UK Pharmacogenetics & Stratified Medicine Network

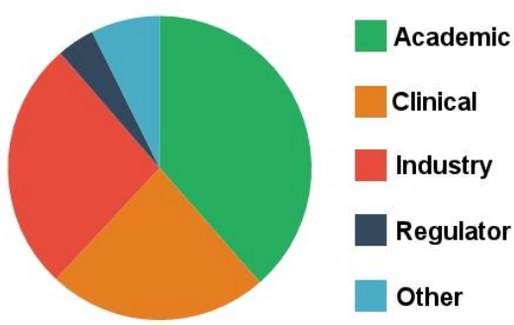
5th Annual Open Meeting

30 Euston Square, London **21 March 2018**

Welcome to the 5th UK Pharmacogenetics & Stratified Medicine Network Open Meeting

Thanks to our speakers for giving their valuable time to present the latest developments in this fast moving field, and to all our delegates for attending and contributing to the discussions. We would also like to thank our sponsor Bristol Myers Squibb, and the exhibitors, for their support. All proceeds from the meeting go to cover the cost of the meeting and to maintaining the Network.

Membership of the Network is steadily increasing year on year and we now have 670+ members from across all sectors; the pie chart indicates the proportion of the membership by sector. Membership is free, simply visit the website **www.uk-pgx-stratmed.co.uk** and apply online. Listing in our collaborators database is an excellent way of highlighting your expertise to colleagues and finding potential research partners.



Our website attracts global interest with visitors from 94 countries. Take some time to explore the website and you will the find latest news from the sector, a wealth of information on events and funding opportunities, as well as recordings of the excellent presentations delivered at our meetings and workshops. This year our workshops have discussed:

- encouraging clinicians to become the entrepreneurs of the future to develop new technologies to deliver personalised medicine in the clinic;
- support for primary care to adopt personalised medicine and carry out research;
- promoting the use of pharmacogenomics in the NHS to improve patient care.

2018 is an exciting year for the Network. This June, we are looking forward to meeting with the leaders of other similar international organisations to discuss developing an international pharmacogenomics consortium for promoting the use of personalised medicine worldwide. Today we hope you enjoy the presentations and have the opportunity to make contacts with colleagues from across all sectors.

Bristol-Myers Squibb & Immuno-Oncology: Advancing Oncology Research

At Bristol-Myers Squibb, patients are at the centre of everything we do. Our vision for the future of cancer care is focused on researching and developing transformational I-O medicines for hard-to-treat cancers that could potentially improve outcomes for these patients.

We are leading the scientific understanding of I-O through our extensive portfolio of investigational compounds and approved agents. Our differentiated clinical development programme is studying broad patient populations across more than 50 types of cancers with numerous clinical-stage molecules designed to target different immune system pathways.

Our deep expertise and innovative clinical trial designs position us to advance I-O/I-O, I-O/chemotherapy, I-O/targeted therapies and I-O/radiation therapies across multiple tumours and potentially deliver the next wave of therapies with a sense of urgency. We also continue to pioneer research that will help facilitate a deeper understanding of the role of immune biomarkers and how patients' individual tumour biology can be used as a guide for treatment decisions throughout their journey.

We understand making the promise of I-O a reality for the many patients who may benefit from these therapies requires not only innovation on our part but also close collaboration with leading experts in the field. Our partnerships with academia, government, advocacy and biotech companies support our collective goal of providing new treatment options to advance the standards of clinical practice.

Bristol-Myers Squibb

Programme Overview – Morning

08.00-09.00	Registration and refreshments	
09.00-10.50	**SESSION 1 : Development of stratified/personalised medicine** **Chair : Professor Sir Munir Pirmohamed**	
09.00-09.10	Welcome	Professor Sir Munir Pirmohamed
09.10-09.40	MRC strategy for stratified medicine in the UK	Professor Sir John Savill
09.40-10.10	NHS England Personalised Medicine Strategy	Professor Sue Hill
10.10-10.40	Innovate UK – Growing and scaling the UK's best precision medicine businesses	Dr Kath MacKay
10.40-10.50	NIHR-CRN Stratified Medicine Roadmap : Update & Implementation	Professor Michael Beresford
10.50-11.30	Morning Coffee	
11.30-13.10	**SESSION 2 : Inflammatory Diseases** **Chair : Professor Chris Chamberlain**	
11.30-12.00	Stratified medicine for asthma	Professor Ratko Djukanovic
12.00-12.30	Personalising treatment pathways for psoriasis	Professor Chris Griffiths
12.30-13.00	Stratified medicine for primary biliary cholangitis	Professor David Jones
13.00-13.10	The view from here – a different perspective	Janette Rawlinson
13.10-14.20	Lunch and exhibitors' stands	

