6th Annual Translational Medicine Conference

‘Personalising Health and Care’

Date: 25th and 26th September 2014 | Venue: City Hotel, Derry/Londonderry, N.Ireland, UK
Conference Sponsors

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### 'Personalising Health and Care' - Conference Programme

#### Day One Thursday 25th Sept

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<tr>
<td>1:00 pm</td>
<td>Registration and Tea/Coffee</td>
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| 2:00 pm| Welcome and Opening Address  
Brenda Stevenson, Mayor of Derry                                                                                                                  |
| 2:05 pm| Barry Henderson, Business Development Manager, C-TRIC  
‘Supporting R&D in Personalised Health and Care’                                                                                               |
| 2:15 pm| Dr Penny Wilson Innovation Platform Lead for Stratified Medicine, TSB, UK  
‘Supporting Translational Medicine and Healthcare Innovation in the UK’                                                                             |
| 2.35 pm| Supporting Life and Health Sciences in NI & ROI  
Dr Clive Wolsley, Health & Social Care (R&D Division), Public Health Agency  
Sam Kinghan, Invest Northern Ireland  
Patricia McCrory, EU Thematic Lead (Health), Queen's University of Belfast                                                                      |
| 2.55 pm| Break for Tea/Coffee - Poster Viewing Session                                                                                                       |
| 3.25 pm| Dr Jonathan Berg, Consultant Clinical Biochemist, Sandwells and West Birmingham Hospitals, NHS Trust, UK  
‘TPMT shows the way for routine pharmacogenomics; let’s understand why it has been accepted into routine clinical practice’                   |
| 3.55 pm| Dr David McEnaney, Director of the Cardiovascular Research Unit, Craigavon Area Hospital  
‘Cardiology Futures’                                                                                                                               |
| 4.30 pm| Oral Presentations Parallel Sessions  
Chaired by  
Prof Tony Bjorson, Director, Biomedical Sciences Research Institute & Director, Northern Ireland Stratified Medicine Centre, University of Ulster  
Chaired by  
Dr David Brownlee, HSC Innovations                                                                                                                  |
| 5.00 pm| Stratified/Precision Medicine 1  
Technology & novel approaches….1                                                                                                                     |
| 5.15 pm| Stratified/Precision Medicine 2  
Technology & novel approaches….2                                                                                                                     |
| 5.30 pm| Stratified/Precision Medicine 3  
Technology & novel approaches….3                                                                                                                     |
| 5.45 pm| Stratified/Precision Medicine 4  
Technology & novel approaches….4                                                                                                                     |
| 6.00 pm| Stratified/Precision Medicine 5  
Technology & novel approaches….5                                                                                                                     |
| 6.15 pm| Close                                                                                                                                                |
| 6.45 pm| Drinks Reception/ Poster Viewing Session                                                                                                             |
| 7.45 pm| Conference Dinner  
Guest Speaker  
Joanne Stuart, NI Science Park Foundation Ltd (Director)                                                                                         |
Day 2 Friday 26th Sept

8:30 am  Registration

9.05 am  Dr Mark Beggs, Associate Director / Chief Operating Officer of Stratified Medicine Scotland Innovation Centre
'Stratified Medicine Scotland – a National Enterprise for Precision Medicine'

9.35 am  Professor Charles Abraham, Professor of Psychology Applied to Health, University of Exeter
'The Role of Behaviour Change Intervention Design and Evaluation in Translational Medicine'

10.05 am  Coffee Break/ Poster Viewing Session

10.20 am  Ravi Rao, VP, Medicines Development Leader and Head Unit Physician, Immuno-inflammation Therapy Area Unit, GSK
'Developing new medicines: learning to take them personally'

10.50 am  Peter Weber, Professor of Nutrition, DSM Nutritional Products Ltd, Switzerland
'Personalising Micronutrient Intakes to benefit Human Health: Emerging Science & Consumer Needs'

11.20 am  Dr Hanne Albert, St Bartholomew’s Hospital, UK
‘Curing Back Pain Using Antibiotics’
title TBC

Lunch 12.00 - 1.00 Buffet Lunch/Poster Viewing

1.00 – 2.30 – Breakout Sessions

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<tr>
<th>Chair by</th>
<th>Dr Maurice O’Kane, Director R&amp;D Western Health and Social Care Trust Personalised/Stratified Medicine</th>
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<tr>
<td>1.00 pm</td>
<td>Chris Roche Chief Commercial Officer, Aridhia, UK ‘Why Personalised Medicine is a Long Tailed Business Model’</td>
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<th>Chair by</th>
<th>Prof Jonathan Wallace, University of Ulster Tech &amp; novel approaches for improved disease prevention, management &amp; patient care</th>
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<td>1.00 pm</td>
<td>Peter Devine, Head of Business Development, Intelligent Systems Research Centre, University of Ulster ‘Using novel technologies, devices and intelligent systems towards improved healthcare’</td>
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<th>Chair by</th>
<th>Dr Des Brennan, Life Sciences Interface Group, Tyndall Institute ‘Emerging technology platforms for near patient genetic analysis for personalised medicine’</th>
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<td>1.20 pm</td>
<td>Kieran Daly, Chair of BioBusiness ‘The use of technology towards personalised healthcare’</td>
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1.40 pm  Prof Steven Pennington, Professor of Proteomics, University College Dublin, Ireland ‘Development of a blood based protein signature to stratify patients for prostate cancer treatment. From Discovery to Clinical Diagnostics’

1.30 pm  Barney Devine & David Bolton, Word on the Ground ‘Using technology to better manage Post Traumatic Stress Disorder (PTSD)’

2.00 pm  Dr Nicholas Orr, Team Leader, Institute of Cancer Research, UK ‘The role of genetics and genomics in personalised approaches to breast cancer prevention and treatment’

2.00 pm  John Dinsmore, Health Innovation Lead, Centre for Practice and Healthcare Innovation, Trinity College Dublin ‘The BREATHE Project: A study of the development and use of assisted living technology by informal care givers and people living with chronic health conditions’

2.00 pm  Peter Donnelly, Chief Executive, BioBusiness Ltd. ‘Healthcare Technology & Apps: Regulatory Issues’

2.25 pm  Close

2.30 pm  Poster Viewing Session

Better Data, Better Health, Better Care Session

3.00 pm  Mr David Bingham, Chief Executive, Business Services Organisation, NI ‘Honest Broker Service - its Role in Better Care’

3.15 pm  Stephen Lusty, JAG’L Consulting ‘Building Northern Ireland’s Healthcare Analytics Capability’

3.30 pm  Professor Siobhan O’Neill, Psychology Research Institute, University of Ulster ‘Using Data to Improve Outcomes in Mental Illness and Suicide Prevention’

3.45 pm  Panel discussion chaired by Trung Do - Executive Director of Business Development at Partners Healthcare

4.00 pm  Results of Poster Competition and Closing Remark

4.10 pm  Close
BIOGRAPHIES

Professor Charles Abraham
Professor Charles Abraham is a social and health psychologist. His research focuses on improving the design and evaluation of interventions to change health behaviour patterns. The aim of his research is to optimise translation of research findings into improved healthcare practice. He employs a range of quantitative and qualitative methods and collaborates widely. He is Head of the Psychology Applied to Health (PAtH) group in the University of Exeter Medical School. The PAtH group consists of 5 core faculty, 8 research fellows and 10 doctoral students. He also hold honorary positions at Sussex, Maastricht, Nottingham and Curtin universities. He has investigated a wide range of behaviour patterns including exercise, diet, alcohol use, condom use, smoking cessation, blood and organ donation and management of chronic illnesses. He has developed and evaluated effective interventions to promote health-enhancing behaviours in a range of contexts from schools in South Africa to “Weight Watchers” classes in Poland. Charles Abraham is a practising, health psychologist (registered by the UK Health and Care Professionals Council) and between 1997 and 1999, he was the founding chair of the British Psychological Society Division of Health Psychology. In this role he led a team of psychologists who established the accreditation systems used to regulate health psychology practitioners in the UK. In 2003-2004 he was employed as a consultant in the UK Department of Health and in 2014, he was one of seven psychologists included in a list of the leading 100 practising scientists in the UK; a list generated for the first time by the UK Science Council. In the UK the National Institute for Health and Care Excellence (NICE) sets standards for quality healthcare and produces guidance on medicines, treatments and procedures. Charles Abraham has served on two NICE guidance development groups on health behaviour change in 2003/4 and 2012/13. In 2011/12 he served as scientific advisor to House of Lords Select Committee on Science and Technology, Inquiry into Behaviour Change which made 32 recommendations to government including advocating greater investment in evaluation of interventions.

Dr Mark Beggs
Dr Mark Beggs is Chief Operating Officer for Stratified Medicine Scotland based in Glasgow UK. SMS-IC is an Industry, Academia, NHS collaboration developing a commercial capability in Stratified Medicine. SMS-IC is based in Scotland, UK and capitalises on a strong academic research base in major disease areas coupled with unique NHS e-Health Records and industrial quality NextGen Sequencing and hosted analytics capabilities provided through our commercial partners Life Technologies and Aridhia Informatics. Mark holds a PhD in Clinical Biochemistry and a BA in Biochemistry both from Oxford University.

Mark has 25 years Industry experience. He ran Pfizer/Wyeth’s major collaboration in biomarker discovery (TMRC) over 2007-2013. This was an $80M Industry/academia/NHS/Government collaboration operating at a national scale. Prior to this he was Head of Consulting at TAP Biosystems in Cambridgeshire UK where he led a consulting team in delivering major change programmes for clients within Pharmaceutical Discovery and Biological production with particular focus on the application of manufacturing consultancy techniques in a Pharmaceutical Discovery environment. Mark has a further ten year’s direct experience in Pharmaceutical Discovery, in early stage Discovery roles, having worked variously for GSK in North Carolina USA, Astra Zeneca in...
Alderley Park, UK and J&J in Beerse, Belgium where he was Director of High Throughput Screening.

**Dr Jonathan Berg**
Jonathan Berg is a clinical scientist in a large Pathology Department in the West Midlands. His career has included all aspects of the routine Clinical Biochemistry environment. He has also developed a number of new processes and applied previously rather complex and research orientated tests into the routine environment. Over the last few years Jonathan’s department has taken an entrepreneurial approach within an NHS setting. This has included establishing a service for the pharmacogenomic test TPMT, which is used to check patients phenotype and genotype is compatible prior to starting on thiopurine drugs.

**David Bingham**
David joined the NHS as a National Administrative Trainee in 1976. He worked in Personnel before leaving the HPSS for a 2-year stint in the motor manufacturing industry. This was followed by a return to the HR function in the Health and Social Services. He worked as Director of Human Resources in the Eastern Health and Social Services Board, Belfast for 4 years. In 1993 he left to set up the Beeches Management Centre, a training, management development and consultancy organisation for Trusts and Commissioners in the HSS in Northern Ireland. He was appointed as Director of Human Resources for Health and Social Services in Northern Ireland in 2000, based in the Department of Health and Social Services and moved to his current job as Chief Executive of the Business Services Organisation (BSO) for HSC in April 2009. The BSO is a new organisation set up as part of the RPA reforms in the public sector in Northern Ireland. It is responsible for providing a range of business services to health and social care organisations. Its services include legal, financial, human resources, procurement and logistics, equality, family practitioner payments and internal audit. David has worked extensively on short term aid assignments in Health systems in Africa and Central Europe.

**Dr. Des Brennan**
Dr Des Brennan joined the NMRC (now Tyndall) in 1996 developing optical sensors for the food and dairy industries, specifically in the development of Near Infra-Red micro-spectrometer systems for online process control. He has worked on hardware development, algorithm implementation and instrument installation/test at end user facilities. In 2001 he joined the Microfluidics team, working on microfluidic devices to integrate liquid chromatography microsystems with optical waveguide sensors for use in the pharmaceutical industry. In recent years he has been working in the area of Point Of Care diagnostics systems for genetic analysis focusing on implementing biochemical protocols in microfluidic platforms specifically in the areas of DNA extraction, amplification and detection.

**Kieran Daly**
Kieran is the COO & Co-Founder of Health Beacon who develop smart tools for managing medication. Prior to Health Beacon, Kieran built and led the team at Shimmer successfully commercialising wearable health sensor technology licensed from Intel and served clients in over 60 countries. Kieran
is also the Chairman at BioBusiness, an industry association that promotes the Life Science and Health Technology Sector across the island of Ireland. He acts as a Research Advisor to Health XL who promote collaboration between established global brands and fast growth companies to drive innovation in healthcare and is a member of the Science Gallery's Leonardo group.

