EPSRC IRC in
Early Warning Sensing Systems for Infectious Diseases

Project Handbook

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Introduction

The IRC aims to engineer a new generation of early-warning sensing systems to diagnose, monitor and prevent the spread of infectious diseases. This is a large-scale collaboration that will bring together a diverse set of researchers from many disciplines, with clinicians, government organisations, the NHS and industry partners.

This is an ambitious and challenging project that promises to deliver major human and economic benefit through better identification, treatment and prevention of infection. Promised outcomes include diagnostic prototypes, web-based early-warning systems, target product profiles based on end user needs, publications, new collaborations and new grants.

This handbook aims to act as a resource for useful project information towards achieving these goals. The document is 'living' and will evolve over the lifetime of the project, this being Version 1.1.

Project Partners

The current project partners, who are party to the IRC Collaboration Agreement, are as follows:

> University College London (UCL) – Lead Institution
>
> Imperial College London (ICL)
>
> London School of Hygiene and Tropical Medicine (LSHTM)
>
> Newcastle University (UNEW)
>
> University of Surrey (USUR)
>
> Public Health England (PHE)

Confidentiality

If you are a member of one of the partner institutions, you are bound by the confidentiality terms in the Collaboration Agreement. All members should read this section in the Collaboration Agreement.

These confidentiality terms are designed to allow you to share information freely within the IRC, without jeopardising anyone's intellectual property.

In summary, you should keep all information discussed by IRC partners or during IRC meetings as secret and confidential. You can disclose this information to other IRC members, employees or students, where necessary. However, it is your responsibility to make sure any one you share with is bound by, knows of and understands these confidentiality terms.

Useful Contacts

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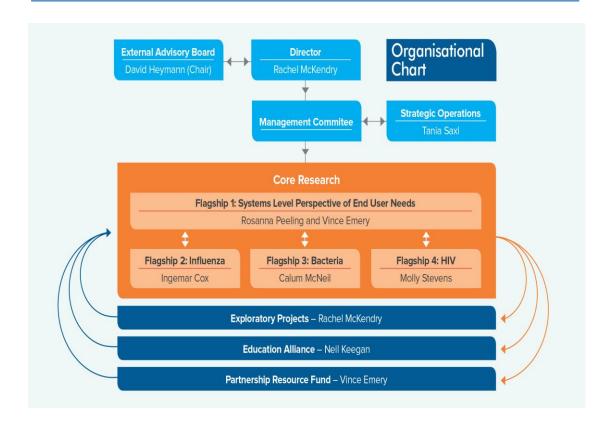t: +27 (0) 35 550 7509

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IRC Structure

Core research

Flagship 1

Flagship 1 aims to evaluate the systems performance characteristics required for our early-warning sensing systems based on an understanding of end-user needs, the impact on existing clinical diagnostic practices and the impact on surveillance practices.

Flagship 2

Flagship 2 will engineer big data analytical methods for search and social media data to nowcast flu in the UK and monitor the effectiveness of interventions e.g. vaccines. In parallel, early stage research will be undertaken to develop a home test for influenza, integrating mobile diagnostics, based on smartphone camera readers, microfluidics and advanced nano materials.

Flagship 3

Flagship 3 aims to develop mobile diagnostics to detect bacterial infections in care homes. Bioinformatics will be used to identify novel surface-accessible proteins and develop novel capture ligands for a range of platform technologies, including low power CMOS chips, to wirelessly transmit results.

Flagship 4

Flagship 4 will undertake early-stage research to develop simple, low-cost microfluidic tests, using advanced nano materials and nano body capture ligands. In partnership with the Africa Centre, this flagship will also build a digital dashboard to link newly diagnosed people to follow up care in local clinics.

Exploratory Projects

A range of high-level, themed Exploratory Project calls will be designed to enable the full potential of the IRC partnerships to be realised. These projects are intended to be short, high-risk new collaborations (3-12 months), between two or more partners in the IRC and will be an exciting complement to the Core Research Programme. Themed calls will focus on technology gaps in the consortium, and the first call will be announced 6 months after the start of the IRC.

Education Alliance

The Education Alliance will jointly introduce new teaching courses and training in sensing systems to postgraduate students. It aims to integrate doctoral training schemes and studentships from diverse disciplines across the four academic partners, to make the IRC a major UK and global destination for career development in sensing systems.

Partnership Resource Fund

The aim of the partnership resource fund is to grow the IRC into a self-sustained hub of innovation, bringing in new academic, clinical and industry partners to complement and strengthen the expertise of the consortium. The PRF will be used to promote a new culture of engagement and bold forward thinking initiatives between academics, the public, patients, clinicians, industry, regulators, policy makers and the media.