Programme Overview – Afternoon

14.20-15.30	**SESSION 3 : Pharmacogenomics** **Chair : Professor Ann Daly**	
14.20-14.50	**Implementing WGS analyses into pre-emptive pharmacogenomics advice**	**Professor Magnus Ingelman-Sundberg**
14.50-15.20	**Pharmacogenomics of serious adverse drug reactions**	**Professor Sir Munir Pirmohamed**
15.20-15.30	**Patient story : Developing SJS**	**Stuart Doyle**
15.30-16.00	**Afternoon tea**	
16.00-17.10	**SESSION 4 : Industry Developments** **Chair : Professor Sir Munir Pirmohamed**	
16.00-16.30	**Improving response to immune checkpoint inhibitors**	**Dr Tom Lillie**
16.30-17.00	**Pharmacogenetics & Stratified Medicine: the benefits to pharma, physicians and patients**	**Dr Ruth March**
17.00-17.10	**Close of conference**	**Professor Sir Munir Pirmohamed**

#UKPGx2018

UK PHARMACOGENETICS & STRATIFIED MEDICINE NETWORK

MRC Strategy for stratified medicine in the UK

Professor Sir John Savill

The MRC's Stratified Medicine Initiative began in 2010 and continues to be a major part of the MRC research strategy, with a commitment of close to £60 million to fund a range of research consortia.

The overall aim of the Initiative is to improve our understanding of how to tailor treatments and interventions to the individual needs of people living with a wide range of diseases and conditions. The MRC is coordinating its activities in this area with members of the Stratified Medicine Innovate Platform Coordination Group, which includes Innovate UK, the National Institute of Health Research, the UK Health Departments, Cancer Research UK and Arthritis Research UK.

Stratification, underpinned by a sound understanding of disease, will also enable us to pinpoint new targets for treatments, biomarkers that tell us more about disease progression and response to treatment, and novel drugs to be tested in the most appropriate patient groups.

NHS England Personalised Medicine Strategy

Professor Sue Hill

The future direction of healthcare is clear. At one end, there is a focus on improvements to population health and, at the other, increasing personalization of treatment and interventions.
The potential of the genomics revolution to transform personalized medicine is a focus of healthcare systems across the world. Many countries have established, or are developing initiatives that emulate, the learning and progress of the UK 100 000 Genomes Project. What must not be overlooked is the transformative effect that genomics will have on clinical decision-making, practice and patient outcomes over the coming years.

This will be realized only through clinical leadership driving and delivering new pathways of care, and by coupling extensive genomic analysis with high-fidelity clinical phenotyping. At present, there is an opportunity to determine how genomics can best support cost-effective improvements to care pathways.

To take this forward the NHS England Board has approved the creation of a comprehensive NHS Genomic Medicine Service early in 2017. This will have genomic multidisciplinary teams at its core, supported by a genomic laboratory and informatics infrastructure, and a national genomic testing directory from 2018–2019.

Work is currently underway to identify where genomics can support improvements to drive a value-based approach to clinical practice, including within the important field of pharmacogenomics, and how the NHS can be aligned more closely with research, clinical trials and industry to deliver enhanced benefits.

Innovate UK – Growing and Scaling the UK's Best Precision Medicine Businesses

Dr Kath MacKay

Innovate UK is the UK's Innovation Agency and the prime channel by which the UK Government incentivises innovation in business. Innovate UK is growing the UK economy by developing and scaling the UK's best SMEs and providing opportunities for strategic collaboration – since its creation in 2007 it has invested over £3.75 billion with industry into 11,000 innovative projects which has led to the creation of over 70,000 new jobs and £16bn of added value to the UK economy.

As an established funder of life science businesses and academic organisations, Innovate UK has delivered focused initiatives to drive forward precision medicine and provide connections into academic and clinical infrastructure. This includes the creation of the Stratified Medicine Innovation Platform with a consortium of government bodies and leading charities in 2011, through to partnerships with the private investment community and charity funders in the present day.

This presentation will detail Innovate UK's success stories in precision medicine, evolution of its funding models, plans for the growth and scale of the UK's best precision medicine businesses and its role in delivering the Government's Industrial Strategy ahead of the formation of UK Research and Innovation in April 2018. **www.gov.uk/government/organisations/innovate-uk**

NIHR CRN Stratified Medicine Roadmap : Update & Implementation

Professor Michael Beresford

The NIHR Clinical Research Network (CRN) is funded by the Department of Health for England and provides the infrastructure to support delivery of high quality clinical research within the NHS. Scoping work undertaken by the network has identified that the number of stratified medicine studies within the CRN Portfolio is increasing and that these studies can be challenging to deliver.

The CRN has established the Stratified Medicine Roadmap Project in partnership with the UK Pharmacogenetics and Stratified Medicine Network in order to try to address some of these challenges and to ensure that the CRN is well placed to support the growing field of stratified medicine research (see: **http://www.uk-pgx-stratmed.co.uk/index.php/november-2016-workshop-videos**).