**Dr John Dinsmore**

John Dinsmore is the Health Innovation Lead and Deputy Director of the CPHI, his role involves building and leading teams to research and develop (R&D) new technologies, services and practices in a wide range of healthcare areas (these have included dementia, stroke, COPD, obesity, diabetes, mental health, autism, intellectual disability). Key to this R&D approach is the ability to link research with entrepreneurs, industry and enterprise bodies. Focus is on developing research for healthcare market spin out opportunities, which include the licensing of new intellectual property, innovating on existing technologies and services, spin out of campus companies and development of industry based healthcare research. With a background in health psychology research Dr. Dinsmore's work primarily focuses on behavioural change R&D ecosystems of healthcare technology and business market development to improve the adoption, sustainability and scalability of new healthcare technologies and services. Presently Dr. Dinsmore is involved with multiple national, European and international research projects developing new innovation models of healthcare technology, services and practice. Present projects include: DOCTRID ASSISTID (FP7), BREATHE (EU AAL CALL 5) and the Hegarty Fellow Programme with (Michigan State University (MSU)). Current and previous organisations Dr. Dinsmore has worked with on healthcare R&D projects include Intel Labs Europe, Designability, Tundstall Emergency Response, TSB Technologies, the Technology Research for Independent Living (TRIL) Centre, The Queen's University of Belfast, The Royal College of Surgeons Ireland, Imperial College London, University of Ulster Jordanstown and the National University of Ireland Galway.

**Dr Maurice O’Kane**

Dr O’Kane graduated at the University of Edinburgh and completed post-graduate education in Scotland, Northern Ireland and France. Dr O’Kane holds the position of Consultant Chemical Pathologist at Altnagelvin Hospital since 1996. Dr O’Kane has research interests in Diabetes and Laboratory Quality & Safety. Dr O’Kane also holds the position of visiting Professor to the University of Ulster and Chief Executive at the Clinical Translational Research and Innovation Centre (C-TRIC).

**Dr Nick Orr**

Dr Nick Orr studied molecular biology and genetics at the Queen’s University of Belfast and statistics at University College London. He joined the US National Cancer Institute as a postdoctoral fellow in 2005 to work on the genetic epidemiology of prostate and breast cancer. He joined ICR as a staff scientist in 2008 and was appointed to the position of Career Development Faculty in 2012. His lab investigates how inherited genetic variation can contribute to breast cancer risk in women and men. His research group has recently started exploring whether genetic information can help to predict an individual patient’s response to treatment.
Dr Stephen Pennington
Steve is currently Professor of Proteomics in the School of Medicine and Medical Science and the UCD Conway Institute of Biomolecular and Biomedical Research at University College Dublin. He is a lead investigator in the Dublin based ‘Prostate Cancer Research Consortium’ and a member of the first Global Action Plan initiative launched by Movember. His team (www.biomedicalproteomics.org) work closely with clinical colleagues to apply label-free LC-MS strategies to discover protein biomarkers to meet specific unmet needs in specific disease areas. To progress these biomarkers to potential clinical diagnostic assays he has established a dedicated mass spectrometry laboratory for targeted multiplexed protein biomarker measurement and clinical evaluation.

Dr Ravi Rao
Ravi Rao received his medical degree from Cambridge University, trained in rheumatology in the North Thames Deanery in London and gained his PhD from Imperial College London. He then worked as a post-doctoral fellow in the Department of Pathology at Harvard Medical School. In 2004, he returned to Imperial College at the Hammersmith Hospital as a Senior Lecturer and Consultant Rheumatologist where he continues to practise part time in the field of inflammatory arthritis. He has published a number of peer-reviewed papers, primarily in the field of leucocyte trafficking and vascular biology as well as clinical rheumatology.
In 2007, he joined Roche as a Clinical Scientist and led global registrational development programmes for various monoclonal antibodies in immunology, including Rituximab, Ocrelizumab (both anti-CD20) and Tocilizumab (anti-IL6R) leading to approval in a number of indications. In addition, he led the immunology biomarker group. He has been with GlaxoSmithKline since April 2012 as Vice President and Medicine Development Leader. He is also the head of the clinical development group for the immuno-inflammation therapy area and serves as the liaison for development activity in China and Japan. He is the industry chair of the MRC ABPI RA MAP consortium.

Professor Peter Weber
Professor Peter Weber received his Ph.D. in Nutritional Sciences from the University of Bonn, Germany and his M.D. from the University of Münster, Germany. After working for two years at the 'Research Institute of Child Nutrition', Dortmund, Germany he trained in Internal Medicine with a subspeciality in endocrinology at the University of Mainz, Germany. He is a Professor of Nutrition at the University of Stuttgart-Hohenheim, Germany and gives lectures in Human Nutrition and Health. He has more than 70 peer-reviewed publications in the field of iodine deficiency and goiter, thyroid diseases, metabolic syndrome, postprandial lipid metabolism, vitamin K, vitamin status of populations, the role of vitamins and polyunsaturated fatty acids in human health and he is a co-editor of a book on vitamins. His scientific interests include the role of micronutrients in the prevention of diseases, nutritional status in risk groups such as elderly and in the emerging topic of Nutrition Security. In 1993 he joined Hoffmann-La Roche in New Jersey, USA and in July 2004 he was appointed Corporate Scientist for Human Nutrition & Health in DSM Nutritional Products in Kaiseraugst, Switzerland which includes the responsibility for the DSM Corporate Research Program for Nutrition.
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Bio-Entrepreneur Programme

Have you identified an area of unmet clinical need?

The ‘Bio-Entrepreneur Programme’ is a dynamic new initiative that has been designed to support entrepreneurs, innovators and start-ups develop their innovations for better healthcare whether they are software related, medical devices, diagnostics or therapies.

The programme will provide tailored mentoring support from a mentor to address a specific issue or barrier relating to the development of your business idea.

How can the programme help me?

- **Healthcare Market Feasibility**  
  Viability and commercial feasibility of the business concept for the NHS and wider healthcare markets

- **Applied Research**  
  Focused applied research project contributing to the development of new products, services, systems.

- **New Product Development**  
  Assistance with design or development of a new product

- **Clinical Validation**  
  Validating product for clinical effectiveness including advice and assistance with IRAS and MHRA regulatory approvals

- **Testing**  
  Use of University facilities or expertise in the testing of raw materials or finished products

- **Prototyping**  
  Physical prototype of a new product or service developed

Innovate for Better Health!

If you are interested in participating in the Bio-Entrepreneur please contact info@c-tric.com

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Have you identified an area of unmet clinical need?
What is C-TRIC?
The Clinical Translational Research and Innovation Centre (C-TRIC) is a unique facility promoting and facilitating translational and clinical research, the primary objective of which is to reduce both the time to market and the costs associated with research and development of innovative health technologies, medical devices and therapeutics. C-TRIC’s unique infrastructure and key support staff facilitate clinical research and innovation, enabling the streamlining of developments from the laboratory to the market place through a focused ‘bench to bedside’ approach. C-TRIC creates the opportunity to develop and exploit partnerships between academic researcher, clinical practitioners and industry.

Innovative Design, Optimal Location
C-TRIC has been specifically designed to ensure the co-location of skilled staff in a purpose built facility to provide high quality support for clinical research, clinical trials and medical technology development and evaluation. This ensures optimal workflow streams, biological sample integrity and quality assured sample handling and storage. C-TRIC is situated on a major acute hospital site incorporating a broad range of clinical services with an active clinical research culture ideal for staging clinical research and trials. The locality has a stable and homogeneous population facilitating longitudinal and family based research studies. It draws on the highly rated academic biomedical, bioengineering, Connected Health and ICT expertise of the nearby University of Ulster campuses. C-TRIC strongly complements the University’s research and innovation capability in personalised medicine.

C-TRIC Overview
C-TRIC provides specialist workspace and services for academic researchers, clinical researchers and the biotechnology industry, including the pharmaceutical, bio-pharmaceutical, medical device and healthcare technology sectors. C-TRIC is comprised of two key components, a Clinical Research Facility and a Healthcare Innovation Hub.

Clinical Research Facility
C-TRIC is licensed to handle, process and store clinical materials and data. C-TRIC facilitates clinical trials (Phases I-IV) and evaluations of novel therapeutics, diagnostics, medical devices and technologies and is linked to the UK National Health Service and wider European healthcare markets.

Clinical research resources
- In house clinical trial capability including clinical study design, clinical knowledge, clinical trial statistics, and access to wider clinical research networks
- Access to clinical governance staff providing an invaluable steer through the governance and ethical approvals process
- Access to skilled research nursing staff, to record, collect and collate clinical data, provide phlebotomy services, collect and label clinical materials
- Access to skilled biomedical scientists to process, analyse and store clinical materials.

Healthcare Innovation Hub
C-TRIC provides clients with innovation services, specialist workspace, incubation support for fledgling life and health technology enterprises and networking opportunities.

Specialist workspace
- Laboratory space
- Office accommodation
- Clinical Storage space
- Clinical Sampling space

Innovation services
- Access to world class scientific and academic knowledge in biomedical science, bioengineering and ICT
- Early access to technology licensing opportunities
- Advice on knowledge transfer programmes

Incubation support
- Market validation through facilitated access clinical expertise and advice on healthcare economics
- Access to healthcare innovation programmes
- Specialist advice on R&D support, intellectual property and finance
Streamlining healthcare innovation from concept to point of care

About C-TRIC

Networking

C-TRIC hosts regular workshops and networking events aimed at maximising the potential for collaboration across the Academic, Business, and Clinical interface.

Networking and a culture of collaboration is facilitated by access to a variety of communal break-out areas and meeting rooms including:

Conference room (with video conference/data projector)
- Seminar room
- Meeting room
- Break-out and kitchen area

Locating at C-TRIC

C-TRIC is a multi-use flexible facility of approximately 1000 sq metres (9000 sq ft). Providing secure and flexible accommodation for our clients and offers renewable licenses from a minimum of six months with the option to break on two month’s notice.

www.c-tric.com

Floor Plan

- Commercial Clients/Lettable Space
- Break Out/Meeting Space/Lettable Space
- Clinical Rooms & Clinical Research Nurses
- C-TRIC support Staff/R&D Office
- Laboratories/Lettable Space

University of Ulster Campuses:
- Magee
- Belfast
- Coleraine
- Jordanstown
- Derry / Londonderry
- Belfast
- Altnagelvin Hospital
- Airports

For further information please contact:

C-TRIC, Altnagelvin Hospital campus, Glenshane Road, Derry/Londonderry
BT47 6SB Northern Ireland, UK

t: +44 (0) 28 7161 1249
e: bp.henderson@c-tric.com
w: www.c-tric.com
ABSTRACTS (POSTER PRESENTATIONS)

Poster 1

TITLE: RNAsing identifies therapeutic candidates for the treatment of oral dysplasia

AUTHORS: Lucy F. Stead1*, Caroline Conway1,2**, Preetha Chengot1, Catherine Daly1, Rebecca Chalkley1, Lisa Ross1, Alastair Droop1 and Pamela Rabbitts1

AFFILIATIONS: * These authors contributed equally to the work<br />^ Presenting author<br />' 1. Leeds Institute of Cancer and Pathology, University of Leeds, LS9 7TF, UK<br />' 2. Now at Northern Ireland Centre for Stratified Medicine, School of Biomedical Sciences, University of Ulster, Coleraine, Co. Londonderry, BT52 1SA, UK. E-mail: c.conway@ulster.ac.uk, Tel: 02871611145<br />

BACKGROUND: Oral squamous cell carcinoma (OSCC) is one of the top ten most prevalent cancers in the world. Prognosis is poor and quality of life is commonly reduced for patients who survive. Most OSCC progresses via a premalignant stage called dysplasia. Effective treatment of dysplasia prior to malignant transformation, or the ability to predict the 10-20% of dysplasias that will progress to OSCC, is an unmet clinical need.

MATERIAL METHODS: To further understand the biology of dysplasia progression, and attempt to identify therapeutic targets and markers of early disease, we performed RNA sequencing on 19 formalin fixed paraffin embedded matched patient trios: normal oral mucosa, dysplasia and associated OSCC. Our approach ensured that we captured strand-specific information on both coding and non-coding genes in matched samples for the first time. We performed differential gene expression, principal component and correlated gene network analysis using these data.

RESULTS: This is the largest study of matched patient trios, constituting only samples from the oral cavity in non-HPV infected patients where all dysplasias are associated with progression to OSCC, that has been performed to date, and the first to include long non-coding RNAs.

CONCLUSIONS: We have identified several novel coding and non-coding candidates with potential involvement in oral dysplasia development and malignant transformation which merit further investigation and highlight two potential therapeutic approaches for the treatment of oral dysplasia that resulted from our analysis: the application of oncolytic viruses that heighten the host immune response, and the use of small molecule HOX gene product inhibitors.

Poster 2

TITLE: Dominant and Recessive Forms of Familial Hypercholesterolemia in Lebanese Families: The need for a more personalized approach

AUTHORS: Mélodie Chémaly1, Youmna Ghaleb1,2, Sandy Elbitar1, Petra El Khoury3,4 Marie Lynn Moussali1, Jean-Pierre Rabès2,5, Mathilde Varret2, Catherine Boileau2,5, Marianne Abifadel 1,2

AFFILIATIONS: 1Laboratoire de Biochimie et de Thérapies Moléculaires, Faculté de Pharmacie et Pôle Technologie Santé, Université Saint-Joseph, Beirut, Lebanon ; 2INERIM U698, hôpital Bichat-Claude Bernard, France ; 3INERIM UMR5939, Hôpital de la Pitié, Paris, France ; 4Université Pierre et Marie Curie–Paris 6, Paris, France ; 5Laboratoire de Biochimie et de Génétique moléculaire, hôpital Ambroise-Paré, APHP.

