Personalised medicine is currently at an inflection point. There’s been much discussion around genomics, AI and data, but we are now at a point where a number of factors are coming together to make it a reality. We found a great deal of interest in X-omics at last years’ event and the discussion around how we combine all of the omics data continues. The volume and variety of data, computing power and AI technology allow us to precisely discover and identify patient populations who will respond to a drug and deliver personalized therapies. What role can this data and AI play in drug discovery and, indeed even with all the incredible research, and tech, are there regulatory, financial, political or ethical barriers which hold us back? There is much ground to cover before we truly realise the potential of precision medicine.

As such, for 2019 we will have more speakers, covering more content, more opportunity to engage with your peers, showcases of novels technologies and so much more.

As the precision medicine movement takes a firmer grip, we will look at the latest data analysis technologies, how AI is transforming the way we think about therapies, the benefit of X-omics; how it is coming to the fore and becoming the norm for everyday methodology for researchers. We will uncover the issues surrounding regulation and what is being done to break down the barriers to nationwide adoption of a personalised approach to medicine.

We hope to see you in Utrecht for what promises to be an unrivalled forum for the region.

Speakers include:

Prof Dr Alain van Gool, Professor, Personalized Healthcare & Head, Translational Metabolic Laboratory, Radboud UMC

Frank Rademakers, Chief Medical Technology and Innovation Officer, University Hospitals Leuven, Belgium.

Oliver Gassner, Head Digital Health Intelligence EMEA, Bayer

Prof Dr Wouter de Laat, Group Leader, Hubrecht Institute, Principal Investigator, Oncode & Professor of Biomedical Genomics, University Medical Center, Utrecht

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Day One: Monday 13th May 2019

12.15
Registration and Lunch

13.00
Opening remarks from the Chair

13.10
Exploring the Future Direction of Precision Medicine: What We Hope to Achieve and Required Next Steps

A panel of expert speakers from across the Benelux region will share their views on what has been achieved to date in the implementation of precision medicine; where they believe it is heading in the near future; and where the focus needs to be in order to achieve key aims and objectives. Topics to be discussed include:
- Examining key advancements and enablers in the development and implementation of precision medicine
- Identifying the current legal, regulatory, societal and ethical obstacles restricting its further development
- Assessing how regulatory and healthcare frameworks in different countries need to adapt to overcome these obstacles and enable innovation and delivery:
  - what can be done to improve reimbursement pathways for precision medicine to encourage better collaboration between regulators and health technology and diagnostic test providers?

Panellists:
Prof Dr Marc Van Den Bulcke, Head of the Cancer Centre, Sciensano
Senior Representative, EBE-EFPIA Personalised Medicine Working Group

The presentations will be followed by an in-depth panel Q&A discussion; delegates are invited to ask questions and share their own views.

The Role of Molecular Pathology in Precision Medicine: Challenges and Possibilities
Prof Dr Ed Schuuring, Professor in Molecular Oncological Pathology, Senior Clinical Scientist in Molecular Pathology, University Medical Center Groningen

14.45
Leveraging Digital Data & Biomarkers to Enable Precision Medicine
Oliver Gassner, Head Digital Health Intelligence EMEA, Bayer

15.15
Refreshments & Networking

15.45
Interactive Sessions

These focused, interactive sessions give you the opportunity to discuss a key topic of interest to you in a more participative format. Each session will be led by a facilitator who will lead the discussion and encourage maximum debate and sharing of ideas.

A. Getting the Most Out of “Big Data”
B. Exploring the Potential Use of Blockchain-Based Data Sharing & Access to Improve the Quality of Clinical Research
C. Innovative Approaches to Clinical Trial Design
D. Best Practice Strategies for Successfully Implementing Precision Medicine into Clinical Practice

This list is not definitive at this stage. Additional topics will be added in due course. If you would be interested in facilitating a workshop, or have ideas for topics, please contact us.