The project has focused on revising internal CRN processes and improving external communications to enhance the support that the network is able to give to studies with the aim of improving delivery of stratified medicine studies, as well as working with key partners to address areas that do not fit within the remit of the CRN. In this presentation, Professor Michael Beresford outlines the aims and objectives of the project and summarises the key outputs and next steps.

Stratified medicine for asthma

Professor Ratko Djukanovic

Personalising treatment pathways for psoriasis

Professor Chris Griffiths

The management of psoriasis should be patient-centred and holistic in nature. As we understand more about the pathogenesis of psoriasis, its comorbidities and natural history, the importance of a proactive approach to care becomes more relevant. The translational approach to research over the past twenty years has facilitated the development of effective, targeted biologic therapies, the most recent and notable being the interleukin-17 and interleukin-23 p19 inhibitors. However, not all patients respond or maintain their response to biologics in real world practice. Thus, careful interrogation of registries such as the British Association of Dermatologists Biologic Interventions Register and its bioresource leading to identification of clinical, genetic and immune biomarkers, which can aid stratification of disease and identification of drug response endotypes, will enable a more precise targeted approach of drug to patient.

This approach is the one being taken by the MRC stratified medicine consortium Psoriasis Stratification to Optimise Relevant Therapy (PSORT) which seeks to develop an algorithm or stratifier. With the advent of systems medicine and computational platforms, multi-omics data can be integrated with and aligned to an holistic approach to lifestyle modification such as weight loss and smoking cessation tailored to the individual. If successful, PSORT would lead, in addition, to a new molecular taxonomy of psoriasis, new targets for therapy and individualised flexible dosing of biologic therapies for the disease.

Stratified medicine for primary biliary cholangitis

Professor David Jones

Primary Biliary Cholangitis (PBC) is an autoimmune disease of the liver affecting 18-20,000 patients in the UK. It is an important cause of both morbidity and mortality. As well as being an important cause of cirrhosis and end-stage liver disease (it remains an important indication for liver transplantation) the symptoms of PBC can have a major impact on life quality. At the outset of the UK-PBC programme treatment was limited to a single agent, the hydrophilic bile acid Ursodeoxycholic Acid (UDCA), which has limited efficacy with regards to disease progression and no impact on symptoms.

The UK-PBC programme has recruited over 7000 patients (around 1/3 of the whole UK patient population) into a programme to understand the nature of response (and non-response to UDCA) and to provide a platform for the development and evaluation of novel targeted treatment approaches.

Using this unique resource, we have: 1) validated clinical criteria to identify high risk, UDCA non-responding patients, 2) demonstrated a clear age component to disease risk with younger patients having a more aggressive disease form, 3) defined the quality of life and health utility impact of PBC (again an age-related phenomenon), 4) developed clinical predictive models to use in practice to quantify risk, 5) developed and delivered landmark trials of stratified second-generation therapy for use in high risk patients which has now entered routine clinical use.

Challenges remain, however, and the final year of the UK-PBC project will allow us to identify molecular characteristics at disease baseline, which will predict risk and allow fully personalised therapy. The ultimate goal will be curative therapy.

The view from here – a different perspective

Janette Rawlinson

Stratified or personalised medicine is a quickly evolving area in cancer research where exciting science is creating more and more theories, trials and hypotheses. This is resulting in an overwhelming number of treatment combinations being trialled and greater understanding by scientists of the biology behind many cancers. What do these advances mean to those receiving or seeking such treatment in conditions that traditionally have had very poor outcomes and limited treatment options?

Cancer Research UK established its Stratified Medicine Programme in 2010 and enrolled its first patients late 2011 to research melanoma, breast, ovarian, lung colorectal and prostate cancer with tumours genetically tested using tissue samples left over from routine surgery. After several years it focused on lung cancer, specifically NSCLC – the largest killer cancer in the UK with limited treatment options and poor outcomes. SMP2, led by Cancer Research UK Clinical Trials Unit in Birmingham, is conducted through 18 Experimental Cancer Medicine Centres. Its aim is to determine which patients benefit most from treatments based on their tumour's genetic signature including measuring tumour shrinkage and drug safety, assessing changes in ctDNA in a patients' blood prior to, during and post treatment to identify any changes linked to drug resistance.

Our speaker, a lay member on its programme board draws on different experiences to provoke thought from those involved to ensure crucial perspectives for patients, carers and relatives are included within future design of research and treatment.

Implementing WGS analyses into pre-emptive pharmacogenomics advice

Professor Magnus Ingelman-Sundberg

Results from analyses of WGS and WES sequencing efforts reveal that about 40% of all LOF and missense mutations of importance for prediction of drug response are rare. Pharmacokinetic analyses in twins also reveal that 50% of the interindividual inherited variations in metoprolol and toresimide pharmacokinetics are caused by mutations not routinely analysed in the pharmacogenetic platforms currently used. This forms a problem for specific individualized drug therapy when the patient specific mutations have to be taken into consideration.