BACKGROUND: Autosomal dominant Hypercholesterolemia (ADH) is associated with mutations in the LDLR, APOB and PCSK9 gene. Whereas autosomal recessive hypercholesterolemia (ARH) is very rare and is due to mutations in the LDLRAP1 gene. Familial Hypercholesterolemia (FH) is very frequent among the Lebanese population because of the presence of the “Lebanese allele/mutation” in the LDLR gene: p.C681X presumably with a founder effect, and a high level of co-sangunuity leading to a high frequency of homozygotes. The aim of our study was to investigate the genetic causes of FH in Lebanese families with consanguinity and homozygotes patients with severe phenotype.

MATERIAL METHODS: Fifteen subjects from three different families suffering ADH were recruited from Northern and Southern Lebanese regions. The p.C681X mutation in exon 14 of the LDLR gene was investigated by sequencing. The PCSK9 gene was also sequenced in order to determine the impact of some polymorphisms in this gene on cholesterol levels in ADH patients sharing the Lebanese mutation. Two subjects from a family with known ARH were also recruited and mutations in the LDLRAP1 gene were investigated by sequencing.
RESULTS: The Lebanese mutation of the LDLR (p.C681X) was identified in all 15 tested subjects from 3 non related families. Homozygotes (n=6) had extremely high levels of LDL-cholesterol as compared with the heterozygotes (n=9). Furthermore, an in frame insertion of Leucine (p.Leu21dup) to the stretch of 9 leucines in exon 1 of PCSK9 is associated with a reduction of LDL-cholesterol levels in ADH patients heterozygous for the p.C681X mutation in the LDLR confirming our previous results (Abifadel et al. 2009). A nonsense mutation in the LDLRAP1 gene p.Q136X was identified in 2 patients from a family presenting with ARH which is confirmatory of a previous report of his mutation in a Lebanese family (Garcia et al, 2001).

CONCLUSIONS: These results confirm that the high frequency of FH among the Lebanese population is due to the Lebanese mutation in the LDLR but that recessive forms also exist. It highlights the importance of the homozygous presentation. The genetic results should be considered when assessing cardiovascular disease risk, prevention and therapeutic options, especially in young patients suffering from FH.


Poster 3

TITLE: Personalising diabetes education

AUTHORS: Dr. Karen McGuigan, A1., Dr. Geraldine Horigan, B2., & Professor Vivien Coates, B2

AFFILIATIONS: A1. School of Sociology, Social Policy and Social Work, Queens University, Belfast; 6 College Park, Belfast, BT7 1LP.
Telephone: 077 450 24 923
email: k.mcguigan@qub.ac.uk
B2. School of Nursing, University of Ulster, Magee Campus, Derry, BT48 7JL

BACKGROUND: Type 2 Diabetes (T2D) is considered to be “one of the major health challenges of the 21st century” (Ferrand et al., 2008). The condition is associated with serious, long-term health issues and complications (Khunti et al., 2008). With the increased incidence of T2D and predicted growth in the number of cases in future, it is important to ensure the condition is managed effectively to prevent rapid progression after diagnosis. It is estimated that people with T2D provide 95% of the care they require on a daily basis (Pibernek-Okanovic, et al., 2004) which is in keeping with Department of Health, Social Services and Public Safety (2013) transforming care policy that recommends patients are enabled to manage their own condition.

Research to date has highlighted differences in how males and females self-manage their diabetes, with regards to aspects including glycemic control, diet and exercise (Whittmore et al., 2004). The reasons for this may result from differing learning styles, knowledge, support networks and life demands. Therefore it is important that we understand the individual differences, needs, motivations and awareness of patients in relation to their condition, to tailor programmes of education and provide the support which address these differences.

MATERIAL__METHODS: The aim of the study was to investigate how men and women diagnosed with T2D (≤55 years of age) self-manage their diabetes alongside their other life roles. 9 males and 9 females who attended a structured diabetes education programme in the past 3 years were recruited from the Western Health and Social Care Trust (WHSCCT). Semi-structured interviews explored participants’ general characteristics, feelings, behaviours, commitment, experiences, interactions and the perceived barriers that impact on the self-management of their diabetes. Recorded data were transcribed and analysed to detect emerging themes. Descriptive statistics were used to describe the sample.

RESULTS: Findings show marked differences in how males and females self-manage their condition, with family eating habits more likely to change in response to male diagnosis and education, whilst females were likely to change their own diet, but minimise impact on family habits. Differences also existed within the sample in relation to their understanding of their condition even after attending the structured diabetes education programme. One key theme that spanned males and females was the number of participants reporting depression prior to, or in response to, their diagnosis.
CONCLUSIONS: The results indicate that education does improve understanding of patients, however the nature of the education should be tailored to a greater degree to reflect the needs, capacity and circumstances of males and females. There are messages for those designing diabetes education programmes, reflecting differing motivations across genders. The issue of depression may also impact upon the patients’ ability to engage with education around their illness, and may be a barrier to effective assimilation and understanding. Further research examining needs of males and females in relation to their diabetes is essential, including the development of personal, even gender specific education programmes. A challenge exists in developing personalised provision within current economic constraints.


Poster 4

TITLE: Plasma modified electrospun biomaterial membranes - a personalised approach to heart valve regeneration

AUTHORS: P.J. Porter, M.M. McCafferty, B.J. Meenan and G.A. Burke

AFFILIATIONS: The Biomaterials and Tissue Engineering Research Group, NIBEC, University of Ulster, N. Ireland

BACKGROUND: Tissue engineering is rapidly emerging as an alternative cell-based approach for the partial or complete replacement of damaged organs. These in vitro generated tissue equivalents represent the next logical step towards the development and regeneration of laminar organised tubular organs in modern personalised medicine. Biomaterial scaffolds that can mimic the extracellular environment and encourage cellular organisation and tissue function are essential for the future development of tissue engineering and regenerative medicine. The current reliance on sources of animal extracellular matrix (ECM) is not sustainable so the production of viable bioprosthetic structures that accurately replicate the natural human condition are essential. In response to this important clinical need, scientists at the University of Ulster have developed an innovative technology (RegenaGraft) for the production of aligned and non-aligned scaffolds derived from natural and synthetic polymers. The result of this technology is the formation of a scaffold matrix that is attractive to cells and capable to directing the formation of ECM, which could be used for a range of desired clinical application for the personalised treatment of cardiovascular, dermatologic and ophthalmic diseases.

MATERIAL__METHODS: Polymeric electrospun (ES) membranes were manufactured using the co-polymer Poly-L-Lactide/Caprolactone (PLCL) (PURASORB® PLCL 7015, 70/30 L-lactide/caprolactone). A 10% weight by volume (w/v) solution of PLCL was prepared in 9:1 v/v solution of chloroform/dimethylformamide (DMF). A high voltage DC current of 18kV was applied to the dispensing needle, with a polymer flow rate of 1ml/hour. Fibres were collected on an adjacent static stage collector in a random orientation for 10 minutes for each membrane. The treatment technique chosen for the surface modification of PLCL electrospun membranes was an atmospheric pressure plasma treatment, dielectric barrier discharge (DBD). A range of advanced analytical techniques were used to evaluate the physical and chemical properties of electrospun membranes before and after DBD treatment. Scanning electron microscopy (SEM), contact angle, atomic force microscopy analysis (AFM) and mechanical strength testing were used to assess the physical properties of the electrospun membranes. Fourier transform infra-red spectroscopy (FTIR) and X-ray photoelectron spectroscopy analysis (XPS) were performed to characterise the attendant chemical composition. The propensity of relevant human cell sources to attach and proliferate on untreated and DBD treated electrospun PLCL membranes was examined by a range of biological assays.

RESULTS: PLCL electrospun membranes with a random fibre alignment were fabricated, exhibiting an average fibre diameter of 2.1 ± 0.14µm and average membrane thickness of 58.3 ± 12µm. DBD plasma treatment successfully modified the surface of the fibres, which resulted in a significant decrease in contact angle compared to the control. Furthermore, DBD plasma treatment altered both the surface chemistry and topography of the fibres, which caused an increase in surface oxygen content and surface roughness without affecting the bulk properties of the PLCL electrospun membranes. DBD plasma treatment of PLCL electrospun membranes can significantly affect the cellular attachment and proliferation of relevant cells, which was confirmed by cell proliferation data that indicated there was significantly more cells on the DBD plasma treated membranes compared to the control (untreated) membranes. It was also established that DBD plasma treatment enhances the maturation and monolayer formation of the investigated cells.
CONCLUSIONS: It is evident from this data that the subtle difference in the fibre surface characteristics induced by the plasma modification can enhance cellular attachment, proliferation and maturation. These surface modified fibres also have the ability to support the function and maintenance of their phenotype, as indicated by the retention of specific markers over a prolonged culture period.

D’Sa RA, Burke GA, Meenan BJ. 2010b; Protein adhesion and cell response on atmospheric pressure dielectric barrier discharge-modified polymer surfaces. Acta Biomater 6: 2609-2620.  

**Poster 5**

**TITLE:** Computational models of ganglion cells for visual prostheses

**AUTHORS:** Dermot Kerr, Sonya Coleman, Martin McGinnity, Philip Vance

**AFFILIATIONS:** A1, A2, A3, A4 Intelligent Systems Research Centre, School of Computing and Intelligent Systems, University of Ulster, Magee, BT48 7JL  
A3 Nottingham-Trent University, Clifton Campus, Nottingham, NG11 8NS.

**BACKGROUND:** Visual prostheses are devices that have been developed to treat loss of visual perception (i.e. blindness). The basic idea of all visual prosthetic devices is to create an imaging system that artificially injects processed signals into the biological visual processing stream.

**MATERIAL METHODS:** Most systems consist of two main modules – internal and external. The external module captures the visual stimulus, processes and transmits the information to the internal module. The internal module then communicates directly with the target tissue. Image capture is generally performed by a photodiode array, CCD or miniaturised camera. The processing system modifies the input image so as the stimulus that is sent to the brain contains enough information for the user.

**RESULTS:** The Argus II epiretinal implant is currently undergoing clinical trials. It consists of an epiretinal multi-electrode array with 60 independently controllable micro-electrodes and an external camera. “Vision” that has been restored with the device is not the same as the natural vision experienced by the patient prior to blindness and can be described as “some what pixelised” vision. The Learning Retinal Implant consists of a retinal encoder mounted on glasses that approximates the centre-surround receptive field properties of retinal ganglion cells and replaces some basic retina processing abilities with individually tuneable spatio-temporal filters.

**CONCLUSIONS:** Visual neuroscience research has identified that the computation of specific functional visual characteristics such as texture motion detection, approaching motion detection, orientation detection, contrast detection and motion extrapolation along with gain control and edge enhancement are carried out within the retina. To maximise biological compatibility, prosthetic devices should replicate all these functions and produce biologically compatible neural responses. The VISUALISE project is investigating and modelling the functional processing capabilities of specific retinal ganglion cells. We propose that these retina models will be suitable for transforming captured images into neural responses in prosthetic devices.

**Poster 6**

**TITLE:** Investigation into auditory processing of pitch and volume using Magnetoencephalography (MEG).

**AUTHORS:** Gault, Richard, 1; McGinnity, T.M., 1; Coleman, Sonya, 1.

**AFFILIATIONS:** 1. Intelligent Systems Research Centre, University of Ulster, Magee, BT48 7JL gault-r2@email.ulster.ac.uk

**BACKGROUND:** Tinnitus is the conscious experience of a phantom noise originating in or around the head area which is apparent in 10-15% of the population. Approximately 90% of people’s tinnitus coincides with hearing loss with the remaining tinnitus population hypothesised to have some form of hidden hearing loss [1]. Tinnitus sufferers have been found to have abnormal neural activity which is thought to play an important role in helping researchers understand the mechanisms underpinning the phantom percept [2]. There are many potential causes for the generation of tinnitus [3], for instance hearing loss or anaemia. Experimental design in this area is challenging as the diversity and lack of mutual exclusivity of these causes make it difficult to isolate neural activity resulting specifically from the tinnitus sensation. The descriptors of tinnitus are primarily its quality or tonality, its volume and its impact on a person’s quality of life. The Initial
investigation will look at how sound is processed in subjects with no tinnitus or apparent hearing loss; specifically the pitch and volume of sound. Learning how sound from an identifiable source is processed will enlighten future tinnitus based studies to understand the perception of the phantom sound.

MATERIAL__METHODS: Neural activity will be observed using Magnetoencephalography (MEG). MEG is a non-invasive and passive imaging technique with sub-millisecond temporal resolution whilst maintaining good spatial resolution. With high spatiotemporal resolution MEG can record spiking behaviour in detail and give a good location of the source of synchronous activity. The data will be analysed using similarity measures from multivariate analysis and classification techniques to distinguish subtleties in the neural responses.

