



**MDVSN**

Medical Devices and Vulnerable Skin Network

**MDVSN<sup>PLUS</sup>**

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# Third Sandpit Meeting

Thursday 20 October 2016

Programme and Agenda

Registration from 10am in The Coach House  
with coffee and pastries

With Co-Investigators



The University of  
**Nottingham**



**MORNING SESSION: THE COACH HOUSE, CHILWORTH MANOR**  
**Chaired by Professor Dan Bader**

- 10.30am**      **Professor Dan Bader, Professor of Bioengineering and Tissue Health, University of Southampton (30 mins)** - Summary of MDVSN 2015-2016 activities, introduction to MDVSN<sup>PLUS</sup> and announcement of funding calls on feasibility study projects.
- 11.00am**      **Professor Stephen Morgan, Professor of Biomedical Engineering, University of Nottingham (20 mins)** – Sensing elements embedded within medical devices to detect early signs of damage
- 11.20am**      **Professor Ralph Sinkus, Chair in Bioengineering, King's College London (20 mins)** - Exploring tissue biomechanics via waves: application to cancer, neurodegenerative diseases, and mechanotransduction
- 11.40am**      **Dr Stephen Oakeshott, Programme Manager, Translational Research, Medical Research Council (20 mins)** - MRC funding opportunities for medical device development
- 12.00pm**      **Mike Clancy, Director, Medstrom Healthcare (20 mins)** – Working with MDVSN to drive product innovation

**12.20 – 13.30      LUNCH AND NETWORKING – THE COACH HOUSE**

**AFTERNOON SESSION: THE COACH HOUSE, CHILWORTH MANOR**  
**Chaired by Professor Dan Bader**

- 13.30pm**      **Dr Elena Mancuso, Research Fellow, IMPRESS Network (15 mins)** - Breaking barriers in skin sensing assessment
- 13.45pm**      **Professor Patricia Grocott, Professor of Nursing Technology and Innovation, King's College London (15 mins)** - Technologies and systems for people vulnerable to skin breakdown
- 14.00pm**      **Interns from Eindhoven University of Technology:**
- **Dries van Roover, Research Assistant (5 mins)** – Lymphatic video analysis
  - **Man Teng Fung, Research Assistant (5 mins)** – A mathematical model to predict microclimate at loaded support surface
- 14.15pm**      **Hannah Liversedge, PhD Candidate, University of Southampton (15 mins)** - Skin breakdown in premature neonates

**14:30 MDVSN WORKSHOP ACTIVITY (50 mins)**  
**Chaired by Dr Peter Worsley**

- 15:20pm**      **Dr Peter Worsley, Lecturer, University of Southampton (10 mins)** - Summary and closing remarks

**15.30 REFRESHMENTS AND NETWORKING – THE COACH HOUSE**

## SPEAKER BIOGRAPHIES

### **Professor Dan Bader, Professor of Bioengineering and Tissue Health, University of Southampton**

Professor Dan Bader is a physicist by training (BSc, MSc) with a PhD in Bioengineering at the University of Southampton. His postdoc position at Oxford University focused on engineering aspects of pressure ulcer (PU) prevention. He later moved to Queen Mary, University of London (QMUL) as a lecturer in Biomaterials leading Soft Tissue Research in the EPSRC Funded IRC in Biomedical Materials (1991-2002).

In 1999, he became first Professor of Medical Engineering, establishing a world-renowned research group at QMUL. In 2011, he joined the Faculty of Health Sciences (FoHS) at University of Southampton as Professor of Bioengineering and Tissue Health, to establish a multidisciplinary team focusing on Skin Health. Since 2000, he has been a Part-Time Professor in Soft Tissue Remodelling in Biomedical Engineering at Eindhoven University collaborating with Oomens on skin damage and PU research. In 2006, he was elected to the World Council of Biomechanics.

In 2011, he became Editor of the Journal of Tissue Viability and was presented the Senior Investigators Award by the European Pressure Ulcer Advisory Panel (EPUAP), an organisation he serves as a Trustee. His research areas include (i) Bioengineering solutions in PU prevention; (ii) Imaging of soft tissues; (iii) Designing medical devices and systems for clinical use; (iv) Cell/ tissue biomechanics. Bader has published over 185 scientific papers, has a current H factor of 45, and edited three books.