The talk will consider the genes and drugs of importance where NGS based sequencing data would substantially add information beyond the current platforms to facilitate individualized drug therapy. This includes the description of algorithms able to predict the functionality of missense mutations in the pharmacogenes and protocols for streamline analyses in personalized medicine where the whole genome sequence is taken into consideration.

Pharmacogenomics of serious adverse drug reactions

Professor Sir Munir Pirmohamed

Adverse drug reactions (ADRs) are a major clinical problem accounting for a great deal of morbidity, mortality and are a drain on healthcare resources. ADRs can generally be divided into on-target and off target reactions. Both types of ADRs have a genetic predisposition, but the quantitative contribution of genetic *vs*. non-genetic factors varies with the type of reaction, the drug implicated and the patient's clinical co-morbidities.

Genomic research in this area has over the last few years discovered a number of predisposing loci, for both target and off-target reactions, some of which are being incorporated into clinical practice. The role of HLA and predisposition to immune mediated adverse reactions has been particularly fertile in identifying new associations, often through genome wide technologies. Indeed, since 2001, at least 30 new HLA-ADR associations have been reported. Two of these are in clinical practice (*HLA-B*57:01* for abacavir hypersensitivity, and *HLA-B*15:02* for carbamazepine-induced Stevens-Johnson syndrome).

It is also important to note that some of the predisposing loci identified through genome-wide approaches are providing insights into novel mechanisms of the adverse reactions, which would not have been possible with candidate gene studies. Future work in this area will be dependent not only on multi-centre international collaborations, but also on the use of electronic health records to identify cases and controls.

Patient Story : Developing SJS

Stuart Doyle

From weeks in a Ketamine induced coma, and losing 90% of my skin, to learning to walk, talk, and eat again. Pain, loss, and despair. Career – over. Personal life in tatters, and my future seemingly changed forever. I was miserable, clinically depressed, in pain, and newly blind. But, life is a funny old thing. I'm now happy to say, I'm happy! As strange as it sounds, I am now happier than I have ever been in my life. I'm in severe chronic pain, am legally blind, and my life is restricted.

A touch of irony: Pre-TENS, I took one medication. TENS hits, cause? Idiopathic. Post-TENS – I now have 24 items on my repeat prescription, like I said – irony!

This talk will be a brief look at the horrors I escaped, the mountains I've climbed – and fallen down. More than anything, hopefully it'll give you an insight into just how far you can come if you have the different kinds of crazy and loving family that I've had. As well as that, hopefully it will help you all realise that without the hard work and incredible research that comes from all of you, people like me wouldn't stand a chance. Because, make no mistake, what you bring to the table is hope.

If I can leave you with one thing, it's that what you all do truly makes a difference.

Thanks to you, I'm now unstoppable.

Improving response to immune checkpoint inhibitors

Dr Tom Lillie

Anti-PD-1 therapies have had a profound impact on the treatment of many cancers, with evidence of positive impact of monotherapy treatment on over 20 types of cancer, including demonstration of improved Overall Survival in multiple cancer types. This has resulted in numerous regulatory approvals, many of which have been granted breakthrough designations or accelerated approvals. Concerted efforts have been made to define predictive bio-markers to identify patients who are most likely benefit, with significant progress being made around markers of inflammation and tumour mutational burden. Using these approaches helps to ensure that the right treatment reaches the right patient at the right time. This personalised approach to healthcare may lead not only to better outcomes but also more efficient use of health resources.

The field of immuno-oncology is now rapidly moving into combination therapies – with an astounding range of trials encompassing combinations with classical cancer treatments, targeted therapies and multiple immune therapies (including vaccines). New scientific insights are starting to help navigate this combinatorial complexity, as we begin to understand the underlying biology. The potential use of multiple predictive bio-markers to define optimal treatment pathways poses challenges for patients, healthcare professionals, regulators, payors and industry. It is clear that the ongoing challenge of cancer treatment cannot be tackled by a single stakeholder, nor resolved by simple solutions.

Continued discussion to understanding the priorities and needs of each partner in the treatment and access equations will be critical, in order to support and drive the rapidly advancing science and deliver access to innovative medicines across Europe.

Pharmacogenetics & Stratified Medicine: the benefits to pharma, physicians and patients

Dr Ruth March

Delivering precision medicines linked to diagnostic tests is integral to AstraZeneca's ambition to deliver targeted, life changing treatments to patients most likely to benefit. We will discuss AstraZeneca's experience of developing precision medicines and linked diagnostic tests, and its benefits for pharma, physicians and patients.

We will also present progress from AstraZeneca / MedImmune's Genomics Initiative, leveraging information from two million genomes by 2026, including 500,000 genomes from clinical trials. Proof of concept studies are helping us uncover genetic drivers of disease, aid patient stratification, and discover new, innovative treatments. We are integrating precision medicine across our entire drug development platform, transforming drug discovery and development, and ensuring that patients will benefit from a revolution in patient care.

