Regions for Health Innovation

#EURegionsWeek
Personalised Medicine

Boosting health research at regional levels

Pierre Meulien - Executive Director - Innovative Medicines Initiative

Workshop on Personalised Medicine - Brussels October 9th 2018
What is driving the profound changes in the world of healthcare

- Science and technology (including digital technology)
- The epidemiology of disease (global trends - outbreaks etc)
- The role (and behaviour) of the consumer of healthcare - the patient
- Unsustainable financial burden of chronic disease on our health systems

All actors involved in the system from public or private spheres have to adapt to the impacts of these four drivers
What determines health of an individual

- **Their Genome (+)**
  - Epigenome
  - Microbiome

- **Their Environment**
  - Demographic
  - Nutrition
  - Air and water quality
  - Exposure to infectious diseases
  - Lifestyle
“Big” Health Data

Genomic data

Population registries, Clinical trials databases

Care pathways, decision support, trends and alerts

Environmental data

Mobile devices

Bio-sensors

Clinical applications

Social networks
Visit our new website
www.imi.europa.eu

Sign up our newsletter
bit.ly/IMInewsletter

Follow us on Twitter
@IMI_JU

Join our LinkedIn group
bit.ly/LinkedInIMI

Email us
infodesk@imi.europa.eu

IMI 10th Anniversary Scientific Symposium
October 22-23, Brussels

IMI Stakeholder Forum
October 24, Brussels

Thank you!
Investment Priorities  (a personal view)

- Prevention
- Bring more innovative health economics into mainstream thinking
- Integrate social sciences and humanities into health R&I
- Application of digital solutions when they make sense
- Create more productive interfaces between health systems and innovation providers – in an integrated manner
- Educate the public so that they can adjust lifestyles and behaviours
Workshop on Personalised Medicine

boosting research at regional level

Irene Norstedt

Acting Director
European Commission
DG Research and Innovation
Directorate Health
Personalised medicine refers to a medical model using characterisation of individuals’ phenotypes and genotypes (e.g. molecular profiling, medical imaging, lifestyle data) for tailoring the right therapeutic strategy for the right person at the right time, and/or to determine the predisposition to disease and/or to deliver timely and targeted prevention.

Definition developed by the Advisory group for the H2020 Health, demographic change and well-being challenge
Activities on personalised medicine

- 2010: Preparatory workshops (-omics, biomarkers, clinical trials/regulatory, uptake)
- 2011: European Perspectives conference
- 2013: Commission Staff Working Document on "use of '-omics' technologies in the development of PM"
- 2015: Council conclusions on Personalised Medicine
- 2016: Personalised Medicine Conference
- 2016: Establishment of ICPPerMed & secretariat
- 2011-2020: Funding research and innovation (FP7 and Horizon 2020, IMI and IMI2) to develop PM approaches in a wide variety of areas from "molecular understanding of disease" to "implementation in health care"
Funding research in Personalised Medicine

- **FP7**: 209 projects = €1334 million
- **H2020**: 160 projects = €870 million
- **IMI JU**: 40 projects ≈ EU €430 million + EFPIA in-kind contribution € 420 million
International Consortium for Personalised Medicine

**WHAT**
- Collaboration of research funders and policy makers from EU Member States and beyond
- Establish Europe as a global leader in PM research
- Support the PM science base through a coordinated approach to research
- Provide evidence to demonstrate the benefit of PM to citizens and healthcare systems
- Pave the way for PM approaches for citizens

**WHY**

**HOW**
- Implementation of a Roadmap based on PerMed Strategic Research Agenda (SRIA)
State of the play

• ICPPerMed Conference 2018 'Personalised Medicine in Action', Berlin, 20-21 Nov 2018
• Action Plan 2017: set of activities forming the work programme over the next two years
• ERA PerMed: a European Research Area Network to align funding of national (and regional) support to trans-national research projects; first call February 2018
• The ICPPerMed secretariat is funded by a CSA grant from the EC. It runs all operations and acts as an umbrella for other relevant CSA grants addressing: health economy; internationalization, clinical trials and cooperation between regions.
Members active in the IC PerMed

- 28 countries and 4 regions
- 11 Health Ministries
- 6 Science and Education Ministries