RESULTS:

CONCLUSIONS: The study will be used to inform future investigations to the best areas to look for tinnitus specific activity with the aim of understanding the factors which impact upon the tinnitus perception.


Poster 7

TITLE: Role of the endocrine pancreas in the development of Cystic Fibrosis-related Diabetes

AUTHORS: Manderson Koivula F1, Robinson J2, Yates R2, McClanaghan N1, Harper A2, Kelly C1

AFFILIATIONS: 1Centre for Stratified Medicine, School of Biomedical Sciences, University of Ulster, UK<br />
2Institute for Science and Technology in Medicine, Keele University, UK

BACKGROUND: Cystic fibrosis is an autosomal recessive disease characterised by mutations in the Cystic Fibrosis transmembrane-conductance regulator (CFTR) gene. These mutations alter fluid secretion in the lungs and other organs and the majority of patients die from pulmonary disease (Moran et al. 2011). CF-related diabetes (CFRD) is the most significant co-morbidity, accelerating lung decline (Yeh et al. 2008). Recent evidence has implicated a role for CFTR in the development of the endocrine pancreas. This study will address the hypothesis that loss of functional CFTR contributes to the development of CFRD through beta-cell dysfunction and apoptosis.

MATERIAL__METHODS: BRIN-BD11 and MIN6 cells were used. Native CFTR was silenced using siRNA and cell viability assessed using MTT assay. Acute glucose-induced insulin secretion was evaluated by exposing cells to rising D-glucose concentrations. Insulin release was measured using ELISA.

RESULTS: There was no significant difference in cellular viability between control and CFTR-deficient cells. Control cells showed a dose-dependent increase in glucose-induced insulin release. Whilst a significant difference in glucose-induced insulin secretion was not observed at basal glucose concentrations, CFTR-deficient cells displayed a significant impairment in insulin response to intermediate and high concentrations of glucose.

CONCLUSIONS: CFTR appears to play a significant role in the function of pancreatic beta-cells. Future work will examine how specific CFTR mutations affect beta-cell function and survival, and will lead to the development of a stratified approach for the specialised treatment of CFRD.


Poster 8

TITLE: Fluorescence in situ hybridisation reveals cellular pattern of a genomic amplification discovered by next generation sequencing
BACKGROUND: Fluorescence in situ hybridisation (FISH) enables assessment of chromosomal aberrations in individual cells and heterogeneity in cell populations. The ability to observe a chromosomal rearrangement in a single cell potentially gives this a higher sensitivity than most next generation sequencing (NGS) approaches. We aimed to produce independent validation of an amplification identified from NGS and elucidate its pattern of distribution both within nuclei and across a cell population.

MATERIAL__METHODS: From a single patient with oral cancer, six epithelial tissue samples were obtained. These included histologically normal, dysplastic and cancerous samples as well as a matched lymph node metastasis. DNA was extracted using Qiagen kits and processed to a sequencing library with the NEBNext DNA prep. These were then multiplexed and sequenced on the Illumina HiSeq 2000 at low coverage to produce copy number variation data for each DNA sample. Using a targeted Cytocell probe, FISH was performed on sections of all six tissues and images produced following well-established methods.

RESULTS: Using CNAnorm to analyse the CNV data, two tumour DNA samples demonstrated an amplification of 17q12. A Her2 (17q12) probe was applied and confirmed the presence of this amplification. It also revealed allelic imbalance of the amplification, which was not discernible from the CNV sequencing data.

CONCLUSIONS: FISH can provide independent confirmation of amplification inferred from NGS data as well as information on the distribution of this amplification. Integrating NGS and FISH has the potential to uncover patterns of genomic disturbance, which could make NGS discoveries more accessible to clinical laboratories.

Poster 9

TITLE: CD22 Activation in Rheumatoid Arthritis Patients Receiving First Biologic treatment.

AUTHORS: David Gibson1, Cathy McGeough1, Michael Bustard1, Philip Gardiner2, Gary Wright3, Tony Bjourson1.

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BACKGROUND: Rheumatoid arthritis (RA) is a chronic inflammatory disease affecting joint tissues. Current anti-TNFα biologics can effectively suppress inflammation and restore joint function. However, most biologic drugs have immunogenic potential resulting in the development of anti-drug antibodies (ADA’s). Interfering ADA’s can reduce drug efficacy by up 70%, resulting in unchecked increases in disease activity. When activated in B cells, CD22 can limit the intensity antibody responses. This initial study investigates CD22 activation and levels of antidrug antibodies in an inception cohort of biologic naive RA patients.

MATERIAL__METHODS: Archived samples from Rheumatoid Arthritis patients who received anti-TNFα biologic drug were used (n=14): sera and buffy coats collected at T=0 and T=6. Anti-drug antibody positivity was investigated by bridging assay. Activated CD22 was immunoprecipitated from buffy coats and confirmed by phospho-specific Western blot.

RESULTS: CD22 phosphorylation levels were markedly reduced in the subset of immunogenic patients at T=6. ADA’s were detected above assay cut-off in a subset of immunogenic patients.

CONCLUSIONS: A subset of RA patients with an immunogenic phenotype at higher risk of developing ADA’s was identified. This population displayed reduced levels of CD22 activation. Current research is focused on quantifying the amounts and activity levels of enzymes responsible for creating ligands which activate CD22. It is postulated that mutations in these enzymes could cause the loss of drug tolerance. These genetic fingerprints could be used develop stratification tests to reliably identify those at risk of developing drug resistance.


Poster 10

TITLE: Towards stratifying rehabilitation of stroke patients through measuring causal brain connectivity

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BACKGROUND: Robotic exoskeletons are often used for poststroke neuro-rehabilitation. However, such systems have so far yielded only mixed results in benefiting the clinical population. Therefore, there is a need to investigate how gait learning and de-learning are characterised in brain signals through an appropriate brain-computer interface (BCI). In particular, we apply partial Granger causality (PGC), an advanced data-driven approach that searches for causality in cortical brain areas [1]. This method effectively mitigates confounding influences caused by endogenous and exogenous inputs in brain connectivity.

MATERIAL METHODS: Following our previous work [2], PGC analysis was conducted over 10-channel artefact-free EEG segments to investigate the directed neural connectivity among relevant brain regions. Data were recorded from six healthy male adults while performing robot-assisted gait training, consisting of ten sequential trials: (1) a 10-min free treadmill walking without the robot; (2) a 5-min baseline test in transparent control mode; (3-6) four 10-min different training bouts; (7-9) three 5-min post-training bouts; (10) a 5-min free treadmill walking. Prior to each trial, one minute activities (resting stage) were considered as the benchmark for stability check. Moreover, during each training session, subjects received haptic and visual guidance from robotic system.

RESULTS: Results revealed strong causal interactions between lateral motor cortical areas during the resting stage, which were consistent across sessions and subjects. Moreover, we found two distinct causal effects in the fronto-parietal area during learning sessions and the centro-parietal area during de-learning sessions. Those effects may relate to the rapid visual processing during the learning and causal “top-down” cognitive control during de-learning processes.

CONCLUSIONS: We demonstrated the usefulness of the PGC technique in revealing the brain connectivity patterns that evolve during robotic gait training. It showed convergence towards a consistent connectivity configuration over time. The method is computationally efficient and can be applied to real-time BCI and neuro-rehabilitation applications, and ultimately help stratify the progress and effectiveness of the rehabilitating process.


Poster 11

TITLE: Developing smart bandage materials for the management of chronic wounds

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BACKGROUND: Bacterial contamination of chronic wounds has long been a major concern for those involved in the management of diabetic foot disease (DFD). The latter is an increasingly common complication of diabetes whose
treatment has a profound impact on both patient and healthcare resources. While there has been considerable activity in the development of wound dressings that aim to minimise bacterial contamination and aid the healing process, the majority are passive and possess little or no diagnostic capability. The present communication details the results of an investigation into the use of a smart bandage which can permit electrochemical interrogation of the wound environment and therein offer the possibility of more timely and effective interventions in the management of the wound.

MATERIAL__METHODS: A conductive composite polymer based on polyethylene doped with carbon that could be integrated within a conventional wound dressing was developed. It was envisaged that the carbon component would provide the framework for electrochemical transduction enabling quantitative information on key biomarkers associated with wound healing to be extracted through an appropriate electronic monitor – worn either by the patient or connected at the time of consultation.

RESULTS: The surface morphology of the resulting films was analysed and the electrode performance in relation to monitoring a range of key biomarkers was optimized. A novel approach to measuring pH and wound severity was developed.

CONCLUSIONS: The polyethylene mesh described, although at a preliminary stage, has been shown to be capable of monitoring the wound environment and the approach advocated provides some strong foundations on which to remove the subjective nature of diagnosing wound severity. The mechanical flexibility of the polyethylene is ideal for incorporation within existing dressing materials and could be produced in bulk at relatively low cost, a pre-requisite given the frequency with which wounds dressing need to be replaced.

Poster 12

TITLE: The NLRP3 inflammasome: A potential target for inflammatory disease

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BACKGROUND: Inflammation is a key component of many diseases and there is currently no effective specific anti-inflammatory therapy.1,2 The NLRP3 inflammasome has emerged as a central regulator of the inflammatory process and recent clinical studies have highlighted its increased expression in patients with various diseases including, Atherosclerosis, Diabetes, Alzheimer's disease, Parkinson's disease and Inflammatory Eye Conditions.3-9 It is the key protein in the mechanism by which IL-1β production is regulated. This present study aimed to investigate the cell signaling processes involved in NLRP3 inflammasome activation using in vitro models of inflammation including Conjunctivitis, Atherosclerosis and Type 2 Diabetes.

MATERIAL__METHODS: To investigate the signaling pathways involved in NLRP3 inflammasome activation, THP-1 cells or conjunctival goblet cells were treated with a caspase-1 inhibitor, siRNA against the scavenger receptor CD36 or siRNA against the endocannabinoid receptor CNR1 prior to stimulation with Staphylococcus Aureus (S. aureus), Oxidised LDL or High Glucose. Other receptors including the purinergic receptors P2X7, P2X4 and Toll-like receptor 2 known to be involved in NLRP3 inflammasome activation were also investigated. NLRP3 inflammasome components were measured using western blot and quantitative real time PCR.

RESULTS: Toxin-containing S. aureus, which activates the NLRP3 inflammasome, increased the expression of the inflammasome proteins NLRP3, ASC and pro- and mature caspase 1 in conjunctival goblet cells. The biologically active form of IL-1β was detected in goblet cell culture supernatants in response to S. aureus, which was reduced when the cells were treated with the caspase-1 inhibitor Z-YVAD. The purinergic receptors P2X4 and P2X7 and bacterial Toll-like receptor 2 were present and functional in conjunctival goblet cells. Preliminary results from the second part of this study confirm previous findings that the NLRP3 inflammasome is activated by oxidised LDL and high glucose in THP1 macrophages. Results however also revealed for the first time that THP-1 macrophages require both the CD36 and CNR1 receptors for optimal NLRP3 expression in response to oxidized LDL and high glucose. This is the first report of the involvement of endocannabinoid receptors in response to oxidised LDL and high glucose in macrophages.
CONCLUSIONS: These findings provide an insight into the mechanism of action of the NLRP3 inflammasome in inflammatory disease and prompt further exploration of this protein complex and its regulatory receptors as potential targets for prognostic and or therapeutic development in the strive towards a more personalized approach to inflammatory disease.


Poster 13

TITLE: The associations between conflict, trauma & suicidal behaviour in Northern Ireland

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BACKGROUND: Figures highlight an increase in the number of suicides in Northern Ireland (NI)[1]. There is a suspected connection between the post conflict context and increases in suicide rates[2]. Suicidal ideation and behavior give us an insight into the factors associated with death by suicide. Attempted suicide also represents an important cause of morbidity. Mental disorders are an important risk factor but most people with a mental disorder do not go on to die by suicide and many people who die by suicide have no recorded mental disorder[3]. It is therefore important to assess associations between suicide and other factors, such as trauma. The NI conflict offers an opportunity to examine the associations between trauma and suicidal behavior.

MATERIAL METHODS: This analysis used data from the NI Study of Health and Stress, part of the World Mental Health surveys (see: http://www.hcp.med.harvard.edu/wmh/). The study used a multi-stage, clustered, area probability household sample N=4,340, RR=68.4%[4]. The survey instrument was the WMH Composite International Diagnostic Interview (WMH-CIDI) [5]. This is a comprehensive, fully structured interview assessing mental disorders according to DSM-IV criteria. Suicidal behaviour was assessed using three questions on suicide ideation, plans and attempts.
Traumatic events were assessed in the PTSD section of the WMH-CIDI. Individuals were assigned to a conflict-related category if they experienced any of the following from 1968+: combat experience, peacekeeper in a place of war, unarmed civilian in a place of war, civilian in a place of ongoing terror, refugee, kidnapped, man-made disaster, beaten by someone other than parents or partner, mugged or threatened with a weapon, witnessed someone being killed or seriously injured, purposely caused injury or death, or saw atrocities. A proportion of traumatic events involving loved ones could be associated with the NI conflict; however, we did not categorise these event types as conflict-related. This is therefore likely to be a conservative estimation of conflict-related trauma.