Professor John Savill

Professor Sir John Savill (BA, MBChB, PhD, FRCP, FRCPE, FASN, FMedSci, FRS, FRSE), a clinician scientist from Edinburgh, took up the position as chief executive and deputy chair on 1 October 2010. The appointment was initially for three years; after which it was extended until April 2016, and subsequently to 30 September 2018. Last year, Sir John was appointed Regius Professor of Medical Science at the University of Edinburgh with effect from 1 April 2018, and announced that he would be leaving the MRC on 31 March 2018. Sir John was a member of the Council from 2002 to 2008 and chaired two Research Boards during this period. Between 2008 and 2010 John worked part-time as the chief scientist for the Scottish Government Health Directorates.

He was knighted in the 2008 New Year Honours List for services to clinical science.

John started his research career with a degree in Physiological Sciences from Oxford University in 1978, followed by degrees in Medicine at the University of Sheffield in 1981. He received a PhD from the University of London in 1989.

Professor Sue Hill

Professor Sue Hill OBE (PhD DSc CBiol FRSB Hon FRCP Hon FRCPath) is the Chief Scientific Officer for England and the head of profession for the healthcare science workforce in the NHS and associated bodies – embracing more than 50 separate scientific specialisms.

Sue is the Senior Responsible Officer for Genomics, having led the establishment and ongoing direction of the NHS Genomic Medicine Centres and the NHS contribution to the 100,000 Genomes Project. She is now driving forward the programme developing a Genomic Medicine Service across the whole NHS to deliver personalised treatments and interventions, building collaborative partnerships with research and industry.

Sue also has a broad portfolio of policy responsibilities across NHS England and the wider NHS, providing professional leadership and expert clinical advice across the whole health and care system. This involves working across government, with the Department of Health, with the NHS, Public Health and Health Education England and other external stakeholders to inform policy, influence legislation, deliver strategic change and to introduce new and innovative ways of working.

Dr Kath MacKay

Kath Mackay is Interim Deputy Director of Health & Care at Innovate UK, the UK's innovation agency and prime channel by which the UK Government incentivizes innovation in business. Kath leads a team delivering programmes across high value areas for UK health and biomedical businesses. These include advanced therapies, precision medicine, medicines discovery, digital health, disease prevention & wellbeing, antimicrobial resistance and vaccines, biosciences, the Biomedical Catalyst and Small Business Research Initiative. Kath joined Innovate UK in 2013 to co-manage the Regenerative Medicine & Advanced Therapies Programme.

Kath has over 15 years' experience in business development, commercial operations, and life sciences research, spanning multiple disease areas and technologies across USA and EU markets.

Twitter @kath_mackay

LinkedIn **www.linkedin.com/in/kathmackayphd**

Professor Michael Beresford

Professor Beresford is Specialty Cluster Lead for National Institute of Health Research (NIHR) Clinical Research Network (CRN) responsible for the National Specialties of Children, Reproductive & Childbirth, Musculoskeletal, Ophthalmology and Haematology. He is responsible across the NIHR CRN for Therapeutics, Stratified / Personalized Medicine and Clinical Pharmacology. He has led and Chaired the "Stratified Medicine Roadmap Project," led by the NIHR CRN in partnership with the UK Pharmacogenetics and Stratified Medicine Network.

Professor Beresford is Brough Chair, Professor of Child Health at University of Liverpool. He is Director of the UK's only 'Experimental Arthritis Treatment Centre for Children' and Director of the 'NIHR Alder Hey Clinical Research Facility for Experimental Medicine'. He is co-investigator and/or work stream lead on several MRC-funded Stratified Medicine programmes.

He was Chair of the UK Paediatric Rheumatology Clinical Study Group from its inception for almost ten years, responsible for developing and overseeing a UK wide comprehensive portfolio of clinical trials and related studies covering the entire spectrum of diseases in paediatric rheumatology in partnership with the adult rheumatology and musculoskeletal community. He is Executive member of the Paediatric Rheumatology European Society (PRES), Chairs the PRES SLE Working Party and UK JSLE Study Group and has developed an internationally renowned Childhood Lupus translational research programme as part of the UK's only Centre of Excellence for Childhood Lupus.

Professor Ratko Djukanovic

Ratko Djukanovic (**www.uhs.nhs.uk/prof_djukanovic**) is Professor of Medicine at Southampton University and Consultant Respiratory Physician at the Southampton University Hospital NHS Trust. He is a NIHR Senior Investigator and a Fellow of the European Respiratory Society. As the Theme Lead for Respiratory and Critical Care in the NIHR Southampton Biomedical Research Centre, he heads a translational research programme across the life-course, including severe asthma, Chronic Obstructive Pulmonary Disease (COPD), rare lung diseases (CF, ILD, PCD), intensive care, lung cancer, respiratory infections and biomarkers for stratified medicine.