- Austria
- Brazil
- Canada + British Columbia Region
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- EU as observer
- Finland
- France
- Germany
- Hungary
- Ireland
- Israel
- Italy + Lombardy Region
- Lithuania
- Luxembourg
- Moldova
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovenia
- Spain + Regions Basque Country & Navarre
- Sweden
- Switzerland
- Turkey
**Actions to support inter-regional cooperation in the area of Health R&I**

- Participation of regions in the IC Permed initiative
- Mapping of the Health R&I priorities in the RIS3
- Thematic Partnerships, under the DG JRC Smart Specialisation Platform for Industrial Modernisation
- EU Regions Workshop for PM organised by DG RTD in May 2017
- Coordination and Support projects under grant agreement preparation, for regions with interest in the area of personalised medicine.
Mapping regional Health R&I priorities

- Available data
  - RIS3, publicly available documents (in various languages, at various NUTS levels)
  - 136 RIS3 available on the web have been analysed
  - Health R&I priorities extracted from the RIS3
  - Regional authorities contacted for comments.

"Regional Innovation Strategy - Provence-Alpes-Côte d'Azur Region - 2014". One of the 5 areas for strategic activities is: (3) "Health and Food" (page 28): (3.1) Improving the management of the patient with early detection, assistance to medical diagnostic and the development of medical devices: (3.1.1) Predictive biomarkers for improving disease prevention; (3.1.2) In vivo imaging; (3.1.3) Immunotherapy; (3.1.4) Areas of neuroscience, oncology, infections; (3.1.5) Development of the Eurobiomed cluster on personalised medicine, chronic diseases and rare diseases. (3.2) Developing e-health solutions: (3.2.1) processing and interpretation of medical images; (3.2.2) telemedicine. (3.3) Preventing disease through the promotion of the Mediterranean diet.
Health R&I in the RIS3

124 RIS3 out of the 136 analysed include Health R&I as one of their priorities.

- No Health R&I priority in the RIS3
- Health R&I priority in the RIS3
Personalised Medicine in the RIS3 priorities

52 RIS3 out of the 136 analysed, explicitly prioritise **Personalised Medicine (38%)**

- No Personalised Medicine priority in the RIS3
- Personalised/stratified/precision Medicine priority in the RIS3
A dedicated partnership to facilitate the alignment of regional agendas and cross-regional cooperation in personalised medicine

- The **Smart Specialisation Platform for Industrial Modernisation** (S3P-Industry) aims to support EU regions committed to generate a pipeline of industrial investment projects following a bottom-up approach implemented through interregional cooperation, cluster participation and industry involvement.

- **16 Thematic Partnerships** already established under this platform, fully open to regions and aimed at bringing those willing to co-invest.

- Two thematic partnerships are focused on Health:
  - **Medical technologies** (created in 2017)
  - **Personalised Medicine** (created in 2018) – To align complementary assets, infrastructures and work to integrate value chains across different technology sectors for PM. It will bring the agenda to implement PM to the next level.
Support of Regional contribution to the International Consortium for Personalised Medicine

*Two Coordination and Support Action projects to establish and support networking between regions and to foster interregional cooperation in different European countries*

SAPHIRE (3 years; 4 beneficiaries; M€ 1,78)
Title: **Securing Adoption of Personalised Health in Regions**

Aims:
- To establish an inclusive network, including a broad range of stakeholders and integrating remote or sparsely populated regions
- To map activities, identify regional needs in line with smart specialisation strategies
- To support interregional collaborations and identify opportunities for funding

*Grant Agreements under preparation (Oct. 2019)*
Support of Regional contribution to the International Consortium for Personalised Medicine

REGIONS4PERMED (4 years; 6 beneficiaries; M€ 1,68)
Title: Interregional Coordination for a Fast and Deep Uptake of Personalised Health

Aims:
- To promote personalised prevention in healthcare
- To support cooperation and coordination to tackle fragmentation
- To create a participatory approach; build trust; enable a multi-stakeholder process; channel investments towards Personalised Health
- To help coordinating regional policies and innovation programmes
- To support synergies between H2020 and ESIF.
Articles and videos on our activities

• Perspective for the Journal Personalised Medicine: 'Enabling personalised medicine in Europe by the European Commission’s funding activities'

• Clinical and Translational Sciences: 'Personalised Medicine in Europe'

• Video 'How co-operation paves the way for personalised medicine', issued by the American Society for Human Genetics (ASHG) for the ASHG conference in Orlando, October 2017:
  https://youtu.be/vSpSwLZ54nY