RESULTS: Women are more likely than men to endorse suicide ideation (10.6% vs 7%). Similar proportions of men and women report having a plan. Women are more likely than men to make a suicide attempt (4.3% vs 2.3%). The proportion of those with ideation who attempt is 41.4% for women and 33.2% for men, 62.0% of women and 38.7% of men who make a plan also attempt.

People with mood, anxiety and substance disorders are more likely than those without, to endorse suicidal behaviors. The risk for people with mood disorders is 30.2% for ideation, 9.1% for plan and 12% for attempt.

Individuals who have had a traumatic event have an elevated risk of suicidal ideation, plans and attempts. People who had a conflict-related traumatic event were more likely to have suicidal ideation and plans. However, people who had experienced conflict-related traumas were less likely than those who endorsed other traumatic event types to have attempted suicide.

The highest odds ratios for suicidal behaviours are for people with any mental disorder. However, the odds of ideation and attempt remain higher for people with conflict and then non-conflict-related traumas. The odds of suicide attempt are higher for people who have only non-conflict-related traumas compared with the other groups.

CONCLUSIONS: People exposed to conflict-related traumas are also exposed to other factors which protect against suicide attempts. Tomlinson [2] argued that, in keeping with Durkheim’s theory, the strong social networks which characterized NI during the conflict protected against suicide. However, this contradicts the finding that people with a conflict-related traumatic event have higher rates of suicidal ideation and suicide plans.

An alternative explanation is that those who are exposed to conflict-related traumas are more likely to die following their first suicide attempt and are therefore missing from the NI Study of Health and Stress. People may be more likely to make a fatal suicide attempt or choose a more lethal means if they have been habituated (following repeated exposure) to pain, violence and/or death [3,7].

Together, these theories suggest that those with a conflict-related traumatic experience are more likely to die following their first suicide attempt. However, it is only through the collection and analysis of valid and detailed data on deaths by suicide in NI that this hypothesis may be tested.

The results are based on retrospective recall in a small sample of suicidal individuals in the NI population and as such must be interpreted with caution.


Poster 14

TITLE: Palliative care needs of caregivers’ for people living with advanced heart failure - a systematic narrative review of the literature

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BACKGROUND: The important contribution of palliative care (PC) for non-malignant conditions, such as heart failure (HF) is increasingly recognised. Despite this, evidence suggests PC services are underused by this group of patients. Caregivers play a pivotal role in facilitating the care for people living with HF, yet the specific needs of this group has received little attention. Aim: To explore the experiences and needs expressed by carers of people living with advanced HF.

MATERIAL & METHODS: Six databases (CINAHL PLUS, Cochrane, EMBASE, Medline, PsychInfo, SCOPUS) were systematically searched to identify relevant journal articles using specific index terms. Articles were included for review if the following criteria were met: (1) peer reviewed (2) published 2003-2014 (3) English language (4) original research with a qualitative methodology that explored PC needs expressed by carer’s of people living with HF. A total of three hundred and sixteen articles were retrieved and after removing duplicates, scanning titles, abstracts and full text, fourteen relevant peer-reviewed articles were identified. Data were extracted and quality assessed using the McMaster critical review form for qualitative research studies, before narrative synthesis was conducted.

RESULTS: Six of the included articles were conducted in the UK, six in the USA and one each in Sweden and the Netherlands. Sample size varied from three to forty-five caregivers and across all articles there was a total sample size of two hundred and forty seven carers, the majority of which were older female spouses. Ten broad categories emerged from which three key areas of support needs were identified: psychological support, practical issues and information and communication needs. Carers expressed the need for “time off” in order to attend to their own healthcare needs and to maintain a sense of normalcy. Access to respite care and support groups was suggested and the need for sensitive and open communication from healthcare professionals was expressed.

CONCLUSIONS: Carer’s needs initiate when the patient is diagnosed, they continue throughout the disease trajectory and into bereavement. Needs are continuously prioritised and reprioritised depending on the patients’ medical stability. A holistic approach is needed to support this group of carers, incorporating both HF and PC specialties. Further research is warranted to explore different methods of delivering information and to evaluate whether these reduce carer burden.


Poster 15

TITLE: Pre-clinical development of surface modified Titanium foams and bioactive glasses for orthopaedic applications

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BACKGROUND: Infection of joints following prosthetic implantation is a major clinical problem, requiring revision surgery and lengthy periods of incapacity. Our research involves the pre-clinical testing of Titanium (Ti) coated with metallic silver (Ag), a substance known for millennia to inhibit bacterial growth. Titanium is a long-standing clinically proven biomaterial, however the ability of Ti-Ag to inhibit the two most clinically relevant osteolytic pathogens (Staphylococcus epidermidis and Methicillin resistant Staphylococcus aureus [MRSA]), while promoting growth of cells responsible for bone growth is largely unexplored. In addition, there is an urgent unmet clinical need to develop biocompatible scaffolds capable of providing support for osteogenesis1; as particularly in long bones containing large defects (as a result of trauma, surgical resection or disease) the supply of donor bone is limited. Our group is evaluating the ability of bioactive glasses, to provide a scaffold for regeneration, while stimulating matrix deposition and ultimately degrading as the new bone remodels and heals2.

MATERIAL & METHODS: Microbiology

We seed implants with clinically relevant numbers of pathogenes and after 6 – 96 hours monitor the number of pathogens growing on Ti implants as compared to Ti-Ag implants. In addition, we quantify the formation of biofilms on the implants as a function of time.
In vitro
We seed implants with cells relevant to the successful regeneration of bone (osteoblasts, osteoclasts, endothelium & fibroblasts) and monitor the growth and differentiation of cells.

In vivo
All animal experiments are approved by local (UU) and national ethics committees (Home Office; current Project and Personal Licences). Following appropriate anaesthesia, a 2.5mm circular lesion is drilled in the lateral mid-tibial wall and a disc (either bioactive glass, Ti or Ti-Ag) inserted. Following a period of recovery from surgery of between 1 – 12 weeks, rats are euthanized and the tibiae sampled for histological, immunohistochemical, ultrastructural, stereological or x-ray computed tomographic analysis.

RESULTS: Microbiological analysis indicates that Ti-Ag samples significantly reduce pathogenic load after long-term exposure in vitro. In cell culture, endothelium, osteoblasts, osteoclasts and fibroblasts grew and differentiated on the materials. In vivo all materials were well tolerated and showed a high degree of bone ingrowth and subsequent remodelling.

CONCLUSIONS: These studies indicate that Ti-Ag is able to reduce pathogenic microbial load and support the growth of bone producing cells both in vitro and in vivo. Bioactive glasses can also support bone growth, while at the same time degrading and allowing the new bone to remodel. These results support the conclusions that these materials warrant serious consideration as a replacement for Ti alone in reduction of clinically relevant infection of joint replacement (Ti-Ag) and as a clinical alternative to homografting or cadaver harvested bone transplantation.


Poster 16

TITLE: A PERSONALISED HEALTHCARE APPROACH TOWARDS BEHAVIOUR CHANGE IN PRE-DIABETICS

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BACKGROUND: Background: Our aim is to examine the case for supporting behaviour change in pre-diabetic obese people in order to improve their health.

MATERIAL & METHODS: Objectives: The ambition of our proposed framework is to: bring together experts in different disciplines to address a common problem; that of contributory factors to obesity and the development of type 2 diabetes among these at-risk individuals.

Review of literature: A review of economic, technological and societal factors contributing to the obesity epidemic.

RESULTS: Discussion and proposed methodology: A framework to achieve health-related behaviour change within the target population through the collection, collation and analysis of situational, psychological and social data, is discussed. The proposed approach incorporates an innovative bespoke personalisation algorithm that translates an individual’s activities into quantifiable measurable benefits.

CONCLUSIONS: Conclusions: The proposed framework will draw upon the expertise and experience of a multi-disciplinary team and devise a solution that uses social media, and identifies real benefits for users, based upon the use of a
personalised assessment profile. The advice will be ‘failure-free’, based on a positive wellbeing perspective, and focus on changing people’s health-related behaviour.


Poster 17

TITLE: An evaluation of the clinical and economic impact of procedural packs in secondary care

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BACKGROUND: High Impact Interventions (HII) are based on compliance to key specific steps carried out for particular procedures and when performed in sequence help reduce the risk of infection (1). The lack of correct equipment prior to a procedure has been shown to reduce compliance to HII care bundles (1). Bespoke procedure packs promote adherence to the recommended procedural method, by ensuring the availability of all essential apparatuses (3). When combined with training and familiarity of the pack, it allows the practitioner to concentrate on technical aspects of the procedure while utilizing all equipment in the step by step manner in which the pack unfolds. In conjunction with procedural packs and training, feedback of error rates aim to highlight the need for continued compliance with HII’s.

The aim of the study is to assess the impact of two procedural packs, blood culture sampling and peripheral vascular catheter (PVC) packs, as they are introduced to clinical areas within total Antrim Area Hospital (AAH).

MATERIAL__METHODS: For PVC adverse event rates an audit tool was designed to monitor performance indicators and relevant particulars pertaining to the patient and practitioner, to include clinical adverse events (phlebitis, infiltration, extravasation, infection) and non-clinical adverse events (dislodgement, leaking). Baseline PVC data was collected over 24 weeks on surgical wards. Data was collected from paperwork associated with initiation and monitoring of PVCs and patient notes. Blood culture contamination data was collected from total AAH adult population to include relevant particulars pertaining to the patient, practitioner and blood culture specimen result. Data was collected on all positive blood culture results including true positive and contaminated results, with information drawn from blood culture specimen request forms, laboratory computer systems and microbiology paperwork.

RESULTS: Baseline PVC data showed an average of 57 completed PVCs recorded per week, however on average 13% of PVCs inserted required removal due to newly diagnosed clinical adverse events, with a further 24% removed due to dislodgement or leaking. The blood culture study was able to monitor the total BC contamination rate for the hospital and through details of the sample particulars identify the specific wards which show high incidence of procedural noncompliance.
CONCLUSIONS: The PVC data shows there is an under reported incidence of adverse events affecting up to 37% of PVC’s inserted weekly, with the blood culture study being able to highlight contamination hotspots for further investigation and training.


Poster 18

TITLE: A new primary preventative strategy for high grade serous ovarian cancer.

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BACKGROUND: Epithelial ovarian cancers (EOCs) are the most common cause of death from gynaecological malignancy in the developed world. EOCs comprise a heterogeneous group of neoplasms including serous (68%), clear cell (13%), endometrioid (9%) and mucinous (3%) pathological subtypes (1,2). Serous ovarian carcinomas are further divided into low-grade and high-grade serous ovarian carcinomas (LGSOc and HGSOC respectively) (3). Most deaths are attributable to HGSOC which is approximately 20 times more common than LGSOc (4).

The lifetime risk of developing EOC is 1 in 70 (1.4%) by 75 years of age (5). Currently, the overall survival at 5 years is 43% but if confined to the fallopian tube or ovary, the survival can be as high as 80–95% at 5 years (6). Despite recent advances in surgical technique and chemotherapy treatments, the disease continues to kill one woman every two hours in the UK.

Screening strategies have had limited impact to date because the pathogenesis of EOC has been poorly understood and no definitive precursor lesion has been identified.

MATERIAL__METHODS: The aim of this study is to define the pathogenesis of HGSOC and show that it arises from the distal fallopian tube. We identified six unique cases of HGSOC via the multi-disciplinary team at the Northern Ireland Regional Gynaecological Oncology Centre. Each case had full clinicopathological data and all were post-menopausal sporadic carcinomas. The cases each exhibited metastatic HGSOC, serous tubal intraepithelial carcinomatous lesions (STIC), normal tubal fimbriae and normal ovarian surface epithelium.

The relevant formalin-fixed paraffin embedded (FFPE) tissue samples were retrieved from the hospital pathology archive via the Northern Ireland Biobank following attaining full ethical approval (NIB11:005).

Ten 5 micron sections were taken from the tissue block of the following samples from each case: (i) normal ovarian surface epithelium, (ii) normal distal fallopian tube epithelium, (iii) STIC, (iv) HGSOC, and (v) omental metastases. Following macrodissection, RNA was extracted using the Roche HighPure® Kit. The RNA underwent a QA/QC protocol before full gene expression profiling was performed, using the Almac Xcel microarray platform (*)Almac Diagnostics, Craigavon, UK). The resulting data was then assessed by unsupervised clustering analysis and principal component analysis.

RESULTS: This analysis has revealed that the molecular profile of HGSOC is more similar to the fallopian tube epithelium than the ovarian surface epithelium. In addition, the STIC lesions cluster more closely to HGSOC indicating a common molecular origin. This data provides initial molecular evidence, and supports our hypothesis, that HGSOC is derived from the distal fallopian tube via serous TIC.