Professor Djukanovic has been a pioneer in stratifying asthma and has focused on projects in asthma that aim to develop and take advantage of a stratified medicine approach in this common condition. His special interest is the mechanisms of severe asthma and development of drugs and biomarkers for this condition. He is recognised for his collaborative approach to research involving academia and pharma. Professor Djukanovic co-founded UBIOPRED, the IMI-funded €22M programme in severe asthma, which is applying the latest state of the art 'omics technologies to stratify asthma into phenotypes. He has been three times Chair of the Steering Group of the Translational Research Partnership, a consortium of UK centres of respiratory research excellence working with industry to help drug development. He is the founder and Chair of the European Severe Asthma Clinical Collaboration (SHARP).

Professor Chris Griffiths

Chris Griffiths qualified in Medicine from St Thomas' Hospital Medical School, London. He trained in Dermatology at St Mary's Hospital, London, and at the University of Michigan, USA, where he was on Faculty for 4 years. He was appointed to the Foundation Chair in Dermatology at the University of Manchester in 1994 and is an honorary consultant dermatologist at Salford Royal NHS Foundation Trust. He founded the Manchester Dermatopharmacology Unit and Manchester Psoriasis Service in 1994. At the University of Manchester he has held several senior posts including Faculty Research Dean and Director of the Manchester Academic Health Science Centre. He currently leads for precision medicine in the UK Government's Manchester Devolution initiative.

Chris received a lifetime achievement award from the American Skin Association in 2009. In 2015 he received the Sir Archibald Gray Medal for outstanding service to British Dermatology and the Society of Cosmetic Scientists Medal. He is a National Institute for Health Research (NIHR) Senior Investigator, Fellow of the Academy of Medical Sciences and elected Member of Academia Europaea. Chris was appointed an Officer of the Order of the British Empire (OBE), for services to dermatology, in the Queen's 2018 New Year's Honours.

Professor David Jones

Professor Jones is Professor of Liver Immunology at Newcastle University and PI for the UK-PBC Research Consortium. He leads the internationally renowned autoimmune liver disease clinical service in Newcastle, hosted by the Newcastle upon Tyne Hospitals Foundation Trust (NUTH). He has worked in the area of the autoimmune liver disease Primary Biliary Cholangitis (PBC) for over 25 years, starting as an MRC Clinical Research and Clinician Scientist Fellow. Working initially on the underpinning biology of the disease, he has translated key mechanistic discoveries into new approaches to therapy.

The UK-PBC MRC Stratified Medicine programme, which he leads, has revolutionised thinking in the disease, defining the unmet need, developing the clinical tools needed to quantify risk and identifying the patient groups who need enhanced therapy in PBC. He has led the evaluation, approval and implementation programmes for the first stratified therapy in PBC (and indeed any rare liver disease), Obeticholic Acid, which is now available across the NHS. He is the Coordinator for the RARE-LIVER European Reference Network (ERN), which was established to support the development of clinical delivery programmes for rare liver disease (PBC is a rare disease) across Europe.

In addition to his clinical and research work, he has a long interest in training and is the NIHR Dean for Faculty Trainees. He has played a key role in the development of new integrated academic pathways, which will play a key role in developing the next generation of researchers in the area of Stratified Medicine and its underpinning technologies.

Janette Rawlinson

Janette has been involved within cancer and health research since October 2013. A passionate advocate, she aims to raise understanding of patients' needs to improve services and outcomes by raising their perspectives for consideration within research, policy and service developments. Appointed to the British Thoracic Oncology Group Steering Committee and NHSE's Clinical Expert Group (Lung cancer) 2017, CRUK's Stratified Medicine Programme board 2015 and NCRI Clinical Studies Group (lung) 2013. Also NIHR Health Services Delivery Research board 2014, European Lung Foundation's Patient Advisory Group (Lung Cancer) 2015, Public Health England's National Cancer Registration & Analysis Service Clinical Reference Group (lung) 2015. Prior to the above roles, she raised funds for cancer charities and contributed to patient literature. An experienced NHS Non-Executive Director since 2006, currently Lay Member on Sandwell & West Birmingham Clinical Commissioning Group – winners of HSJ CCG of the Year 2015, 2013 and finalists 2016, Commissioning Today 'Commissioners of Year 2014' and finalist NHS Midlands Leadership awards 2015. Vice Chair of Primary Care Co-Commissioning Committee committees, she serves on audit, finance and performance, governing body, cancer steering group and co-chairs Personalised Healthcare Budget committee.

An independent business consultant by profession, she works across sectors with a varied client portfolio. She chairs the Midlands Women as Leaders group for the Institute of Directors. She combines her professional experience in international business, economic, people and business development with her board work bringing operational and strategic perspectives at local, national and international level.