17.15
Closing remarks from the Chair

17.30
Complimentary Networking Drinks Reception

Day Two: Tuesday 14th May 2019

08.30
Welcome Refreshments & Networking

9.00
Opening Remarks from the Chair

9.05
Keynote address: Advancing Personalised Medicine Across Europe: Priorities & Opportunities
Manuel Mateo Goyet, Cabinet Member of Mariya Gabriel, Commissioner for Digital Economy & Society, European Commission

9.30
Update on the Netherland X-Omics Initiative
Prof Dr Alain van Gool, Professor, Personalized Healthcare & Head, Translational Metabolic Laboratory, Radboud UMC

9.50
Physician’s Perspective: Using Precision Medicine Research in Practice for Patients’ Benefit

10.10
Q&A

10.25
Morning Refreshments & Networking

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The programme will now split into 2 tracks. Delegates are invited to choose the track they would like to attend.

**TRACK ONE
Leveraging the Power of “Big Data” in Precision Medicine**

One of the biggest challenges to advancing precision medicine is managing the huge volumes of data being created. Appropriate bioinformatic methods for managing, integrating, sharing and analysing complex biological data are required to enable reinforcement of commonalities, reduction of "noise" and identification of the right clinical result.

10.50 Data Sharing: Effectively Managing the Legal, Technical and Ethical Obstacles to Data Sharing
- Understanding actual vs perceived barriers to the sharing of genomic and health data
- Working with relevant stakeholders to influence and overcome these barriers
- Examining the extent to which the introduction of GDPR has impacted on the accessing and sharing of healthcare data, and how this can be managed
- Managing patient privacy and confidentiality concerns regarding healthcare data sharing
- Effectively linking patient e-health records and national data registers to establish a research database and facilitate shared decision-making
- Exploring the use and potential of blockchain-based data sharing and access

11.10 Data Integration: Overcoming the Challenges of Integrating Large Volumes of Complex Data from Heterogeneous Sources
- Exploring new methods for integrating genetic data that is from different sources, in different formats, processed in different ways:
  - Finding the meaningful overlap and reducing "noise"
  - Techniques for normalising the data
- Successfully integrating lifestyle and behavioural data with biological information
- Developing robust, transparent and standardised bioinformatic pipelines to provide timely and useful clinical information
- Using new data analysis tools to gain better insights from the information available
- Techniques for reporting the findings in a coherent way:
  - Encouraging closer interactions between bioinformaticians and clinicians for better clinical reporting

Prof. Dr. Ron HN van Schaik, Professor of Pharmacogenetics, Erasmus University Medical Center

11.30 Successfully Analysing & Interpreting Complex Omics Data to Make Sense of Biological Big Data
- Examining how data collected from different omics can correlate with, and be analysed alongside, each other
- Developing novel methods for multi-omics data integration to extract biologically relevant information:
  - How can different omics relate to the same group of patients?
  - Techniques for effectively integrating all omics layers into clinical trial design

Dr Clara van Karnebeek, Principal Investigator, Departments of Paediatrics and Clinical Genetics, Emma Children’s Hospital, Academic Medical Centre, Amsterdam

**TRACK TWO
Biomarker Development & Diagnostics**

A recognised bottleneck in the advancement of precision medicine is the identification, development and validation of appropriate predictive biomarkers. These are a vital tool to provide the link between research, clinical trials and implementation. This session will look at the future development of biomarkers, how their use in clinical practice can be improved and facilitated, as well as emerging diagnostic techniques for better disease prediction and prognosis.

10.50 Accelerating Biomarker Discovery & Validation for Use in Clinical Trials
- Identifying the key challenges to biomarker validation and how to overcome these:
  - Determining pathways that will lead to better validation
  - Changing the role and requirements of biomarkers in the design and implementation of clinical trials
- Examining the use of patient involvement in biomarker development
- Analysing the economics of biomarker development – who should pay and how can the value proposition be increased?
- Techniques to enhance and accelerate biomarker discovery and validation processes to improve their effective transition into clinical use

11.10 Developing Pharmacogenomic Biomarkers for Personalised Drug Therapy

Prof. Dr. Ron HN van Schaik, Professor of Pharmacogenetics, Erasmus University Medical Center