Thank you
Umbria Region experience

Regions for Health Innovation Partnership - Workshop on Personalised Medicine: boosting health research at regional level

Brussels, 09/10/2018
Promoting health research and ICT innovative solutions in the field of personalized medicine
Policy instruments and references

Umbria RIS3

✓ Focus on the role of ICT as key enabling technology (KET)
✓ Support to the offer of innovative services and ICT spread in relevant sectors for citizens and companies quality of life

ERDF Operational Programme 2014-2020:
Axis I Research & Innovation and Axis II Digital Growth

Specific mission of Umbria Digital Agenda and Umbria Telematic Plan -
“…developing innovative digital services & promoting ICT to improve citizens quality of life and health...”
Stakeholders engagement process

Creation of a specific task force for the implementation of digital agenda and the promotion research and innovation activities in the field of ICT, involving:

- Umbria region representatives
- Research and innovation actors
- Regional healthcare system stakeholders
1. CARE – a platform for the monitoring and treatment of heart failure and vascular disorders
   Project starting date: end of 2018
   Project duration: 2 years

2. UMBRIABIOBANK – a start up for a biobank in Umbria Region
   Project starting date: end of 2018
   Project duration: 2 years

**Beneficiaries:** Perugia Hospital, University of Perugia

**Total budget:** around 1,100,000 euro
CARE – an innovative platform for the monitoring and treatment of heart failure and vascular disorders (1)

Project objectives & main activities

Development of **patient-specific, interoperable, predictive digital platform** integrating biological and medical patient data, thanks to…

- specific data model and automated computerised algorithms
- automatic advanced diagnostic imaging techniques

…in order to analyse huge amounts of patient data, support health professionals to diagnose, monitor and treat chronic patient suffering of cardiovascular diseases, predicting also the risk of developing further disorders

Clinical trials for **testing the platform prototype** with the involvement of different regional hospitals and patient groups
Expected results and main advantages:

Increased diagnostic and treatment efficacy, allowing medicine to be tailored to each individual patient, obtaining a reduction of adverse side effects (e.g. reducing the risk complication associated to the use of contrast medium)

Increased efficiency in healthcare and in the quality of patient life, avoiding unnecessary hospitalization thanks to the personalized monitoring

Reduction of the overall cost of healthcare
UMBRIABIOBANK – a start up for a biobank in Umbria Region (1)

Project objectives & main activities:

Creation of a **regional infrastructure for the collection, storage, management** and **molecular characterisation** of biological samples such as blood, tissue or cells, through:

- conversion of existing archives of tissues & creation of new digitalized sample repository and association with related clinical, molecular and patient /donor data
- definition of protocols and standardised collection of new biological samples and storage of patient/donor related data
- use of big data and data analytics solutions to enable massive data processing and exchange
Expected results and advantages

Creation of a regional biobank infrastructure in accordance with international standards including the **accreditation to national and European network of biobanks**

*Improved research quality* thanks to remote collaboration, development of in silico experimentation, access to distant resources (models, systems, data, and patient material held in national databases and international biobanks)

Improved *diagnostic capacity and predictive medicine*

Increased quality & *reduction the overall cost* of healthcare
Thank you for the attention

Contacts:
programmazione@regione.umbria.it
lcaporizzi@regione.umbria.it
Personalised Medicine
Medical University of Bialystok experience

Miroslaw Kwasniewski
Centre for Bioinformatics and Data Analysis
Medical University of Bialystok
Department of Genetics,
University of Silesia in Katowice
MEdICAL UNErIVERSITY OF BIAlYSTOC

CENTRE FOR CIINICAL RESEARCH
CENTRE FOR BIOINFORMATICS
AND DATA ANALYSIS
Precision medicine limitations:

- narrow pool of effective prognostic and diagnostic markers
- limited number of effective drugs
- simplified solutions for patient’s data interpretation