Professor Magnus Ingelman-Sundberg

Magnus Ingelman-Sundberg (PhD BSc.Med) is Professor of Molecular Toxicology since 1996 and research group leader in Pharmacogenetics at the Department of Physiology and Pharmacology , Karolinska Institutet since 2006. He has more than 420 original papers, 24 500 citations (39 000 in Google Scholar) and an H-index of 85 (ISI) or 106 (Google Scholar). He is a highly cited researcher 2015, 2016, 2017, a member of The Nobel Assembly at Karolinska Institutet since 2008 and a member of Editorial Advisory Boards of e.g. Trends in Pharmacological Sciences (Edit Board), Pharmacogenetics and Genomics, Pharmacogenomics, Drug Metabolism Reviews, Human Genome, Drug Metabolism and Disposition and also a member of Academia Europaea.

His research focuses on genetics, epigenetics, polymorphism, regulation, function and toxicology of the hepatic ADME system with aims at understanding interindividual differences in drug response. Furthermore he develops novel hepatic in vitro systems for studying liver function and validation of drug targets. Further info from an Interview with Magnus Ingelman-Sundberg See: Trends Pharmacol Sci. 2015; 36:65-7.

Professor Sir Munir Pirmohamed

Professor Sir Munir Pirmohamed (MB ChB, PhD, FRCPE, FRCP, FBPhS, FMedSci) is currently David Weatherall Chair in Medicine at the University of Liverpool, and a Consultant Physician at the Royal Liverpool University Hospital. He is also the Associate Executive Pro Vice Chancellor for Clinical Research for the Faculty of Health and Life Sciences. He also holds the only NHS Chair of Pharmacogenetics in the UK, and is Director of the MRC Centre for Drug Safety Sciences, Director of the Wolfson Centre for Personalised Medicine and Executive Director, Liverpool Health Partners.

He was awarded a Knights Bachelor in the Queen’s Birthday Honours list in 2015. He is also an inaugural NIHR Senior Investigator, and Fellow of the Academy of Medical Sciences in the UK. He is also a Commissioner on Human Medicines. His research focuses on personalised medicine in order to optimise drug efficacy and minimise toxicity, move discoveries from the lab to the clinic and from clinic to application. He has authored over 420 peer-reviewed publications, and has a H-index of 85.

Stuart Doyle

In June of 2006 I was a head chef, a new father, recently engaged, and loved life. Overnight I lost it all, including my son, who, one year on in 2007, was taken to live in Australia. I'd lost my boy, my sight, my independence. My life was controlled by pain, and I'd lost everything, even hope. TENS is a lot for a young couple to go through, it broke us.

From 2007, it became my mission to get back a life, and I have! I began writing the world's first patient account of what it's like going through TENS and being burned alive. I published '*High Dependency*' on Kindle in May 2013. Shortly after this I met my partner – who's crazier than I am.

I've been a volunteer advocate with both Action For Blind People and RNIB. I've been involved with SJS Awareness UK since it began, and spoke at The House of Commons to help them launch their first national campaign. I'm now a volunteer mentor for teenagers who have to live with chronic conditions, chronic pain, and/or disabilities. I do this through Hampshire schools.

As well as this, I'm the Patron for the North West Coast Research Community, which is part of the Clinical Research Network. Our aim is to connect the phenomenal research that's being done, to those that need to hear about it the most – the patients. It's early days, but I've no doubt it'll be a huge success, the team there is amazing!

Dr Tom Lillie

Tom Lillie is the Vice President and Head of European Clinical Development for Merck, Sharp and Dohme. Dr Lillie completed his undergraduate training at Brasenose College, University of Oxford, where he was awarded a first class degree in pharmacology, cell biology and immunology, before earning his doctorate from the Department of Physiology at the University College of London. He then completed his medical education at the University College London Medical School, receiving honours distinction in clinical pharmacology and surgery. He is a member of the Royal College of Surgeons of England and the Faculty of Pharmaceutical Medicine of the Royal College of Physicians.

Tom has led global, regional and affiliate medical teams, encompassing both clinical development and medical affairs functions. He has extensive experience in clinical research in phase 2 – phase 4, and in supporting regulatory, safety and reimbursement interactions. During his clinical and industry career he has specialised in oncology & haematology, but has also worked in ID / vaccines, cardiovascular, diabetes, and neurologic therapy areas.

Dr Ruth March

Ruth March, PhD, is Senior Vice President of AstraZeneca's Precision Medicine and Genomics (PMG) function, leading over 100 diagnostic scientists and experts globally. A member of the senior team in Innovative Medicines and Early Development, Ruth is accountable for delivering diagnostics to drug projects, and also leads AstraZeneca's Genomics Initiative, analysing genome sequence from up to 2M patients.

She led the build of Personalised Healthcare (PHC) within AstraZeneca, ensuring 80% of clinical drug projects are following a PHC approach. She has achieved 15 diagnostic launches in partnership with diagnostic companies: linked to Iressa (EGFRm tissue and plasma), Lynparza (BRCAm blood and tissue), Tagrisso (EGFRm T790M tissue and plasma) and Zurampic (serum uric acid).

