Welcome
Senior Portfolio Manager, Jeanine Woolley

• Welcome
• Panel members: Prof John Girkin who will be chairing the Q & A sessions, Philippa Hemmings, Jeanine Woolley, Kate Reading and Prof Steve Morgan
• Webinar protocols are all participants have been muted
• Questions to be posted via the Q&A function
  • Q&A sessions will be chaired by Prof John Girkin
    • When asking a question, to please state which sector you from i.e. academic, clinician, industry
• Webinar will be recorded and be uploaded to the call website
• Developing a FAQ document which will be uploaded to the call website
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>10am</td>
<td>Welcome, agenda and webinar protocol, Senior Portfolio Manager</td>
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<tr>
<td>10:05</td>
<td>Call scope and aims - EPSRC Head of Healthcare Technologies</td>
</tr>
<tr>
<td>10:15</td>
<td>First Q &amp; A session</td>
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<tr>
<td>11:00</td>
<td>Break 10 minutes</td>
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<tr>
<td>11:10</td>
<td>What I wish I had known or thought of before applying</td>
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<tr>
<td></td>
<td>° 10 min presentation from Network co-ordinator; challenges, and lessons learned, Prof Steve Morgan, University of Nottingham</td>
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<tr>
<td>11:20</td>
<td>What I wish I had known or thought of before applying</td>
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<td></td>
<td>° 10 min presentation from Network Plus Director; challenges and Lessons learned, Professor Gail ter Haar, the Institute of Cancer Research</td>
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<tr>
<td>11:30</td>
<td>Second Q &amp; A session - questions for the two presenters</td>
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<tr>
<td>11:55</td>
<td>Close of webinar</td>
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</tbody>
</table>
Call scope and aims - Philippa Hemmings, EPSRC Head of Healthcare Technologies
Questions to panel about the call
Break – 10 minutes
What I wish I had known or thought of before applying

Prof Steve Morgan, University of Nottingham

- Closed loop control systems for optimisation of treatment
  
  http://www.cyclops-network.ac.uk/

- Challenges and lessons learned
What I wish I had known or thought of before applying

Stephen Morgan
Royal Society Industry Fellow
University of Nottingham

www.healthcaretechnologies.ac.uk
Twitter @CentHealthTech
Academic Director of the Centre for Healthcare Technologies
www.healthcaretechnologies.ac.uk

Prof Biomedical Engineering - Biomedical optics and medical device research (measurement devices)

Royal Society Industry Fellow (2018-22)

EPSRC Networkplus
• Closed loop control for optimisation of treatment (PI, 2016-19)
• Medical Devices and Vulnerable Skin Networkplus (CI, 2016-19)
• Fast Healthcare Networkplus (Advisory Board)

Motivation
• Can we make measurement systems respond automatically for better treatment?
• Can we apply better measurement devices to avoid tissue damage?
• EPSRC Networkplus Case Studies
  • Closed loop control for optimisation of treatment
  • Medical Devices and Vulnerable Skin Network

• It’s a good idea ..

• It’s a bad idea ..

• Coordinating the network
With development of new sensors and artificial intelligence, can we optimise treatment based on multiple measurements and tailored treatment that is continuously optimised?
Closed loop control for optimisation of treatment
Clinical areas
i) critical care;
ii) chronic wound care;
iii) cancer treatment.

www.cyclops-network.ac.uk
Objectives

• Create an effective, multidisciplinary and multi-stakeholder network to develop closed loop control (CLC) for optimisation of treatment.
• Develop a framework and roadmap for the application of CLC using three exemplar clinical areas
• Address gaps in technology and knowledge via eight feasibility studies or secondments (£50k-£60k per project)
• Develop funding applications that address major healthcare challenges
• Raise awareness of potential for using CLC to deliver personalised medicine
Projects

Smart Active Footbed for Wound Prevention and Management
(University of Derby)

Combining physiological sensing and biomarkers with intelligent support surfaces for closed loop prevention of chronic wounds
(University of Southampton)

Closed-loop control for optimising chemotherapy infusion
(University of Warwick)

Closed loop infection control using biocompatible wound dressings
(University of Westminster)

Surface Polymer Imprinted Closed Loop Optical Patient Sensors for Dose Detection and Prevention of Cancer Resistance (University of Nottingham)

Investigation of closed-loop ventilation strategies for neonatal ICU patients using computational simulation (University of Warwick)

Closed loop drug monitoring and delivery in intensive care
(University of Leicester, NUH)
Medical devices and vulnerable skin

www.southampton.ac.uk/mdvsn

The Network's strategic aims are to introduce cutting-edge technologies and scientific understanding in order to reduce the incidence of mechanical-induced damage of vulnerable skin caused by interventional medical devices in various clinical settings. (driven by clinical problem)
Clinical engagement, utilises other networks (devices for dignity, woundtec, newmind) 
Raises profile as an area of unmet clinical need
Events

Cyclops

Grand Challenge Workshops
(50+, 2 days)

International keynotes

Facilitators & magicians

Shaping future proposals

MDVSN

One day events, presentations and workshop activities
(2-3/year)
It’s a good idea..