- decisions inadequate or not as personalized as expected

**MOBIT Project** (MOlecular Biomarkers for Individualized Therapy)

- Creation of a unique biobank providing the service of samples:
  - central and peripheral tumor tissue
  - normal tissue
  - blood (whole blood, serum, plasma)
  - urine (supernatant, sediment)
- Development of personalized diagnostic procedures based on tumor heterogeneity and integrated genomics, transcriptomics, proteomics, metabolomics and PET/MRI imaging analysis
- The creation of software platform for collection, management, integration and analysis of -omics and clinical data,
- The development of software platform-assisted personalized diagnostic procedures based on integrated genomics, transcriptomics, proteomics, metabolomics and PET/MRI imaging data
- The establishment of reference model for personalized tumor diagnosis and intervention
**MOBIT Project** (MOlecular Biomarkers for Individualized Therapy)

**The Consortium**

- Medical University of Bialystok – Leader
- Indivumed GmbH, Hamburg, Germany – Foreign Partner
- Academic Centre for Pathological and Genetic-Molecular Diagnostics, Bialystok – Partner
- Medical University of Poznan – Partner
- Department and Clinic of Thoracic Surgery, Greater Poland Pulmonology and Thoracic Surgery Center, Poznan – Partner
- District Specialist Hospital, Olsztyn – Partner
- Institute of Animal Reproduction and Food Research, Polish Academy of Science, Olsztyn – Partner
- Bialystok University of Technology – Partner
- ideas4biology, Poznan – Partner
The MOBIT approach

- Biobanking and Clinical Data Collection
- Omics and PET/MRI Data Collection
- Data Annotation, Aggregation and Integration
- Clinical interpretation
- Clinical implementation

MOBIT Project
- Early Stage NSCLC

MOBIT Plus Project
- Advanced NSCLC
- Other Solid Tumors
Centre for Bioinformatics and Data Analysis MUB

- Software development: SmartBioBase
- Curated knowledge databases
- Data analysis (research)

Centre for Clinical Research MUB

- Ideas 4 Biology Poznań
- Laboratory of Molecular Imaging
- Centre for Clinical Research MUB

Technical University of Bialystok

- HPC Cluster University of Silesia in Katowice
- HPC data analysis Data storage

- Bioinformatics pipelines development
- WGS, RNA-Seq, RRBS, smallRNA-Seq
- Metabolomics
- Proteomics
- PET/MRI images
Research Biomarker Discovery

BigData Storage and Analysis

Commercialisation

Clinicians

Data Analysis
Data Interpretation
Decision Support

Databases

Research
Biomarker Discovery
BigData Storage and Analysis

Commercialisation

Genomics-related software development
AI-based BigData analysis
Support
Professor Tony Bjournson
(Director Northern Ireland Centre for Stratified Medicine)
Who we are:
C-TRIC: Clinical Translational Research & Innovation Centre
- A unique Partnership
- Contract Research Organisation & Healthcare Innovation Hub
  - bench to bedside research
- Offer Lab space and office accommodation

Who we work with:
- Genomics Medicine Ireland (GMI)
- Centre Personalised Medicine Ulster
- NI Clinical Research Services
- Nova Biomedical
- Cirdan
- Airbrio
- Raumedic
- Randox
- Clinishare
- Optum
A Driver for Precision Medicine...

- **We currently coordinate £23M in Stratified / Personalised Medicine/Genome Grants**

- **Northern Ireland Centre for Stratified Medicine**
  (£11.5M Oct 2013) - 20 academic research staff, 8 Research associates, 25 PhD Researchers and 45 affiliated GP/NHS clinicians.

- **Centre for Personalised Medicine, Clinical Decision Making & Patient Safety**
  (€8.6M/£7.5M awarded by EU SEUPB Jan 2017) – 14 partner organisations, academic, clinical, business, 10 PhD students and 15 affiliated clinicians.

- **First Undergraduate BSc Degree in Stratified Medicine (2013)**

- **Ulster Graduate Entry Medical School (GEMS) – FIRST INTAKE 2019**

- **Major Collaboration with Genomics Medicine Ireland (GMI)**
  (GMI located in C-TRIC and recruiting in N. Ireland IBD, MS Patients and soon other key diseases for WGS)

- **Part of Northern Ireland Genomics Medicine Centre – linked to UK 100,000 Genome Project**
Why we do what we do......

Context & Need: Aging Population.