### **Professor Stephen Morgan, Professor of Biomedical Engineering, University of Nottingham**

Professor Stephen Morgan, University of Nottingham (UoN), has since 1992, investigated novel optical techniques for imaging and spectroscopy of tissue using laser Doppler flowmetry, acousto-optic imaging and hyperspectral imaging. At UoN, he has held an EPSRC Advanced Fellowship (1998-2006), Readership (2006-2010) and became Prof. of Biomedical Engineering in 2010. His research involves the development of devices to monitor the microcirculation specifically in tissue breakdown and wound healing. For example, he currently has i4i funding for development of a novel endotracheal tube that can monitor the microcirculation at the cuff/trachea interface.

Recent work involves the development of photonic textiles. These sensing systems, incorporated into garments can monitor pressure, temperature and the microcirculation. He has 2 licence agreements with Moor Instruments Ltd (blood flow imaging) and Footfalls and Heartbeats Ltd (Photonic Sensing Socks) and is involved with a joint research venture Heartlight Systems Ltd ([www.heartlightsystems.com](http://www.heartlightsystems.com)) to develop an optical heart rate monitor for newborn infants in the delivery room.

### **Professor Ralph Sinkus, Chair in Bioengineering, King's College London**

Professor Sinkus is a Physicist by background and has built his career both in industry and in academia. From 1997, Professor Sinkus worked at Philips Medical Systems Research Laboratories in Hamburg, Germany, where the main focus of his research was in the domain of MRI, specifically in the field of MR-elastography (MRE). Following this position Professor Sinkus entered academia to become Research Director at CNRS in Paris, France.

He is now Professor and Chair in Biomedical Engineering at the Division of Imaging Sciences & Biomedical Engineering at King's College London, where he leads a research group on tissue mechanics and MRE. Professor Sinkus is one of the leading researchers in MRE with expertise in tissue mechanics across multiple disease areas. He is at the forefront of MRE research and has developed novel technologies and techniques with commercial opportunities

### **Dr Stephen Oakeshott, Programme Manager, Translational Research, Medical Research Council**

Steve is one of a team of Programme Managers with responsibility for Translational Research and Industry at the Medical Research Council (MRC). As part of the Biomedical Catalyst: Developmental Pathway Funding Scheme, the MRC's primary route for support of translational research, he is the lead point of contact for applications seeking to develop diagnostics or medical devices

After undergraduate and postgraduate studies at the University of Cambridge, Steve moved to New York, initially as a post-doctoral researcher at Brooklyn College, CUNY and subsequently as a Principal Scientist at PsychoGenics, a preclinical contract research company. He returned to the UK in 2012 to take up research management at the MRC, where he has been part of the translational team since late 2013.

### **Mike Clancy, Director, Medstrom Healthcare**

Michael began his career in Marketing and NPD with 'Boots' in Nottingham where he participated in the development of a new IV therapy system, 'Steriflex'. In 1982 Michael established the UK subsidiary of SSI which originated the concept of 'Clinitron Therapy' renting therapeutic beds and mattresses. In 1985 SSI was acquired by US manufacturer Hill-Rom where Michael remained as the company's VP Northern Europe participating in the development of a new service concept, 'Total bed Management'.

In 2005, Michael left and participated in an MBO of pressure area care company, Frontier Medical, where he continued as the company's UK Managing Director. In 2011, Michael participated in an MBO of Hill-Rom's UK bed management contracts and co-founded Medstrom with former Hill-Rom senior management colleagues and created the UK's only independent bed management company, now managing more than 20% of the NHS bed and mattress fleet and launching an innovative alternative to traditional foam mattresses.

In 2016 Michael was appointed non-executive Director of Inotec, innovators of Natrox humidified oxygen therapy to assist with chronic wound healing. Until recently, Michael was also on the board of directors for the British Healthcare Trade Association.

### **Dr Elena Mancuso, Research Fellow, IMPRESS Network**

Dr Elena Mancuso is a biomedical engineer. She is currently working as Medical Technologies Research Fellow on the IMPRESS project (<http://www.impress-network.com/page/impress>), focusing on the design and development of advance implantable devices for the management of human incontinence. With experience in different engineering research areas, her main interests remain in the field of bioengineering, particularly biomaterials and tissue engineering.