11.30 Developing the Use of Mass Spectrometry as a Diagnostic Tool for Translating Molecular Insights into Clinical Solutions

11.50 Developing Diagnostic Technologies for Clinical Application: Robust NGS-based Translocation Detection in FFPE Tumour Samples

Chromosomal translocations are long known as drivers of leukemia, but are more recently also found as key oncogenic events in solid tumours. Consequently, such tumours are now also routinely analyzed in the clinic for the presence of these translocations. For example, translocation identification in non-small cell lung carcinomas (NSCLC) is essential to select the optimal treatment and is obligatory for the thousands of stage IV (metastatic) lung cancers in the Netherlands. Similarly, many malignant lymphomas and sarcomas are routinely analyzed for the presence of cancer-driving translocations, for diagnosis, prognosis and/or therapy choice.

In current routine clinical practice, solid tumour biopsies are stored as formalin-fixed paraffin-embedded (FFPE) material. Translocation detection in FFPE specimens is inherently difficult as the DNA is crosslinked and fragmented. Most often, microscopy-based fluorescent in situ hybridization (FISH) is applied to search for translocations. FISH has the limitation however that each translocation analysis requires a separate experiment and that results are not always conclusive.

RNA-based methods offer an alternative for translocation detection but are hampered by poor RNA quality, limited to the detection of gene fusions and only score known rearrangements. A more unbiased, robust and informative, all-in-one assay that for each tumour type simultaneously analyzes all candidate genes for any type of rearrangement, is therefore desired in the clinic.
11.50 Integration of Multi-Cellular and Multi-Layered Immune Cell Data to Stratify Rheumatological Diseases

- Stratification/reclassification of patients with clinically defined rheumatological diseases
- Integration of multi-cellular OMICS data generated from immune cell profiling
- Systems Immunology: from proof-of-concept to translational research

Dr Aridaman Pandit, Assistant Professor, Laboratory of Translational Immunology, University Medical Center Utrecht (UMCU)

12.10 From EMIF to EHDEN – scaling up the big data ecosystem across Europe

Nigel Hughes, Scientific Director, Janssen Clinical Innovation

12.30 Q&A Discussion

13.00 Networking Lunch

Here we present 4C-FFPE as a novel robust NGS-based technology for the detection of clinically relevant fusion genes and non-genic translocations in FFPE tumour samples

Prof Dr Wouter de Laat, Group Leader, Hubrecht Institute, Principal Investigator, Oncode & Professor of Biomedical Genomics, University Medical Center, Utrecht

12.10 Examining the Development of Microbiome-Related Biomarkers

- Examining the emerging research into associations between the human microbiome and disease
- Understanding how individual host-microbiome associations can be integrated with other "omics" data to develop precision medicine approaches

12.30 Q&A Discussion

13.00 Networking Lunch

WELCOME BACK

The afternoon session will continue in 2 tracks. Delegates are again invited to choose which of the tracks they would like to attend

TRACK THREE
Harnessing the Potential of E-Health & Digital Technologies to Advance Precision Medicine

New digital and machine-based technologies have the capability to revolutionise healthcare and drive precision medicine forward through more efficient patient-monitoring, real-time diagnoses, faster drug development, and more. This session will look at the application of new health-tech and digital developments; the benefits they are realising and the challenges to their further adoption.

14.00 Successfully Integrating E-Health Technology into Clinical Practice to Enable Real-Time, Personalised Diagnosis

- Exploring the latest innovations in mobile, smart, cloud and self-diagnostic technologies for obtaining patient data and insights
- Assessing the implications for healthcare systems of patient self-management technologies and increased patient empowerment
- Examining what tools are needed to effectively integrate e-health into clinical practice:
  - creating an effective decision support framework
  - identifying the key challenges to adoption and how to overcome them
  - educating patients and clinics as to the potential benefits

14.20 Harnessing the Potential of Artificial Intelligence (AI) for Developing Precision Medicine

- Exploring how AI and machine learning can facilitate the development of complex, digital biomarkers for the objective assessment of disease progression and to overcome traditional bottlenecks in new drug discovery

TRACK FOUR
Advancing Precision Medicine Through Multi-Omics Strategies

Genomics studies still contribute the vast majority of precision medicine-based data. However, it is now recognised that this is not enough, and so a new generation of -omics technologies is allowing assessment of the whole body-narrative. Taking a systems medicine approach and examining multiple -omics, using information from the genome, proteome, metabolome and transcriptome to identify critical drivers and pathways of disease, and the uniqueness of each human being, will be increasingly used to develop personalised medicine strategies.