Everyone wants to go to heaven - Nobody wants to die

- Elderly – largest users of prescription drugs
- 30% of population could be concurrently on 5-10 medicines.
- Prescribing cascade in the elderly (polypharmacy)
- Number people over 75 could increase by 40% by 2020.
- Number people over 85 could increase by 58% by 2020
- Multimorbid disease increases with aging population
Response to a drug depends partly on the patient’s characteristics and behaviors:

1. **Incorrect diagnosis** – patient does not have the condition diagnosed – better sub-classification of disease.
2. **Inappropriate drug prescribing**
3. **Lack of Patient compliance** – Don’t take the medication or lack of adherence to a dosing regimen;
4. **Errors** - misreading a prescription or administering a drug incorrectly
5. **Interference** from foods or supplements;
6. **Drug-Drug Interactions** - Interference from concurrently prescribed medications
7. **Coexistence of other disorders** (comorbidities or multi-morbidities),
8. **Metabolism Differences** in drug pharmokinetics/pharmacodynamics due to age, sex, race, genetic polymorphisms, hepatic or renal insufficiency.

**Key Objectives & Challenges**

- Clinical trials – exclusion criteria may reflect non-response rates
- Many trials exclude those with multi-morbidity
- Elderly - highest consumers of prescription medications- but often excluded
- Inclusion criteria – does not reflect majority of real life patients.
- Need to better sub-classify complex diseases in context of multi-morbidity.
- Need personalised therapies for patients with multimorbidity.
- Better diagnosis - better treatment selection,
- Clinical end-user education & patient compliance
Biomarker Panels

*genetic, phenotypic, imaging, and environmental to better:

**To:**

- **Predict Disease Susceptibility**
  (susceptibility/risk biomarker),

- **Diagnose Disease**
  (diagnostic biomarker-subclassify disease),

- **Assess Stage & Evolution of Disease**
  (prognostic biomarker)

- **Response to treatment**
  (predictive biomarker) & drug development.
Ulster-C-TRIC Genome Project (with GMI)
N. Ireland Centre for Stratified Medicine
(£11.5M Awarded 2013)

- Systems Medicine (WGS/Clinical/Environ)
- Cardiovascular Disease
- Diabetes
- Mental Health & Alzheimer’s Disease
- Rheumatoid Arthritis (Autoimmune disease)
- Motor Neuron Disease-ALS
- Oncology
- Commercial Roadmap
- Education Training

Funding: £11.5M Oct 2013 (InvestNI, HSC, Ulster University)
Centre for Personalised Medicine

Clinical Decision Making & Patient Safety
(€9M/£8M Awarded April 2017)

Driving Stratified Medicine Framework
into hospitals, clinics & homes....... 

Applied to:
1. Cardiovascular Disease
2. Emergency Abdominal Surgery
3. Acute Kidney Injury
4. Diabetes
5. Dementia
• Commercial Partners

Funding: €9M/£8M April 2017 (EU SEUPB)
Ulster Precision Medicine Genome Program Overview

Diseases with shared environmental and/or genetic determinants
Inflammatory-Related

Multimorbidity Patient Cohorts (N=7000):
Rheumatoid Arthritis, Diabetes, Depression, Cardiovascular Disease/Stroke,
Alzheimer’s Disease, Cancer, Motor Neuron Disease (including multi-morbidity)

Outputs:
Diagnostics / Predictive Bio-Markers – Clinical Decision Tools / Repurposing of Drugs

Platforms:
PoC & Centralised – (Integration of Biomedicine, Data Analytics & Engineering)
“Here’s my DNA sequence, Oh and my clinical and lifestyle data too”
Training the next generation of skilled staff in stratified medicine

Offer undergraduate & post-graduate courses in Stratified Medicine.

Graduate Entry Medical School (2019) - focus on primary care
(Now Recruiting Dean & Professor of Medical School)

Unmet Need: Provision of the Skilled Trained Workforce

Precision Medicine Skills Challenge
BSc Hons Degree & Postgraduate Courses

Stratified Medicine
BSc Degree & Postgraduate courses

Web: http://study.ulster.ac.uk/prospectus/course/201415/2911
Facebook: https://www.facebook.com/personalisedhealth
Twitter: https://twitter.com/StratMedicineNI
Centre Academic Staff

Bioinformatics
Dr Bill Duddy, Assoc Prof./Lecturer BioInformatics
Dr Priyank Shukla, Assoc Prof./Lecturer BioInformatics
Dr Steven Watterson, Assoc Prof./Lecturer Systems Biology/Modelling, Cardiovascular Disease
Dr Shu Dong Zhang, Assoc Prof./Lecturer Computational Biology
Dr Vanessa Devine, Assoc Prof./Lecturer Bioinformatics