- Form multidisciplinary community to address a research challenge
- Networking (academia, industry, clinical, other networks)
- Stimulating workshops
- Pump priming funds
- Opportunity to raise profile of a community (UKRI, other funders, policy makers)
- May bring future research funding ..
It’s a bad idea..

• You are a mini research council!

• Calls for proposal and panel assessment

• Contracts between Universities (~12 different legal departments)

• Universities didn’t understand large ‘other costs’ flexible feasibility fund
Coordinating the network

- Maintaining interest in the network (pump priming, follow on funding applications) – don’t allocate all funds too early
- Ensure all engage at network events (use facilitators)
- Good governance/advisory board – you are responsible for the pump priming funds (and may also be involved in bids)
- Ensure diversity (disciplines, stakeholders, region, ECRs, EDI)
- Make sure finance and legal depts at your University are involved early
- Hire magicians
It’s a worthwhile experience

Good luck!
What I wish I had known or thought of before applying

- Professor Gail ter Haar, The Institute of Cancer Research
  - Therapy Ultrasound Network for Drug Delivery & Ablation Research (ThUNDDAR)
    - https://thunddar.org/
  - Challenges and lessons learned
EPSRC Network Plus: Challenges & lessons learnt

Therapeutic Ultrasound Network for Drug Delivery & Ablation Research

ThUNDDAR  www.thunddar.org

Gail.terhaar@icr.ac.uk
The Origins of ThUNDDAR

Healthcare Technologies
Grand Challenges
NetworksPlus
High intensity applications:
HIFU/FUS

Undamaged liver in front of focus
'Lesion' of coagulative necrosis at focus (12x3mm)
Example of clinical use of bone heating

Patient with painful bone metastasis

- Post treatment imaging shows no adverse features
- Pain scores reduced
- Range of movements greatly increased
- No analgesia now being used

At Day 90, pain score 0 at rest and also 0 at maximal abduction (previously unable to abduct arm)
6 months post HIFU, pain response maintained
No adverse events

Patient 1 Pain Scores
Low intensity applications: US mediated Local Drug Delivery

Low Temperature Sensitive Liposomes (TSL) – Hyperthermia

Key Benefits: High dose (10x) of Chemotherapy targeted at tumor sites with reduced systemic toxicity

Duke University

Drug circulates to tumor
Drug extravasates under HIFU Heat & Pressure
Drug released locally by HIFU Heat & Pressure
The Aims of ThUNDDAR I

To bring together:
Scientists (engineers, physicists, mathematicians, chemists, biologists etc)

Industry
Clinicians
Patient groups
Regulatory bodies

to identify and break down existing, and future, barriers to the use of therapeutic ultrasound in the UK and throughout the world.
The Aims of ThUNDDAR II

To enable the potential of therapeutic ultrasound to be fully realised.

By addressing (for example):
- the poor understanding of the mechanisms of action,
- lack of effective treatment monitoring,
- absence of standardised treatment protocols,
- poor communication between basic scientists, engineers and clinicians.

Through the stimulation of translational research
ThUNDDAR activities

Meetings:
- Sandpits
- One Day meetings (THUGs) – 2/year
- Summer Schools (3 in total)
- One day subject specific workshops
- Specialist sessions at other meetings

Research:
9 X 6 month collaborative pilot studies (£50k/project)

Education & Training:
- Degree course
- Exchange visits

Website
User engagement
Fellowships
Examples of Pilot funding so far

Investigation of the ability of gas-filled nano-bubbles to deliver hydrophobic and hydrophilic compounds to the brain by disruption of the blood brain barrier using focused ultrasound
Edinburgh/Leeds

Deep-learning for Cavitation Detection
NPL/ICR/IC/Oxford/Leeds

Frequency optimisation for opening the blood brain barrier
UCL/IC/PA

Mechanistic study of acoustic emissions from controlled microbubble populations exposed to focused ultrasound
Glasgow,/Leeds
Challenge 1: membership

To assemble an initial group of interested parties – research/users/regulators/funders

To propose methods of growing the group over the duration of the network
ThUNDDAR founding members

Expertise
- Biology
- Chemistry
- Clinical
- Engineering
- Mathematics
- Physics
- Pharmacy.

Management committee
Co-Is
- Gail ter Haar ICR
- Steven Freear Leeds
- Wady Gedroyc Imperial
- Nader Saffari UCL
- Eleanor Stride Oxford
Challenge 2: Governance & Finance

Well developed management plan

- Identify management (5) & steering committees (10) with enthusiastic buy-in from members
- Outline clear management & risk strategies from outset
- 80% FEC – make clear where extra 20% comes from

Delegate! Make sure people outside these committees have roles to ensure wider engagement
Challenge 2: Governance & Finance

Award £830k (100%)

PI: 10% time
Co-Is (4): 5% time
admin: 10% time

Travel: £42k (exchanges/fellowships)

Sandpits/workshops: £100k

Comms: £10k

Pilot studies: 9 x £50k (funded at 80% ie. £40k)
Challenge 3: engagement

Buy in from various categories of network membership

Researchers: not difficult, especially if there may be money!
Users: Clinicians & patients. Difficult to ascertain best time for them to meet
Funders/regulators: need to work hard to get engagement.
Challenge 4: communication

