated PC in upper epidermal layers.. For the first time the detection of exogenous PLs besides endogenous skin lipids was demonstrated using the Lipotype shotgun lipidomics technology. It offers the opportunity for further investigations and will be used to assess the penetration properties as well as metabolism of (un)saturated PLs. The observed skin distribution pattern was in agreement with the findings of Blume (SÖFW Journal 2000, 126) and can be used to support the skin barrier function or to influence the distribution of a co-formulated drug substance in the skin.

Improving Multiple Myeloma Treatment Selection with Single Cell Multi-Omics Precision Medicine Tool

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Multiple myeloma (MM) is an incurable blood cancer, which constantly relapses due to tumor heterogeneity; different tumor clones respond differently to treatments and cells not killed by a therapy will later expand. After relapse, MM therapy selection depends highly on the experience of the clinician and no objective tests are available to predict the potential efficacy of a treatment regime. Precision medicine holds the promise of tailoring treatment for individual cases. However, it has usually relied on bulk sample analysis, where minority cell types are underrepresented and often missed. These are exactly the cell populations that lead to disease recurrence or therapy resistance.

Proteona developed ESCAPE™, the single cell multi-omics analysis platform tool, for assisting MM treatment decision making. It measures the protein and RNA expression in MM patient samples on the single cell level. From each cell, Proteona is able to extract thousands of data points and these data are compared to a proprietary database of tumor cells with known treatment outcomes. The information is used to automatically identify the cancer cell subtypes present and recommend which therapy option is best to kill those specific tumor cells. By analyzing each patient sample at the single cell level, we are able to identify how unique clones may behave and recommend therapy adjustment, enabling the patient to delay or entirely avoid an additional relapse.

Identification of new Biomarker Signatures for Neurodegenerative Diseases

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Sciomics GmbH (www.sciomics.de) [1]
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We have investigated Cerebrospinal fluid (CSF) and plasma samples from Alzheimer Disease (AD), Parkinson Disease (PD) as well as Multiple Sclerosis (MS) patients and compared the protein expression profile to samples from healthy humans in order to identify new biomarker signatures.

In contrast to other areas of medicine diagnosis of neurodegenerative disease is still lacking reliable fluid biomarkers, especially since now new disease modifying therapies are in clinical development. New biomarkers should increase the diagnostic accuracy and be allow earlier diagnosis, better participant selection and disease activity and treatment effect monitoring.

Antibody Microarrays for immuno-based protein biomarker detection developed by Sciomics cover key pathway proteins as well as secreted proteins. With a sample consumption of less than 100 µL a spectrum of about 1300 proteins is detected covering signalling pathway proteins, transcription factors, apoptosis marker, markers for oxidative stress, cell surface markers and cytokines.

Proteins showing different abundance between AD, MS and PD compared to controls were identified in both body fluids. In AD patients compared to control subjects 108 differential proteins were identified in CSF samples whereas 21 proteins were differential between AD and control subjects in plasma samples with some proteins showing an overlap between the two body fluids.

This will be verified in a larger cohort with special focus on proteins significantly changed on both matrices or proteins contributing to selected biological functions.

The comparison of CSF and plasma protein expression patterns allow a conclusion on the capability to identify pathways affected by the disease in the same way in both body fluids. This may guide the search for new blood-based biomarkers for neurodegenerative disease.

Introducing VectorBuilder's optimized Adeno-associated virus (AAV), shRNA lentiviral and pseudotyped S-protein (Covid-19) virus packaging services

Justin Mirus
VectorBuilder (www.VectorBuilder.com)

As the world's leading provider of vector construction and virus packaging services, VectorBuilder constantly strives to optimize its backbones and pipelines. Here we showcase some of our optimized AAV and lentivirus packaging, which also includes our S protein pseudotyped lentivirus for SARS-CoV-2 research. Our AAV serotype panel enables you to screen different serotypes (up to 18) for you to identify the optimal one for in vitro use, something that has become more popular with AAV re-emerging in gene therapy studies. Similarly, our shRNA lentiviral services enable fast and cost-effective screening of candidate shRNA sequences. Lastly, we have achieved strong transduction of ACE2 and ACE2/TMPRSS2-expressing 293T cells following packaging optimization of our pseudotyped S protein lentivirus, thus enabling effective and safe study of Covid-19 infectivity.

About the Organiser

BioRN is the science and industry cluster of the Rhine-Main-Neckar region around Heidelberg, one of Germany's strongest biotech hubs. It is a non-profit network fostering health innovations and serving its members by creating a rich translational ecosystem as well as promoting, representing and connecting the regional innovation stakeholders.

Our vision is to develop the region into a world-leading life science cluster attracting international investments and top global talent.

BioRN has about 100 institutional members, including the top academic and research institutions, 7 global pharmaceutical companies, a large range of small and medium-sized enterprises bolstering the life science ecosystem as well as local government organizations and interest groups.

Founded in 1996 BioRN has since raised more than 70 million € of public funding for its members. It was instrumental in the successful bid for the European Institute of Technology (EIT) KIC Healthy Living and Ageing in 2014 with a total grant of 700 million €

BioRN Cluster management establishes initiatives to nurture and extend networks between its members - the key regional innovation stakeholders. It stands for the promotion and visibility of the Life Science region and fosters connections to other regions of innovation worldwide.

BioRN is founding member of the Health Axis Europe (HAE), a strategic alliance between the leading life science hubs of BioRN, Leuven (Belgium), Maastricht (Netherlands) and Copenhagen (Denmark). The alliance aims to bundle and cross leverage the members' innovation resources and thus jointly increase international competitiveness.

The cluster is internationally recognized as an academic center of excellence in the field of cancer, immunology, cutting edge imaging and omics, holding an enormous potential for translation into health applications. By leveraging the unique combination of global pharma and leading academic institutions amongst its members, BioRN drives a range of translational initiatives in order to create an entrepreneurial ecosystem that can compete with other centers of excellence on an international level. These initiatives include tailored technology scouting activities between industry and academia (Health Axis Europe Partnering – HAEP), paving the way towards a fully equipped and professionally run life science startup incubator (BioLabs HD), and the implementation of funding instruments to finance the conversion of academic projects into industry ready assets (HDDiscovery).

General Information

Social Media

We strongly encourage the use of social media in and around the conference.
Follow the conference on Twitter (@BioRNCluster) and use the hashtag #BAC2020 for this conference.
You are welcome to discuss the conference and what you are hearing and seeing, but please refrain from sharing raw data presented, as this may preclude subsequent publication of the data in a scholarly journal.

B2B Meetings

As an alternative to the classical vivid networking of previous BioRN Annual Conferences, you can schedule already on November 19, 1:1 meetings with other participants. In case you are having troubles please have a look here: https://biorn-annual-conference-2020.b2match.io/how-it-works.

Sketchideas

Katja Rejl and Sonja Skopp are passionate visual thinkers and business minds with more than 15 years corporate leadership experience. They strive to make complex stories short and enable meaningful discussions for enhanced collaboration and communication funneled by their creative ideas. With their small enterprise 'SketchIdeas' they are adding value to clients - capturing content in graphic recordings, consulting processes and strategies and connecting people by visual working. They can be reached under katja@sketchideas.net and sonja@sketchideas.net

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