Cardiovascular Disease
Dr Victoria McGilligan, Assoc Prof./Lecturer Cardiovascular Disease/Inf1ammation
Prof Aaron Peace, Consultant Cardiologist
Dr Sarah Atkinson, - Assoc Prof./Lecturer Cardiovascular/diabetes/vision

Neuro-Muscular Disease
Dr Dugeuze, Stephanie Assoc Prof./Lecturer Motor Neurone Disease
Dr Bill Duddy, Assoc Prof./Lecturer BioInformatics

Inf1ammatory Disease
Dr David Gibson, Assoc Prof./Lecturer Inf1ammatory Disease
Dr Cathy McGeough, Assoc Prof./Lecturer Inf1ammatory Disease

Diabetes
Dr Catriona Kelly, Assoc Prof./Lecturer Diabetes
Dr Paula McClean, Assoc Prof./Lecturer Dementia, Diabetes
Professor Maurice O’Kane

Mental Health
Dr Elaine Murray, Assoc Prof./Lecturer Mental Health
Professor Siobhan O’Neill & Psychology Team

Oncology
Prof Denis Alexander, - Oncology, Multiple Myeloma,
Dr Caroline Conway, - Assoc Prof./Lecturer Oncology, Head & Neck Cancer
Dr Andrew McDowell, Assoc Prof./Lecturer Oncology, Prostate cancer
Dr Stephen Drain, Assoc Prof./Lecturer Molecular Immunology

Ms Plumber, Brenda, Centre Administration; Ms Tonina Sechi, Centre Technician
10 Additional Research Staff funded from aligned grants

PhD Students

Bioinformatics
Benjamin Wingfield
Andrew Parton

Cardiovascular Disease
Melody Chemaly

Muscular Disease
Laura Le Gall

Inf1ammatory Disease
Amanda Eakin
Tahanver Ahmed

Diabetes
Fiona Manderson Koivula
RyanKelsey
Declan McGuigan
Andrew English
Paul Denver
Paul Millar

Mental Health
Coral Lapsley
Rebecca Kennedy
Sophia Ahmed

Oncology
Philip Egan
Eliza Yankova
1. **Cardiovascular Disease**
   Dr Aaron Peace WHSCT (Lead)
   Dr Godfrey Aleong LUH-Rep of Ireland,
   Prof Stephen Leslie NHSH- Scotland
   Dr Victoria McGilligan, Ulster University
   Mr Raymond Bond Ulster University
   2 PhD Students – under recruitment

2. **Emergency Surgery**
   Dr Michael Sugrue (Lead) LUH-Rep of Ireland
   Dr Paula Loughlin WHSCT
   2.5 x Research Nurses (PhD Students)
   Clinical Director-TBC LUH-Rep of Ireland
   2 PhD Students – under recruitment

3. **Acute Kidney Injury**
   Dr Ying Kuan WHSCT (Lead)
   Dr AnneMarie Moran LUH-Rep of Ireland
   RA-Melody Chemaly-Ulster University
   2 PhD Students – under recruitment

4. **Diabetes**
   Prof Vivien Coates-Ulster University (Lead)
   Prof Sandra MacRury– UHI Scotland
   Prof Hugo Van Woerden NHS H Scotland
   Dr Ahmed Khamis LUH -Rep of Ireland
   Research Associate (TBC)
   2 PhD Students – under recruitment

5. **Alzheimer's Disease**
   Dr Kongfatt Wong-Lin Ulster University (Lead)
   Dr Ken Mulpeter LUH
   Dr Stephen Todd WHSCT
   Dr Paula McClean Ulster
   Prof. David Finn NUIIG
   2 PhD Students – under recruitment

---

**Support & Impact:**

**Point of Care Testing**
Professor Maurice O’Kane (Clinical Dir) –WHSC
Biomedical Scientist (TBC) – WHSC

**Biomarkers-generic framework**
Professor Tony Bjourson (PI) -Ulster University
RA-Coral Lapsley -Ulster University

**Data Analytics**
Professor Liam Maguire-Ulster University (Lead)
John Andy Bonnar-LYIT-Rep of Ireland
RA Data Analytics
RA- Process Engineer-Ulster University