CONCLUSIONS: This study gives further evidence that HGSOC arises from the fimbriae of the distal fallopian tube. Although the majority of ‘ovarian’ carcinomas are of serous histological subtype, the heterogeneous group that make up EOCs are all frequently included in clinical and molecular research. However, we now know that they differ not only in morphology, but in their origins of carcinogenesis, particularly, and most importantly, at a molecular level. This has a significant impact on clinical outcomes, particularly in their response to chemotherapy. It is therefore appropriate and necessary to study high-
grade serous pelvic carcinomas as a distinct group and adopt a stricter inclusion criteria to this new histological subgroup - High Grade Serous Fallopian Tubal Carcinomas.

It is also appropriate to adopt primary prevention prevention strategies while we await an effective biomarker driven screening strategy. A recent epidemiological study in British Columbia, Canada, has shown that if the fallopian tubes were "opportunistically" removed more than 30% of ovarian cancers could have been prevented (7,8). Therefore, it is our opinion that prophylactic removal of fallopian tubes, with ovarian conservation, at the time of gynaecological, or other intraperitoneal surgery, should be offered to all women who have completed their families.


Poster 19

TITLE: Patient Self-Testing of INR using U-Tell software, patient empowerment within a service technology framework


AFFILIATIONS: A1, A2, A3, A9, A10 & A11 affiliation is with University of Ulster<br />
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MATERIAL METHODS: The study was a single centre pilot randomised controlled trial. Eligible patients presenting to the antiocoagulation clinic were randomised to undergo either guided self-testing with software support (n=39) or normal management through a hospital antiocoagulation clinic (standard care) (n=39)<br />
The intervention included software support through U-Tell INR, with a ROCHE Coagu-Check for patient self-testing and modified clinical support through the INR clinic within the Trust.<br />
The patients were regularly followed up and asked to complete a number of questionnaires including the EQ-5D-5L at regular time points.<br />

RESULTS: The data was examined for therapeutic benefit, satisfaction, health related quality of life and cost-effectiveness.
In the Standard arm and intervention arm, the Median (Range) number of visits was 11 (3 to 41) and 30 (11 to 39) respectively. The mean difference (SE) in time in therapeutic range (%) was -13.1 (3.5) using traditional method and -13.7 (3.5) using Rosendaal method. These results suggest that those in the intervention arm had a substantial improvement in TTR.<br />
Patient Self-Testing was found to be more costly than standard care (mean difference £264.23; 95% CI -4.65 to 533.11) and brought about a very small gain in QALYs (mean difference 0.01; 95% CI – 0.05 to 0.06), resulting in an incremental cost effectiveness ratio (ICER) of £26,423 per QALY gained. However, there was considerable variability surrounding the presence and magnitude of effectiveness and uncertainty analysis revealed that at threshold a willingness
CONCLUSIONS: Patient self-testing showed benefit in terms of satisfaction and quality of life, with increased time within therapeutic range, but at a cost. Further work is needed to refine the delivery and cost model and to determine key attributes that enable successful implementation of technology.

**Poster 20**

**TITLE:** Incomplete reprogramming in differentiated human cells following temporary loss of maintenance DNA methylation

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**BACKGROUND:** Much has been learnt regarding methylation reprogramming in mouse from DNA methyltransferase (DNMT) knockout and rescue embryonic stem cell lines. Mechanistic studies in human have relied instead on examining hypomorphic alleles in tumour cells, which are usually hypermethylated, transformed and aneuploid, or on using pharmacological inhibitors with broad specificity.

**MATERIAL METHODS:** We have instead generated an isogenic series of non-transformed, chromosomally stable hTERT-immortalised fibroblasts which have undergone a transient demethylation event due to specific targeting of DNMT1 and selection for spontaneous revertants.

**RESULTS:** Rescued cells show stable loss of methylation at the paternally methylated H19/IGF2 imprint control region (ICR) implicated in Beckwith-Weidemann/Silver Russell Syndromes. Likewise the SNRPN/SNURF ICR involved in Prader-Willi/Angelman Syndromes, which acquires methylation in oocytes, showed stable demethylation. This is consistent with a requirement for germline passage to reset imprints, providing the first mechanistic evidence that demethylation in adult human leaves a lasting trace at ICR. In contrast, methylation and transcriptional repression were fully restored at DAZL and SYCP3, which normally acquire heavy methylation post-implantation. FKBP6 and PIWIL1, which share some features with imprinted genes, showed incomplete reprogramming in certain revertant lines. Temporary depletion of DNMT3B did not result in the loss of methylation at DAZL or FKBP6 genes despite causing reductions at repetitive DNA sequences (LINE1, D4Z4).

**CONCLUSIONS:** Our results contrast with previous findings in tumor cells and shed new light on the ability to recover epigenetic states at clinically important loci in human.

**Poster 21**

**TITLE:** Could Propionibacterium acnes infection of the prostate gland be an important, modifiable risk-factor for prostate cancer?

**AUTHORS:** McDowell, A.,1 Barnard, E.,2 McCafferty, D.,3 Martin, L.,3 Fairly, D.,4 O’Rourke, D.,5 Catherwood, M.,6 and Patrick, S.2

**AFFILIATIONS: 1. Centre for Stratified Medicine, School of Biomedical Sciences, University of Ulster, Londonderry, UK 2. Centre for Infection & Immunity, School of Medicine, Dentistry & Biomedical Sciences, Queen’s University, Belfast, UK 3. School of Pharmacy, Queen’s University, Belfast, UK 4. Regional Virus Laboratory, Royal Victoria Hospital, Belfast Health and Social Care Trust, Belfast, UK 5. Histopathology & Cytopathology Laboratory, Belfast City Hospital, Belfast Health and Social Care Trust, Belfast, UK 6. Department of Hemato-Oncology, Belfast City Hospital, Belfast Health and Social Care Trust, Belfast, UK</p>

**BACKGROUND:** Prostate cancer is the most common male cancer in the UK, where it kills approximately 11,000 men every year. There is growing evidence from the literature that the opportunistic pathogen and anaerobic bacterium Propionibacterium acnes, which is an important component of the skin microbiome, may be an important cause of chronic, asymptomatic infection of the prostate gland ultimately leading to cancer (Cohen et al., 2005).
MATERIAL METHODS: To investigate this in more detail, we developed a highly specific quantitative real-time PCR (qPCR) assay for retrospective detection of *P. acnes* in formalin-fixed paraffin-embedded tissue sections prepared from archived prostate biopsy samples. A total of 81 biopsy samples, representing one or both prostate lobes, were examined from 53 patients with prostate carcinoma, versus 111 samples from 60 patients whose biopsies were histologically normal, disease-free.

RESULTS: We found that approximately 35% of the cancerous prostate tissue samples were positive for the presence of *P. acnes* compared to only 8% of the normal tissue (Fisher’s exact test, 2-sided; p<0.001). The levels of standardised genome copies in the cancerous tissue were also higher than in the control cohort (p<0.001). qPCR array studies with prostate epithelial cells chronically infected with *P. acnes* also revealed significant dysregulation of genes associated with cancer development and progression. The bacterium was also shown to survive intracellularly within epithelial cells which may prove pivotal for chronic infection.

CONCLUSIONS: In conclusion, our study reveals that *P. acnes* is significantly associated with cancerous prostate tissue and has the capacity to generate a host response, at least in vitro, that may stimulate oncogenesis over time. Such studies could lead to the early screening of men for this new potentially new risk-factor and treatments, such as antibiotic therapy or vaccination, to eradicate the organism before cancerous changes develop.


Poster 22

TITLE: Co-design of an electronic system to support memory assessment in primary care

AUTHORS: Aoife Farrell1<br />
Paulina Piasek1<br />
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BACKGROUND: European health care is influenced by three significant trends. Firstly the introduction of e-health, resulting in a changing crusade of hand written clinical notes to electronic notation and storage of patient details. Secondly, an aging population resulting in larger numbers of people presenting with age related concerns such as those about memory and dementia. Thirdly, public health policy is shifting emphasis to primary care as a response to chronic illness. This change in emphasis will need to be supported by adequate knowledge and infrastructure in primary care. This study reports on the co-design of an electronic system aimed to support health care professionals in memory assessment.

MATERIAL METHODS: The system was designed by carrying out an audit on clinical notes from Memory Works – a memory assessment service based in Dublin City University. The results were used to design electronic system using Human Centred Design principles. The system was developed in an iterative process between software engineers and clinicians where each phase was revisited to achieve the desired standard in the system.

RESULTS: The co-design process identified benefits of using an electronic system to memory assessment. These included avoidance of: illegible handwriting, lack of clarity around the finer details of the medical and social history. The system was designed to record detailed questions to gain more in depth information personal to the patients such as diet and sleep pattern. The system could assist decision making by flagging key aspects of the process via an automated, modifiable assessment summary.

CONCLUSIONS: The co-design enabled clinicians to foreground their data collection needs in the assessment process. It now needs full testing in a prospective clinical sample. We also need to investigate if the system will scaffold practitioners for whom memory assessment is not currently the main focus of their work.

Poster 23
BACKGROUND: Chronic myeloid leukaemia (CML) is associated with the BCR-ABL1 fusion gene located on the derivative chromosome 22 as a result of a t(9;22)(q34;q11.2) translocation. Tyrosine kinase inhibitors (TKIs) targeting the BCR-ABL1 oncoprotein are the standard therapy for patients with CML. Imatinib is approved for 1st line TKI treatment of newly diagnosed CML patients. However it is estimated that 20-40% will eventually require an alternative treatment because of intolerance or resistance to TKIs. The question is, can we personalise treatment for this intolerant or resistance TKI subgroup?

MATERIAL__METHODS: Conventional G-banded analysis and Fluorescence in situ hybridization (FISH) analysis were used to screen for t(9;22) translocations and pericentric chromosome 16 inversions during the course of the patient’s disease. An ultra-deep sequencing (UDS) strategy was used to screen for BCR-ABL mutants at diagnosis and blast crisis, transformation to secondary AML.

RESULTS: Chromosome and FISH analysis showed t(9;22) rearrangement at diagnosis (Imatinib started) but t(9;22) and inv(16)(p13q22) rearrangements at blast crisis, transformation to secondary AML (Standard AML induction chemotherapy and Nilotinib started). UDS detected E255K (90.50%) and Y253F (3.69%) mutations (verified by conventional Sanger sequencing) at blast crisis, transformation to secondary AML only. The t(9;22) and inv(16) rearrangements persisted after MUD stem cell transplant (Dasatinib). Two post transplant Donor Lymphocyte Infusions achieved a fourth remission. He continues on Dasatinib and is under close review.

CONCLUSIONS: E255K-mutates cell lines have demonstrated decreased sensitivity to imatinib compared with CML cell lines wild type for mutations (Gorre et al., 2001).

In pre-clinical studies, E225K-mutated cell lines demonstrated decreased sensitivity to Nilotinib and Bosutinib, but comparatively little reduced sensitivity to Dasatinib compared with cell lines wild type for mutations (Soverini et al., 2011).

Understanding the biology of a haematological disease such as CML will help to identify prevention, screening, and treatment strategies that may be more effective and cause fewer side effects than would be expected with standard treatments.


BACKGROUND: MicroRNAs are small, non-coding RNA species (19-25nts) which have been found to play a fundamental role in many molecular pathways including embryogenesis, cell differentiation, proliferation and apoptosis. Altered miRNA expression has been correlated with a wide range of disease states and pathologies, including cancer. Recently, there is an increasing body of evidence suggesting that epigenetic regulation of miRNAs via DNA methylation may be an important mechanism in contributing to their deregulation in cancer. We hypothesise that miRNAs with tumour suppressor function may be silenced by epigenetic modifications in prostate cancer (PCa).

MATERIAL METHODS: miRNA expression profiling and epigenetic analysis via CpG methylation assays covering different regions for each miRNA was done in PCa cell lines and clinical specimens.

RESULTS: In this study we carried out a screen for miRNAs showing altered expression in PCa cell lines. This identified three miRNAs (miR-205, miR-200c, miR-138) that are typically down-regulated in PCa cells and which may be controlled by methylation. We also show that the expression of these miRNAs is generally decreased in prostate tumour biopsy samples compared to matched normal tissue. We demonstrate that these miRNAs are up-regulated by the chemotherapy drug decitabine (5-aza-2'-deoxycytidine), which alters DNA methylation levels, and also by reduction in DNA methyltransferase 1 (DNMT1) levels in PCa cells. Methylation levels in the loci of each candidate miRNA were examined in PCa cells and biopsy tissue. We propose that the relative expression of these miRNAs is related to their respective methylation status. In addition, the functionality of the miRNAs in PCa cells has been investigated by examining their effect on cell proliferation, and by measuring expression levels of known and novel target genes.

CONCLUSIONS: Our findings provide further evidence that profiling miRNA expression and methylation status has great potential as a basis for a novel biomarker in the diagnosis and prognosis of PCa.