Ruth has pioneered innovation, delivering the world's first drug label based on circulating tumour DNA (Iressa); first companion diagnostic partnership in next generation sequencing (Illumina); first FDA approval of lab-based companion diagnostic (Lynparza); first diagnostic approval based on both ctDNA and tissue testing (Tagrisso); first point of care diagnostic in gout (Zurampic) and first partnership for asthma point of care diagnostics (AgPlus).

She is a member of Definiens' Supervisory Board and a genomics specialist with 50 scientific publications and patents.

Thank you to our exhibitors

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The Northern Ireland Centre for Stratified Medicine (NICSM), Ulster University

The NICSM aims to identify how our genes or patterns in levels and state of molecules within our bodies, or subtle differences in medical images, could be used to create robust clinical decision making tests for a range of degenerative diseases.

The Centre is based in the Clinical Translational Research and Innovation Centre (C-TRIC) on the Altnagelvin Hospital site in Derry/Londonderry.

We have the largest single critical mass of researchers solely focused on stratified medicine in Ireland; with a core team of molecular biologists, clinicians and Bioinformaticians / data scientists. We have 23 Core staff, 19 PhD students, and 36 NHS Clinicians affiliated to our Research centre including General Practitioners (GPs) and NHS Health Trusts (predominantly from the Western Health & Social care Trust at Altnagelvin Hospital).

The Centre was established in Autumn 2013 following an award of £11.5M (from the European Union Regional Development Fund (ERDF) EU Sustainable Competitiveness Programme for Northern Ireland, Invest NI, the Northern Ireland Public Health Agency (HSC R&D) ILEX & Ulster University) to Professor Tony Bjourson (Director).

Research areas at the centre include mental health, eye disease, cancer (specifically multiple myeloma and prostate cancer), inflammatory disease, diabetes, cardiovascular disease and musculoskeletal health.

Ulster University

NIHR Clinical Research Network

The NIHR Clinical Research Network (CRN) is funded by the Department of Health for England and is the research arm of the NHS. The CRN makes it possible for patients and health professionals across England to participate in clinical research studies within the NHS. The CRN provides the infrastructure that allows high-quality clinical research funded by charities, research funders and life-sciences industry to be undertaken throughout the NHS and social care setting. The CRN works with patients and the public to make sure their needs are placed at the heart of all research, and provides opportunities for patients to gain earlier access to new and better treatments through research participation.

The CRN supports recruitment of approximately 600,000 participants to around 5,000 clinical research studies each year, meets the costs of NHS staff that support research, and provides specialist training so that patients can be confident that research is being delivered by trained, experienced front-line NHS staff. The CRN also meets the costs of using NHS facilities, such as scanners and x-rays that are needed in the course of a study, and provides practical help in identifying and recruiting patients, so that researchers can be confident of completing the study on time and as planned.

The CRN is undertaking a project in partnership with the University of Liverpool and the UK Pharmacogenetics and Stratified Medicine Network (UKPSMN) to explore ways to improve the delivery of stratified medicine studies on the CRN Portfolio. This Stratified Medicine Roadmap Project aims to ensure that the CRN and broader clinical research community can evolve in response to the increasing number of stratified medicine studies on the UK CRN Portfolio, and is developing a number of initiatives in order to do so. These include the development of practical guidance and training for CRN staff to improve the support that they provide for stratified medicine studies, involvement of patients in the development of communication tools to improve conversations with potential participants in stratified medicine research, and the identification of stratified medicine champions within the clinical research community. Details of the project and some of these initiatives will be presented by Professor Michael Beresford during today's programme.

Further details of the CRN can be found at **www.nihr.ac.uk**

NIHR Nottingham Biomedical Research Centre

Pushing the frontiers of medical science

The NIHR Nottingham Biomedical Research Centre (BRC) provides the platform for a transformational partnership between internationally renowned researchers based at the University of Nottingham and three NHS Trusts. We are based at Nottingham University Hospitals NHS Trust.

Together we drive innovation and competitive translational research to change the future of health for people with some of the most common diseases and conditions in the UK. Our research areas are:

- gastrointestinal and liver diseases
- hearing
- respiratory diseases
- musculoskeletal diseases
- mental health and technology

At the core of the NIHR Nottingham BRC is our world-leading expertise in Magnetic Resonance Imaging (MRI).

Our research themes are founded on excellent discovery science with associated clinical academic strengths and an established track record of early translation into internationally competitive.

Through the NIHR Nottingham Clinical Research Facilities we offer a network of clinical research facilities with expert staff in developing and delivering experimental medicine for early phase research. Together we are at the heart of Nottingham, a leading city for research and innovation.

Follow us on Twitter @NottmBRC or visit us at **www.nottinghambrc.nihr.ac.uk**

Nottingham
Biomedical Research Centre

NHS
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Save the date!

Our 6th Annual Open Meeting will take place in London on March 20th 2019

#UKPGx2019