**Project Management**
Dr Donna Tedstone -Ulster University
Peter Devine (Business Development)
Christine Stewart Admin Coordinator -Ulster University
EBR

**Companies**
Randox Laboratories,
United Healthcare-Optum,
Clinishare,
NICRS,
Arch Net,
Acknowledgements: Northern Ireland Centre for Stratified Medicine – Clinical Partners

Prof, Aaron Peace  Clinical Consultant (Cardiology) Western Health & Social Care Trust
Dr, John Purvis,  Clinical Consultant (Cardiology) Western Health & Social Care Trust
Prof, Maurice O’Kane  Consultant Chemical pathologist (Western Health & Social Care Trust)
Dr, Neil Black  Consultant Physician in Endocrinology & Diabetes (Western Health & Social Care Trust)
Dr Athinyaa Thiraviara  Consultant Physician in Endocrinology & Diabetes (Western Health & Social Care Trust)
Dr, David Armstrong  Consultant Rheumatologist (Western Health & Social Care Trust)
Dr, Dr Gary Wright  Consultant (Rheumatology) Musgrave Park Hospital Belfast
Dr, Philip Gardner  Consultant (Rheumatology) Western Health & Social Care Trust
Dr, Stephen Todd  Clinical Geriatrics Consultant (Western Health & Social Care Trust)
Dr, Leo Tumelty  Clinical Psychiatry Consultant (Western Health & Social Care Trust)
Dr, John Brady  Consultant Psychiatrist (Western Health & Social Care Trust) assisted by and.
Dr, Catherine McDonnell  Trainee Psychiatrists (Western Health & Social Care Trust)
Dr, Stephen Moore  Trainee Psychiatrists (Western Health & Social Care Trust)
Dr., Bronagh Sproule  Trainee Psychiatrists (Western Health & Social Care Trust)
Dr, Catherine Forgie  Trainee Psychiatrists (Western Health & Social Care Trust)
Dr, Michael Warren  Trainee Psychiatrists (Western Health & Social Care Trust)
Dr, Aisling Sheridan  Trainee Psychiatrists (Western Health & Social Care Trust)
Dr, Noel Crockett  Trainee Psychiatrists (Western Health & Social Care Trust)
Dr , Gilliam McMullan  Consultant Clinical Psychologist (Western Health & Social Care Trust)
Dr, Declan O’ Rourke  Consultant Histopathologist (Belfast Health and Social Care Trust)
Dr, Hugh O’ Kane  Consultant Urological Surgeon (Belfast Health and Social Care Trust)
Dr, Michael McKenna  Consultant Pathologist; Clinical Lead for Pathology Services (Western Health & Social Care Trust)
Dr, Mary McMenamin  Biomedical Scientist (Western Health & Social Care Trust)
Dr, Patrick Elder  Consultant Haematologist, (Western Health & Social Care Trust)
Dr, Feargal McNicholl  Consultant Haematologist, (Western Health & Social Care Trust)
Dr Margaret Bowers  Consultant Haematologist (South Eastern Health & Social Care Trust).
Dr, Moulod ElAgnaf  Consultant Haematologist (South Eastern Health & Social Care Trust)
Dr, Jeremy Hamilton  Consultant Haematologist (South Eastern Health & Social Care Trust)
Dr, Yong Lee Ong  Consultant Haematologist (South Eastern Health & Social Care Trust)
Mr, Ian Dieghan  Chief Biomedical Scientist (Western Health & Social Care Trust)
Dr, Shiela O’Connor  Principal Clinical Scientist (Haematological Malignancy Diagnostic Service -HMDS), Leeds
Lady Prof, Maeve Rae  Consultant Gerontologist, Belfast City Hospital/QUB) Visiting Professor at Ulster
Useful Links

Northern Ireland Centre for Stratified Medicine
http://biomed.science.ulster.ac.uk/stratifiedmed

C-TRIC (Clinical Translation Research & Innovation Centre)
www.c-tric.com

Stratified Medicine BSc Degree & Postgraduate courses
http://study.ulster.ac.uk/prospectus/course/201415/2911

Facebook:
https://www.facebook.com/personnalisilnedhealth

Twitter:
https://twitter.com/StratMedicineNI

Professor Tony Bjourson (aj.bjourson@ulster.ac.uk)
Director: Northern Ireland Centre for Stratified Medicine,
Biomedical Sciences Research Institute, University of Ulster