University of Southampton

MDVSN

Medical Devices and Vulnerable Skin Network

MDVSN PLUS

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Annual Network Meeting

Thursday 25th May 2017

Programme

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

With Co-Investigators

King's College London

The University of Nottingham

EPSRC Engineering and Physical Sciences Research Council

D4D Devices for Dignity

WOUNDTEC HTC Wound Prevention and Treatment Healthcare Technology Co-operative

NHS National Institute for Health Research

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

10.30am **Welcome and Summary of MDVSN Research Activities and Achievements**
- Professor Dan Bader, MDVSN/ MDVSN^{PLUS} PI

11.00am **The Cyclops network - automated treatment?**
- Professor Stephen Morgan, Professor of Biomedical Engineering, University of Nottingham

Successful Funding Applications to MDVSN Call 2014-2017

11.20am **Design and In vitro testing of soft Biodegradable Electrochemical Sensors for biosensing at Wound Sites**
- Professor Pankaj Vadgama, Professor and Director of IRC in Biomedical Materials, Queen Mary University of London

11.40am **Breaking Barriers in Skin Sensing Assessment**
- Dr Mike Bryant, IMPRESS Network, University of Leeds

MDVSN^{PLUS} Funding Call 2017 Introduction

12.00pm **MDVSN^{PLUS} Funding Call –** Review of current activities. Examples of successful applications from the first call.
- Dr Peter Worsley, MDVSN^{PLUS} Co-I

12.30 – 13.30 LUNCH AND NETWORKING – THE COACH HOUSE

AFTERNOON SESSION: THE COACH HOUSE, CHILWORTH MANOR
Chaired by Dr Peter Worsley

MDVSN^{PLUS} Funding Call 2017 Project Discussions

13.30pm **MDVSN^{PLUS} Funding Call Themes –** Dr Peter Worsley, MDVSN^{PLUS} Co-I.
Our next call will be focused on intelligent sensing to promote self-management in core themes. Applications to clinical settings can typically include:

- Diabetic Foot Ulcer
- Sensing and Remote Monitoring in the Community
- Improved Devices in Critical Care

14.00pm **Delegate Feedback: Response to Funding Call Themes -** Dr Peter Worsley, MDVSN^{PLUS} Co-I.

14.15pm **Parallel Theme Sessions: Group Discussions and Proposal ideas –** Group Activity

15.15pm **Feedback on Potential Project Proposals**

15.30pm **Summary and Next Steps -** Dr Peter Worsley, MDVSN^{PLUS} Co-I

17.00 DINNER – 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 200 scientific papers, has a current H factor of 45, and edited three books.

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

Stephen Morgan is Professor of Biomedical Engineering at the University of Nottingham. Since 1992 he has investigated novel optical techniques for imaging and spectroscopy of tissue using techniques such as laser Doppler flowmetry, acousto-optic imaging and hyperspectral imaging. His research involves the development of optical devices to monitor the microcirculation for applications such as wound healing.

At the University of Nottingham, 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) to develop an optical heart rate monitor for newborn infants in the delivery room.

Dr Michael Bryant, lecturer, University of Leeds

Dr Bryant is currently developing research and teaching activities devoted to modern aspects of corrosion, tribology and surface science. This includes surface chemical effects in energy production, bio-tribology, bio-corrosion and methods of mitigation. His research is concerned with understanding and optimising the interactions occurring at interfaces commonly found in many applications. His research addresses a wide range of applications including aerospace, automotive, orthopaedic, cardiovascular and incontinence technologies.

Dr Bryant completed a PhD in Mechanical Engineering - Tribocorrosion of Bio-medical Alloys and a BEng (hons) in Mechanical Engineering both at University of Leeds.

Prof Pankaj Vadgama, Professor and Director of IRC in Biomedical Materials, Queen Mary University of London

Professor Vadgama is Director of the IRC in Biomedical Materials, Professor of Clinical Biochemistry, and until recently, Head of Service in the Department of Clinical Biochemistry, Barts Health NHS Trust. Prior to this he was Professor of Clinical Biochemistry, University of Manchester and Professor of Medical Biomaterials, Manchester Materials Science Centre.

Professor Vadgama's research interests include the development of biocompatible biosensors for reliable metabolite monitoring in critically ill patients. Specific systems include sensors for glucose and lactate. He is also investigating the interaction of cells and proteins at materials surface and is presently studying the use of spider silk as a tissue engineering scaffold. Underpinning techniques and technologies include: polymeric membranes, electrochemistry, impedance spectroscopy, in vivo metabolite sensors, bioprocess monitoring contact angle measurement and piezoelectric sensing.

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.