14.00 Proteomics: Towards Personalized Proteome Profiling

Prof Dr Albert Heck, Professor of Biomolecular Mass Spectrometry and Proteomics, Utrecht University

14.20 Metabolomics: Developing Strategies for Metabolomics-Driven Systems Biology to Enable Personalised Medicine

Prof Dr Thomas Hankemeier, Principal Investigator, Analytical BioSciences & Metabolomics & Chair, Systems Biomedicine and Pharmacology Division, Netherlands Metabolomics Centre, Leiden University

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Examining Machine Learned Prediction of Treatment Benefit in Cancer

This presentation will discuss our work on gene expression classifiers. Firstly, addressing the challenge of ensuring classifiers are amenable to interpretation to obtain insight into biological processes that play a role in cancer initiation and progression. Secondly, exploring how one can obtain classifiers that predict treatment benefit to enable precision medicine.

Jeroen de Ridder, Principal Investigator & Associate Professor, Center for Molecular Medicine, UMC Utrecht

15.00 Q&A

15.15 Afternoon Refreshments & Networking

Exploring the Role of Epigenomics in Diseases

Since chemical modifications of DNA or histones are reversible processes, there is potentially a huge benefit in modulating such modifications for the treatment of human cancers using pharmacological drugs. To achieve such anti-cancer therapy, it is essential to decipher the molecular mechanisms underlying epigenetic and epigenomic perturbations in tumours. We will present our recent efforts, to better understand and map epigenetic alterations in cancers, including DNA methylation and hydroxymethylation.

We will also discuss about our very recent work on an emerging realm of biological regulation, termed RNA epigenetics. We will present our ongoing attempts to decipher the roles of RNA modifications in cancer.

Prof François Fuks, Director, Laboratory of Cancer Epigenetics & ULB-Cancer Research Center (U-CRC), ULB - University of Brussels

15.00 Q&A

15.15 Afternoon Refreshments & Networking

A Final Plenary Session will Conclude the Afternoon

Achieving the Effective Implementation of Precision Medicine into Clinical Practice

15.40 Translating Biological Research & Big Data into Actionable Insights for Use in Clinics

• Exploring how the journey from research to implementation could be accelerated
• Integrating technology with existing healthcare databases to give better patient knowledge and insight
• Getting big data into clinical decision support frameworks: how can the flow of health data be facilitated?
• Exploring how broad genomic profiling can be turned into valuable information that can be used quickly and easily for patients’ benefit in clinics

Prof Dr Harald Schmidt, Professor & Head of Department of Pharmacology & Personalised Medicine, Faculty of Health, Medicine & Life Science, Maastricht University

16.00 Managing the Implications of Precision Medicine Advancement for Healthcare Systems

• Examining the impact on the healthcare professional (HCP) and their role:
  - how do HCPs need to adapt to deliver the healthcare of the future?
  - effectively managing increasing patient empowerment
• Communicating and convincing HCPs of the validity and potential of new personalised treatments and therapies
• Assessing the infrastructure, data and technology changes required to current healthcare systems in order to deliver a precision medicine approach
• Developing and implementing precision medicine training programmes for healthcare professionals

Prof Dr Frank E. Rademakers, Chief Medical Technology Officer, University Hospitals Leuven
Dr Tessel Rigter, RIVM - National Institute for Public Health and the Environment, Center for Health Protection & Amsterdam UMC, Vrije Universiteit Amsterdam, Clinical Genetics, Section Community Genetics, Amsterdam Public Health Research Institute

16.40 Q&A Discussion

17.00 Closing Remarks from the Chair & Close of Conference

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