A good website is essential
Website: http://www.thundddar.org/

As is other social media
Twitter: @TUNDDAR
ThUNDDDAR youtube channel: 221 subscribers
Lessons learnt

- Allow more management time than you think you need
- Delegate – engagement comes from involvement
- Include as many key players as possible in management committee
- Keep in contact – newsletters and other information. Out of sight, out of mind.
- In order to maintain momentum between meetings and funding calls need other activities – ThUNDDAR live!
Is YOUR network

Volunteer,
Attend
Get involved
Apply
The Aims of ThUNDDAR III

To promote collaborations addressing, eg:

- the development of synthetic pre-clinical models;
- patient specific predictive modelling and treatment planning;
- lack of consensus and consistency in dosimetry and treatment protocols;
- the use of combination therapies such as therapy ultrasound and radiotherapy;
- the development of new devices and strategies for improving the evidence base of therapeutic ultrasound to accelerate its transition into the clinic.
Questions for the presenters
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<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Award Description</th>
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<tbody>
<tr>
<td>Culmer, Dr PR</td>
<td>University of Leeds</td>
<td>EPSRC-NIHR HTC Partnership Award 'Plus': IMPRESS</td>
</tr>
<tr>
<td>Williams, Professor DJ</td>
<td>Loughborough University</td>
<td>EPSRC-NIHR HTC Partnership Award 'Plus': UNIFY Plus</td>
</tr>
<tr>
<td>Bader, Professor DL</td>
<td>University of Southampton</td>
<td>EPSRC-NIHR HTC Partnership Award 'Plus': Medical Devices and Vulnerable Skin: Intellegent sensing to promote self-management.</td>
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<tr>
<td>Yang, Professor G</td>
<td>Imperial College London</td>
<td>EPSRC-NIHR HTC Partnership Award Plus Funds: Technology Network-Plus on Devices for Surgery and Rehabilitation</td>
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<tr>
<td>Morgan, Professor SP</td>
<td>University of Nottingham</td>
<td>Closed loop control systems for optimisation of treatment</td>
</tr>
<tr>
<td>Taylor, Professor CJ</td>
<td>The University of Manchester</td>
<td>EPSRC-NIHR HTC Partnership Award 'Plus': NewMind - Partnership with the MindTech HTC.</td>
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<tr>
<td>Ourselin, Professor S</td>
<td>King's College London</td>
<td>EPSRC UK IMAGE-GUIDED THERAPIES NETWORK+</td>
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<tr>
<td>Nenadic, Professor G</td>
<td>The University of Manchester</td>
<td>Healtex: UK Healthcare Text Analytics Research Network</td>
</tr>
<tr>
<td>Noble, Professor A</td>
<td>University of Oxford</td>
<td>EPSRC-NIHR HTC Partnership Award 'Plus': Medical Image Analysis Network (MedIAN)</td>
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<tr>
<td>Cox, Professor AL</td>
<td>University College London</td>
<td>GetAMoveOn:transforming health through enabling mobility</td>
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<tr>
<td>Flewitt, Professor AJ</td>
<td>University of Cambridge</td>
<td>Fast ASsessment and Treatment in Healthcare (FAST Healthcare)</td>
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<tr>
<td>ter Haar, Professor GRt</td>
<td>Institute of Cancer Research</td>
<td>Therapy Ultrasound Network for Drug Delivery &amp; Ablation Research (ThUNDDAR)</td>
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<tr>
<td>Holt, Professor C</td>
<td>Cardiff University</td>
<td>Osteoarthritis Technology NetworkPlus (OATech+): a multidisciplinary approach to the prevention and treatment of osteoarthritis</td>
</tr>
<tr>
<td>Kirkby, Professor KJ</td>
<td>The University of Manchester</td>
<td>Grand Challenge Network+ in Proton Therapy</td>
</tr>
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</table>
Feedback

- Ask that you provide us feedback on how you felt the webinar went…
  - Is a webinar a good way of convening this type of information?
  - What did you like?
  - What would you change?
  - What would make this type of event more useful?
  - What sort of support would you like to see from EPSRC?
<table>
<thead>
<tr>
<th>Activity</th>
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<tr>
<td>Outline call opens in JeS</td>
<td>1 July 2020</td>
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<tr>
<td>Webinar</td>
<td>22 July 2020</td>
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<tr>
<td>Intent to Submit</td>
<td>4 September 2020</td>
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<tr>
<td>Outlines call closes</td>
<td>15 September 2020</td>
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<tr>
<td>Outline panel meeting</td>
<td>29 October 2020</td>
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<tr>
<td>Invitation to full proposals</td>
<td>2 November 2020</td>
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<td>Deadline for full proposals</td>
<td>13 January 2021</td>
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<tr>
<td>Interview panel meetings</td>
<td>w/c 15 March (over 2 days)</td>
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</table>
Thank you

Jeanine.woolley@epsrc.ukri.org
Kate.reading@epsrc.ukri.org

https://epsrc.ukri.org/funding/calls/healthcare-technologies-new-challenges-networkplus/