Her background includes a PhD in Mechanical Engineering (Newcastle University - UK, 2016), which focused on the physico-chemical and mechanical characterisation of novel bio ceramic materials, and the fabrication and characterisation of 3D substitutes for bone tissue repair, using powder-based 3D printing technology. She holds a BSc (Universita' Politecnica delle Marche - Italy, 2007) and a MSc (Politecnico di Torino - Italy, 2010) both in Biomedical Engineering. Furthermore, she has two years working experience in the Research & Development department of DiProMed SRL (Torino, Italy), a biomedical company specialised particularly in manufacturing of surgical mesh in polypropylene for the treatment of hernia, abdominal wall defects and urinary incontinence. After the completion of her PhD, she worked as Research Assistant in the School of Mechanical Engineering (Newcastle University - UK) on a project funded by the ARUK Tissue Engineering Centre, in collaboration with the University of Cambridge and two industrial partners.

### **Professor Patricia Grocott, Professor of Nursing Technology and Innovation, King's College London**

Patricia trained as a Registered General Nurse at St George's Hospital London, and then worked in various NHS posts before joining the palliative care team at the Princess Alice Hospice in Surrey in 1985. She undertook an extramural Diploma in Nursing Studies from Birkbeck College and subsequently her undergraduate and PhD at King's College London (KCL).

In 2000, Grocott was appointed as PDRA and was promoted to Research Fellow in 2001, Senior Research Fellow in 2004. She is currently a Reader in Palliative Wound Care. Grocott is the KCL Co-Applicant of the NIHR HTC in WP&T.

Professor Patricia Grocott and the KCL team (Professor Glen Roberts, Dr Tanya Graham) is focused on patient involvement in medical device and systems development in relation to wound care. Their rigorous formative research is focused on user experiences of the technologies and devices, in order to prevent future skin damage and to promote palliation, symptom control and wound healing. This includes facilitating the co-design of wound care technologies, devices and systems with the users, adopting technologies, devices and systems into clinical care pathways, and evaluating new methods and measurement tools. The clinical data system and the collaborative working have been replicated in further projects to find solutions to other clinical problems.

### **Dries van Roover**

Dries is a Dutch Masters student from University of Technology in Eindhoven. He studies Biomedical Engineering and specializes in Biomechanics of Soft Tissues under Cees Oomens. As part of this research group he focusses on developing objective methods to identify patients at risk of developing a pressure ulcer and to develop techniques for early detection of deep tissue injury.

### **Man Teng Fung**

Man Teng is a Dutch Masters student from University of Technology in Eindhoven. She studies Biomedical Engineering and specializes in cell-matrix interactions under Cees Oomens and Carlijn Bouten. As part of this research group she focusses on developing objective methods to understand the wound closure process of chronic wounds.

### **Hannah Liversedge, PhD Candidate, University of Southampton**

Hannah Liversedge completed a Bachelor of Nursing at the University of Southampton. Since qualifying in 2012, she has worked clinically as a staff nurse in the Paediatric Department of the Queen Alexandra Hospital, Portsmouth, while completing her PhD. She has also been involved in delivering staff education for the Wessex and Thames Valley Neonatal Network. The focus of her research is skin integrity in hospitalised neonates, especially in relation to medical device-related damage.

### **Dr Peter Worsley, Lecturer, University of Southampton**

Dr Peter Worsley qualified as a physiotherapist (BSc, 2007) and completed a PhD in Bioengineering (2011) both at University of Southampton. In his early research he acquired skills and experience in *in-vivo* monitoring (healthy volunteers and patient cohorts) and *in-silico* research techniques, funded by industry (DePuy).

In 2012, he joined the Skin Health Research group, where he develops test methods and protocols for *in vivo* testing in the state-of-the-art lab facilities and supervises research students (PhD, MSc and overseas internships). He is now combining his research experience in the clinical and bioengineering setting to initiate and implement research which has clear translation to the clinical practice. His research has attracted collaborations with academics from University of Southampton, the UK, and key international leaders. His skills include physiological and biomechanical monitoring, imaging of musculoskeletal tissues and computational techniques to predict device-body interactions.

Peter's research interests vary across the spectrum of skin health to include patient sub-populations from neonates to lower limb amputees. His research has been funded by UKRCs, NIHR, local University of Southampton ECR equipment grants, NHS Trusts (PhD studentships) and industry totalling £429,000 in grant income.