Poster 25

TITLE: Multidrug Vs Single Drug Interventions in the Cholesterol Biosynthesis Pathway: Predictions from Computational Modelling


BACKGROUND: Cholesterol has been heavily implicated in atherosclerosis and cardiovascular health. The cholesterol biosynthesis pathway is of great therapeutic and industrial importance as the target of statins, the principle pharmaceutical therapy for hypercholesterolemia. However, despite the critical role of this pathway, it is not understood at quantitative level. Furthermore, statin based therapies induce significant side-effects through their impact on off-target branches of the pathway. 

MATERIAL METHODS: ---

RESULTS: Here, we present several computational models of the cholesterol biosynthesis pathway. We describe its regulation through SBREP-SCAP mediated feedback inhibition and we model the response of the pathway to single-drug, statin-like intervention and to multi-drug interventions. Such multi-step interventions show higher specificity and greater robustness than single step interventions and require a lower net dosage to achieve the same degree of down-regulation.

CONCLUSIONS: We show that multidrug interventions can be created that tune the flux through the pathway in such a way that the therapy down-regulates the sterol arm of the pathway, without impacting upon the off-target, prenylation arm.

Poster 26

Title: Emerging technology platforms for near patient genetic analysis for personalised medicine.

Authors: Des Brennan, Paul Galvin.
Affiliations: Life Science Interface Group, Tyndall National Institute, University College Cork.

Background: Personalised genetic screening offers early disease diagnosis, prognosis, treatment and prevention tailored to the individual's genetic profile. Patient specific treatments based on pharmacogenetics promises to transform the global healthcare industry. Currently genetic testing is carried out at dedicated clinical laboratories with specialist personnel, a costly and time consuming process. However emerging technologies offer rapid, portable, low cost systems suitable for non-specialist medical facilities. These exploit nanotechnologies for sample preparation, implementing molecular biology protocols and enhancing mutation detection [1]. The challenges for such systems are to: (i) deliver a rapid “sample to result” < 60 minutes, (ii) screen from 20 to 200 mutations/test, (ii) reduce sample volume (<1μl) and (iv) deliver low cost test (<€10). In recent years commercial systems (Cepheid,BiofireDX,IQUUM) have delivered on-chip sample preparation and detection from biological samples diagnosing infectious and inherited diseases. We present an overview of challenges addressed by such systems and highlight work at the Tyndall National Institute integrating technologies to implement protocols for nucleic acid extraction, amplification and detection identifying specific DNA targets.

Materials & Methods: Planar magnetic microcoils manipulating micro/nanoparticles were combined with DNA extraction protocols while a PCR amplification protocol was implemented on an Electro-Wetting on Dielectric (EWOD) device. Arrayed Primer Extension (APEX) identified specific CFTR mutations of interest on a fluorescence microarray [2].

Results: The integrated system demonstrated viable DNA extraction, followed by target specific PCR amplification and mutation detection (APEX protocol) implemented on fluorescence microarray.

Conclusions: The technologies highlighted provided a basis to seamlessly implement genetic test protocols on an integrated platform.

References

Poster 27
TITLE: Examining the needs, requirements and acceptance of remote monitoring technology solutions for the long term informal care of older persons

AUTHORS: Dr. Dinsmore J, Galligan K, Clyne B, (1) Delaney S, (2) Prof Comiskey, C. (1)


BACKGROUND: Societal preference to be cared for at home by informal carers is a key issue facing an ageing society. Problems faced by informal carers include lack of experience in care, lack of specific tools to manage the process, stress and depression. The problem is highly topical as family carers provide 80% of long term care to dependent older people in Europe. The aim of this study was to explore the needs of informal caregivers (IC's) with a view to informing development of an AAL ICT solution to support IC’s (178)

MATERIAL & METHODS: A total of 28 IC's, 14 formal caregivers, 7 individuals receiving long term care and 4 community health professionals were recruited as part of a cross-sectional descriptive research study design. Semi-structured interviews and focus groups took place in Spain, Ireland, and United Kingdom. Data was analysed using thematic analysis. Ethical approval was obtained locally (55.)

RESULTS: Key IC’s needs include psychosocial and financial support, and help for practical and specialist care. The IC’s were particularly interested in the technical capability of the system to detect activities of the cared for person, including non-emergency situations. (38)

CONCLUSIONS: Information from this study is currently informing the development of the AAL ICT solution as part of a three year EU AAL CALL 5 grant award. (27.)


**Poster 28**

**TITLE:** "digitEase : Novel smart glove rehabilitative system"

**AUTHORS:** James Connolly 1, Joan Condell 1, Kevin Curran 1, Philip Gardiner 2, Brendan O-Flynn 3, Javier Torres Sanchez 3, Philip Angrove 3

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**BACKGROUND:** Rheumatoid Arthritis (RA) is a disease which attacks the synovial tissue lubricating skeletal joints. This systemic condition affects the musculoskeletal system, including bones, joints, muscles and tendons that contribute to loss of function and Range of Motion (ROM). Stiffness is a resistance of the mobility of a joint that may arise from physical damage around the joint or from a muscle spasm associated with pain [1]. Joint stiffness is subjectively measured and therefore difficult to quantify. The degree of pain increases in patient’s joints as inflammation increases, but other factors such as depression can amplify pain signals. Non-inflammatory conditions can also cause pain and confound the usefulness of pain as a gauge of disease activity. Objective measurement of joint stiffness is not recorded in clinical practice despite frequent use of early morning stiffness duration and intensity as an outcome measurement.

This abstract presents our digitEase smart glove system that will objectively measure joint stiffness. Latest miniaturisation techniques teamed with advances in sensor systems have facilitated the development of our bespoke data glove. Each sensor provides multiple degrees-of-freedom measurement information. Parallel processing techniques employed by the gloves controlling circuitry ensure maximum data recording and throughput.

**MATERIAL __METHODS:** This study builds upon our previous research in data glove development [1]. Current off-the-shelf gloves are restricted by a common problem with sensor calibration and donning and doffing [2], [3]. Our digitEase glove does not use a traditional underlying glove structure. Sensors are directly attached to the patient’s skin to obtain maximum accuracy throughout recording of patient movement. Each sensor can be easily fitted and removed without causing patient discomfort. Controlling circuitry transmits movement data wirelessly to a smart device or controlling computer. Movement information becomes immediately available to the clinician for analysis once targeted exercise routines are completed by the patient.

The digitEase software system manages objective routines defined by a clinician and performed by the patient in the clinic and at home. Each patient initially attends a clinic session for some basic system training. A reference objective routine recorded during this visit is used as a baseline comparison to future objectives completed at home. Objectives are typically completed first thing in the morning when the patient arises, at lunchtime and in the evening. The software system analyses angular and velocity data generated from patient movement to identify variance within each repetition. Dynamic pattern analysis demonstrates how joint motion varies within repetitions. Results will provide additional information to the clinician during initial patient diagnosis and progression measurement.

**RESULTS:** Clinical trials will commence within the Western Health and Social Care Trust in the coming weeks. A group of 12 patients with RA will test accuracy and usability of the glove in tandem with an off-the-shelf motion capture glove. This data glove has been analysed for accuracy using the Vicon motion capture system [4].

**CONCLUSIONS:** Joint stiffness is a debilitating disease that is difficult to measure due to its unpredictable onset. Our uniquely designed data glove with suitable controlling algorithms has the capability to capture joint movement at home. Measurements can provide subjective ROM information to assist the clinician in determining joint stiffness severity. Off-the-shelf data gloves are difficult to don and doff. Data glove calibration constraints limit the practicability of glove users to those with normal ROM. Sensors on our digitEase smart glove attach directly to the patients skin. This increases the scope of suitable users of the system and is particularly important for patients with limited ROM and joint stiffness.


HEALTH AND MIND HEALTH OF OLDER IRISH ADULTS

### Poster 29

**Title:** MTHFR 677TT genotype and related B-vitamins: novel determinants of hypertension in healthy Irish adults


**Affiliations:** A1 Northern Ireland Centre for Food and Health, University of Ulster, Coleraine; B2 UCD Institute of Food and Health, University College Dublin; C3 School of Food and Nutritional Sciences, University College Cork; D4 School of Clinical Medicine, Trinity College Dublin

**Presenting author:** Mary Ward, m.ward@ulster.ac.uk, +442870123076

**Background:** Homozygosity for the 677C→T polymorphism (TT genotype) in the gene coding for MTHFR, which requires riboflavin in its co-enzymatic form FAD as a cofactor, is associated with hypertension. We previously demonstrated that blood pressure (BP) is highly responsive to intervention with riboflavin when targeted specifically at individuals with the TT genotype; an effect shown in patients with existing cardiovascular disease or hypertension (Horigan et al, 2010; Wilson et al 2013). This investigation aimed to examine the role of this polymorphism and related B-vitamins as determinants of BP in healthy Irish adults.

**Material and Methods:** Data from the National Adult Nutrition Survey (NANS), a population-based sample of Irish adults (n = 1,019) were analysed. Biomarker concentrations of the relevant B-vitamins were measured in TCD and Ulster.

**Results:** Significantly higher diastolic BP was found in individuals with the TT genotype following adjustment for age and sex (p = 0.004). This phenotype appeared to be stronger in younger (below median age of 44y) and female individuals and similar effects were shown for systolic BP. Logistic regression indicated that age (p ≤0.001), male sex (p = 0.001), BMI (p ≤0.001) and the TT genotype (p = 0.030) were significant determinants of hypertension (defined as systolic BP ≥140mmHg or diastolic BP ≥90mmHg). Following adjustment for these factors, low versus high riboflavin status (using the median EGRac value) significantly increased the risk of hypertension (OR 1.43; 95% CI 1.01-2.01; p = 0.045), while the combination of the MTHFR 677 T allele and low riboflavin status doubled hypertension risk (OR 2.05; 95% CI 1.28-3.29; p = 0.003).

**Conclusions:** Within a representative sample of the Irish population, the MTHFR 677TT genotype was found to be a significant determinant of hypertension and this association appeared to be modulated by age, sex and riboflavin status.


**Poster 30**

**Title:** B-vitamins, genetics and mind health of older Irish adults

**Authors:** McGarel C1, McCann A1, Ward M1, Cunningham C2, Molloy AM3, Strain JJ1, Casey M2, Scott JM4, Pentieva K1 and McNulty H1

**Affiliations:** NICHE, Biomedical Sciences Research Institute, University of Ulster, Coleraine, BT52 1SA; 2The Mercers Institute for Research and Ageing, St James’s Hospital, Dublin; 3School of Medicine, Trinity College, Dublin 2 and 4(Deceased) School of Biochemistry and Immunology, Trinity College, Dublin 2.

**Background:** With the increasing ageing population in our society, cognitive dysfunction in older adults represents a major public health problem, with serious clinical implications. A body of evidence exists suggesting that suboptimal status of the metabolically related B-vitamins and/or elevated concentrations of the metabolite homocysteine, are linked with cognitive dysfunction in older adults(1), owing to their involvement in one-carbon metabolism. The aim of this study was to investigate the relationship between homocysteine, relevant B-vitamins, related genetic factors and cognitive health of older Irish adults.
MATERIAL__METHODS: An observational investigation of adults aged ≥ 60 years recruited from the island of Ireland, who were participants in the Trinity, Ulster Department of Agriculture (TUDA) Ageing Cohort Study. An extensive interview was conducted to provide self-reported information on lifestyle, medical/family history, anthropometric measures and demographic details. A battery of neuropsychological assessments including RBANS, MMSE, and FAB were used to assess cognitive function. Validated questionnaires that screen for depression and anxiety were also administered. Biomarker status of homocysteine and the related B-vitamins were determined from non-fasting blood samples.

RESULTS: Age, education and depression levels were found to be significant determinants of cognitive performance amongst older adults. When the analysis was adjusted for these variables, higher homocysteine, low vitamin B2 and low vitamin B6 were each found to be significant predictors of cognitive dysfunction.

CONCLUSIONS: Although often not considered, it is biologically plausible that vitamin B2 and B6 may play important roles in cognitive health, due to their metabolic inter-relationship and the involvement of both in one-carbon metabolism. Further research is required, ideally in the form of randomised controlled trials, with robust outcome measures such as brain imaging techniques, in order to determine whether a causative relationship exists.

BACKGROUND: Hypertension is estimated to account for 14% of global mortality. Emerging evidence (GWAS and epidemiological) shows a significant association of the C677T polymorphism in the methylenetetrahydrofolate reductase (MTHFR) gene with hypertension. Most recently, studies show that blood pressure can be effectively lowered specifically in individuals with the homozygous mutant (TT) genotype by treatment with riboflavin, 4,5,6, which acts (in the form FAD) as a cofactor for MTHFR. The aim of this study was to investigate the attitude of General Practitioners (GPs), who are primarily responsible for the management of hypertension, to this novel gene-nutrient interaction and the potential role of riboflavin in the targeted treatment of BP in this genotype group.

MATERIAL&METHODS: From an online register of GP practices in Northern Ireland, an estimated 600 GPs were invited to complete a short (i.e. one-page) questionnaire. A brief summary of the evidence to support this novel role of riboflavin was provided and links to the relevant scientific publications were made available.

RESULTS: Of those approached, a response rate of 19% (n=114) was achieved. The majority of respondents (77%) stated that they would (or possibly would) recommend riboflavin supplementation to all hypertensive patients irrespective of genotype. However, when later asked if they would recommend riboflavin specifically to hypertensive patients identified with the C677T polymorphism (targeted approach), significantly more respondents (97%), answered yes (p<0.001). When asked if they would be willing to allow their patients to be genetically screened for the MTHFR genotype, 98% were in favour and almost all GPs sampled (99%) agreed there was a role for this novel treatment in BP management.

CONCLUSIONS: The results indicate a generally positive attitude of GPs to this novel treatment option for hypertension, and a strong preference for riboflavin as a targeted treatment strategy, in patients with the MTHFR 677TT genotype. The findings may have important implications for the translation of this novel gene-nutrient interaction to the treatment of hypertension, in the estimated 10% of individuals worldwide (and up to 30% in some populations) with the relevant genotype.

subsequently examined the effects of high glucose on TRPV4 mRNA expression in BRECs. TRPV4 transcripts as well as protein levels were appreciably lower in cells treated with high glucose. Following pre-incubation of BRECs with CPA, the Ca2+ influx component of the 4α-PDD response was attenuated in cells grown under high glucose conditions (0.02±0.005 R340/380, n=8). Experiments were also performed to examine TRPV4-mediated membrane currents using the whole-cell patch clamp technique. The TRPV4 specific agonist GSK1016790A (1µM) increased membrane current amplitude at -80mV (-5.14±3.17 to -12.55±5.09 pA/pF, n=6) and this was reversed by the TRPV4 antagonist HC-067047 (1µM) (-5.53±2.80 pA/pF, n=6). The effects of GSK1016790A were abolished after culturing cells in high glucose (-0.78±0.34 pA/pF before and -1.14±0.39 pA/pF after GSK1016790A; -0.99±0.34 pA/pF after HC-067047, n=8). Osmotic control experiments were undertaken using mannitol or L-glucose (20mM + 5mM D-glucose). The gene and protein expression and functional responses of TRPV4 channels were identical to those observed under normal glucose conditions.

CONCLUSIONS: The expression and function of TRPV4 channels is downregulated in retinal endothelial cells under hyperglycaemic conditions. Changes in TRPV4 expression may contribute to endothelial cell dysfunction during diabetes, an issue that warrants further investigation.

REFERENCES: We thank BBSRC, EFSD and DEL for financial support.

Poster 34

TITLE: Patterns of Stressful Life Events: Distinguishing Suicide Ideators from Suicide Attempters

AUTHORS: Danielle McFeeters, David Boyda, Siobhan O’Neil

AFFILIATIONS: Danielle McFeeters, David Boyda, Siobhan O’Neil, A1

A1 University of Ulster

BACKGROUND: Suicidal ideation is an important indicator for subsequent attempt yet only a proportion of ideators transit from thought to behaviour. As suicide rates continue to rise, interest in the factors that distinguish ideators who attempt from non-attempters has grown. The study aimed to identify distinct classes of life events amongst a sample of ideators and assess the ability of the classes to predict the risk of suicide attempt

MATERIAL _ METHODS: A subsample of ideators was extracted based on responses to the suicidality section of Adult Psychiatric Morbidity Survey (N=7403). Fifteen items pertaining to stressful life events (SLE) were utilised for analysis

RESULTS: Latent Class Analysis (LCA), three distinct classes of life events emerged; a low SLE class, a high interpersonal conflict class and a high multiple SLE class. Class 3 which comprised of high levels of multiple stressors was significantly more likely to attempt suicide than the other classes.

CONCLUSIONS: The findings in the current study suggest that certain patterns of events specifically the experience of high interpersonal conflict coupled with high financial crisis and interpersonal abuse may predict the risk of transitioning towards suicide behaviour. In application, this re-emphasises the need for routine appraisal of risk amongst this vulnerable group and assessment of the multiple events which may indicate which individuals may be at immediate risk.


Poster 35

TITLE: Sex differences in the Disc1 transgenic mouse model of major mental illness

AUTHORS: Murray, E.K. (1), Lang B (2), McCaig , CD (2) & St. Clair, D (2)

AFFILIATIONS: (1) Northern Ireland Centre for Stratified Medicine, University of Ulster, C-TRIC, Altnagelvin Hospital, L’Derry BT43 6SB
BACKGROUND: The sex of an individual is a critical determinant of mental health and mental illness. Sex differences have been reported in the incidence, age-at-onset, symptoms and prognosis of most psychiatric disorders but very little is known about the biological basis of these sex differences. Genetic susceptibility is also an important risk factor for mental illness. DISC1, a protein encoded by the Disc1 gene, was first identified in a Scottish family with a high incidence of mental illness and plays a crucial role in brain development (1-2).

MATERIAL METHODS: A genetic mouse model for medical mental illness containing a truncated form of DISC1, similar to that found in patients, has been established and presents behavioural and neurological deficits consistent with those found in schizophrenia, bipolar disorder and depression (3).

RESULTS: Our results show that neuroanatomical, neurochemical and behavioural phenotypes in the Disc1 model, including critical aspects of early brain development, are sex-specific. Male Disc1tr mice weigh significantly less and total brain surface was lower than their wild-type counterparts. No effect on either measure was identified in females. Similarly, Disc1tr male mice have fewer parvalbumin-positive GABAergic interneurons in the medial prefrontal cortex but the Disc1 mutation had no effect on paralbumin-positive cells in females.

CONCLUSIONS: These results demonstrate that there may be overlap between sexual differentiation of the brain and Disc1-related brain development, which may contribute sex-specific phenotypes observed in major mental illness.


Poster 36

TITLE: Health Literacy in the Community

AUTHORS: Leeann Monk & Jennifer Neff

AFFILIATIONS: In Your Element Ltd, 1 Glen Road, Derry, BT48 0BX inyourelement@outlook.com www.inyourelement.me

BACKGROUND: Health literacy can be defined as the ability to obtain, read, understand and use healthcare information to make appropriate health decisions and follow instructions for treatment or to make positive lifestyle choices. Low health literacy levels are more prevalent in socially deprived areas. Lower health literacy is associated with less knowledge of chronic disease processes, poorer mental and physical health, limited use of preventive services, and higher rates of hospital admissions and it also has a positive correlation with social deprivation.

There is a lack of studies in UK relating to health literacy however it is widely recognised that this is a growing problem for the health service. Derry City Council area was well placed as the test bed for this research given the links between social deprivation and lower health literacy levels (Derry being the 3rd most socially deprived Local Government District in the NI, NINIS 2013).

In Your Element designed the Health Literacy in the Community Project in partnership with the Innovation Ulster team at the Magee Campus of University of Ulster. The project aimed to determine the most effective media in engaging and educating people with low health literacy levels about the risks and impacts associated with obesity and diabetes. Stage 1 of the project was to design (in line with user requirements) three different health literacy friendly mediums. The three different forms of media chosen were:

1. Digital info graphics
2. 3D Animation video
3. Printed material
Stage 2 of the project (in working progress) will determine the most effective of these three types of media in engaging and educating people about the risks and impacts associated with obesity.

MATERIALS & METHODS: An overview of the process of stage 1 can be seen below:

1. Recruitment of participants (From Health and Wellbeing Programme within the Healthy Living Centre all with BMIs over 30)
2. Engagement of participants in the branding and style of the medias via mood boards (Discover and Develop Sessions)
3. Produce key findings report

RESULTS: The 'Discover and Develop' workshops, were led by Community Leaders in Health and Wellbeing, Leean Monk and Jennifer Neff and facilitated by The Old Library Trust Healthy Living Centre. A total of 45 people from a Neighbourhood Renewal Area in the DCC area where involved, in which they viewed a series of mood boards to determine likes and dislikes relating to design, style of branding and impact of messaging around health improvement messages. Participants were then asked to place coloured stickers on the most appealing aspects of design of 8 mood boards. Each mood board consisted of colour pallets, animation design, info graphics and poster campaigns relating to health and wellbeing messages. The mood boards were designed by Terry Quigley, Mark Cullen and Padraic Lynch (Innovation Ulster Team).

The age range of those taking part varied from 18 -84 years old. A total of 67% of the participants where female and 33% were male. From this a pallet of colours was selected as the most popular and this then formed the basis of the design of the 3 communication methods. The core campaign was determined by the individuals in the study as they chose the characters for the animation, the style of the poster campaign and the look and feel of the info graphic. A pallet of colours was selected as the most popular and this formed the basis of the branding design of the 3 communication methods.

CONCLUSIONS: This project was designed by partners represented by the third sector, industry, academics, clinicians and members of the community. A community development approach was adapted for the design of all three health and wellbeing improvement mediums from the outset. This approach has been both unique and critically important given the complexity of the behaviours and barriers to health improvement of the end user. What sets this work apart from others locally and nationally is the consistent engagement with the target audience, the over riding focus on those with lower health literacy levels and the need for constant feedback on design, style and user experience throughout the project.

The key outcome of the project was that, involving the user from the outset increases any chance of success in getting the health messages across as the three different forms of communication were pre determined by the target audience. Stage 2 of this study will be published at a later date which will determine the most effective of these three types of media in engaging and educating people (with low health literacy levels) about the risks and impacts associated with obesity and diabetes.

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6TH ANNUAL TRANSLATIONAL MEDICINE CONFERENCE  
City Hotel, Derry/Londonderry (25th & 26th September 2014)  

“Personalising Health and Care”  

ABSTRACTS (ORAL PRESENTATIONS)  

<table>
<thead>
<tr>
<th>Time</th>
<th>Personalised/Stratified Medicine</th>
<th>Technology &amp; Novel Approaches for Improved Disease Prevention, Management &amp; Patient Care</th>
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| 5.00pm | **Ms Melody Chemalaly**  
Dominant and Recessive Forms of Familial Hypercholesterolemia in Lebanese Families: The need for a more personalised approach. | **Dr Karen McGuigan**  
Personalising diabetes education. |
| 5.15pm | **Dr Victoria McGilligan**  
The NLRP3 inflammasome: A potential target for inflammatory disease. | **Mr Vahab Youssofzadeh**  
Towards stratifying rehabilitation of stroke patients through measuring casual brain connectivity. |
| 5.30pm | **Dr James Beirne**  
A new primary preventative strategy for high grade serous ovarian cancer. | **Ms Jolene Phair**  
Developing smart bandage materials for the management of chronic wounds. |
| 5.45pm | **Ms Seodhna Lynch**  
Epigenetic regulation of miRNA expression in prostate cancer | **Mrs Julie-Ann Augusto**  
Patient Self-Testing of INR using U-Tell software, patient empowerment within a service technology framework. |
| 6.00pm | **Dr Mary Ward**  
MTHFR 677TT genotype and related B-vitamins: novel determinants of hypertension in healthy Irish adults. | **Ms Aoife Farrell**  
Co-design of an electronic system to support memory assessment in primary care. |
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<th>Presenting Author</th>
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<td>RNAseq identifies therapeutic candidates for the treatment of oral dysplasia</td>
<td>Caroline Conway</td>
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<td>Dominant and Recessive Forms of Familial Hypercholesterolemia in Lebanese Families: The need for a more personalised approach</td>
<td>Melody Chemlaly</td>
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<td>Personalising diabetes education</td>
<td>Karen McGuigan</td>
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<td>Plasma modified electrospun biomaterial membranes – a personalised approach to heart valve regeneration</td>
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<td>Computational models of ganglion cells for visual prostheses</td>
<td>Dermot Kerr</td>
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<td>Investigation into auditory processing of pitch and volume using Magnetoencephalography (MEG)</td>
<td>Richard Gault</td>
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<td>Role of the endocrine pancreas in the development of Cystic Fibrosis related Diabetes</td>
<td>Fiona Manderson Koivula</td>
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<td>Fluorescence in situ hybridisation reveals cellular pattern of a genomic amplification discovered by next generation sequencing</td>
<td>Phil Egan</td>
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<td>CD22 Activation in Rheumatoid Arthritis Patients receiving first Biologic treatment</td>
<td>David Gibson</td>
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<td>The associations between conflict, trauma &amp; suicidal behaviour in Northern Ireland</td>
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<td>Leanne Breslin</td>
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<td>Pre-clinical development of surface modified Titanium foams and bioactive glasses for orthopaedic applications</td>
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<td>A Personalised Healthcare Approach towards Behaviour Change in Pre-Diabetics</td>
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<td>An evaluation of the clinical and economic impact of procedural packs in secondary care</td>
<td>Liam Callaghan</td>
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<td>Incomplete reprogramming in differentiated human cells following</td>
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<td>important, modifiable risk-factor for prostate cancer?</td>
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<td>Personalised medicine – fine tuning a patient’s treatment strategy</td>
<td>Peter McGrattan</td>
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<td>to improve outcome in an imatinib resistant CML patient using</td>
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<td>Health Literacy in the Community</td>
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