Management

Management Committee

The Management Committee will ensure the IRC portfolio has an appropriate research balance and will re-allocate budgets accordingly. It will also provide strategic advice to the EPSRC and government on the national research landscape and clinical needs. The committee meets every two months to review the project budget and ensure milestones and deliverables are achieved. In summary, the management committee's role is to:

- Ensure overall performance of the IRC relative to Key Performance Indicators
- Make IRC funding decisions
- Disseminate and exploit outcomes of IRC research
- Oversee the Core Research
- Oversee the Exploratory Projects

External Advisory Board

The External Advisory Board is made up of independent advisors to the IRC, who will meet once a year. The role of the board is to:

- Support the sustainability, growth and development of the IRC
- Share knowledge of end user needs
- Advise on funding strategies
- Assist in developing strategic academic and industrial partnerships
- Support exploitation of technology arising from the IRC
- Give broader advice on end-user needs, exploitation and long-term sustainability of the IRC

Strategic Operations Team

The Strategic Operations Team is responsible for engaging with the Partner Institutions and maximising the impact of the project research. The role of the Strategic Operations Team is to:

- Assist with IRC strategy and direction
- Administer the IRC, including managing finance, website and communications
- Provide overall project management
- Provide administrative support for Director and Management Committee
- Work with the Management Committee to disseminate and exploit outcomes of research
- Assist in the formation of industrial and strategic partnerships
- Assist with translational strategy, obtaining follow-on funding, filing of patents, management of IP and enterprise activities
- Be accountable to the External Advisory Board for day-to-day management of the IRC
- Provide bimonthly reports to Management Committee

Flagship Teams

The role of the Flagship teams is to:

- Undertake core research
- Generate technical objectives
- Ensure achievement of milestones and deliverables
- Generate brief monthly reports and more detailed quarterly written and oral Flagship reports (templates provided by the Strategic Operations Director)

Key Performance Indicators

Research Targets

- Growth and development of the clinical and industry user base; 10-20% growth by Year 3
- Growth of the Centre academic network at 10% pa through Partnership Resource Funds
- Output of high impact peer reviewed material (e.g. Nature, Lancet) / presentations at conferences
- Centre methods and IP exploited by industry partners and the user community (from Year 3 onwards)

People Targets

- Creation of postgraduate teaching material by the Education Alliance and growth of skills in the students and PDRAs in the Collaboration
- Flow of skilled personnel into the industry; permanent and on secondment
- Success of networking, workshop and dissemination events

Policy Targets

- Recognition of the Centre as the UK's prime resource in the diagnostics & surveillance healthcare sector
- Defining the future research agenda for disruptive sensing systems for healthcare.

Project Briefs

Each of the Flagships, the Partnership Resource Fund, Exploratory Projects and Education Alliance will all have a 'Project Brief' for 2013-2015 and another one for 2016-2018. This Project Brief will comprise of a short summary, followed by a list of around four to eight objectives. These objectives will then be further broken down into tasks, with time scales and associated risks.

These Project Briefs will be available to everyone, for reference, in the shared IRC dropbox folder, and eventually from the website when it is launched, under a secure login.

These documents are designed purely for internal purposes, to aid with planning, communication and reporting. They are designed to be reviewed on a regular basis and are therefore liable to change and develop over the course of the project.

If you have any questions about the Project Briefs, please email the Strategic Operations Director, Tania Saxl <t.saxl@ucl.ac.uk>

Reporting

Reports are due from each Flagship Team on a monthly, quarterly and annual basis. These are to be written based upon the relevant flagship Project Brief and are to address each objective and task in the brief, giving the progress, risks and issues and plan for the next period.

Monthly Reports

Brief monthly reports from each Flagship are due on the last Friday of each month, following the monthly flagship meetings, and should contain outcomes from the meeting as well as a progress report, and risk analysis for that month. The template for this report is provided by the Strategic Operations Team.

Quarterly Reports

A more detailed quarterly report is required from each flagship. Again, the template for this is provided by the Strategic Operations Team.

Annual Review

The Annual Review is to be compiled by the Flagship Leads with the help of the Strategic Operations Director.

Report Authors

Flagship 1   Lead: Rosanna Peeling (LSHTM)
              Report Author: Olivia Varsaneux (LSHTM)

Flagship 2   Lead: Ingemar Cox (UCL)
              Report Author 1: Vasileios Lampos (UCL)
              Report Authors 2: Eleanor Gray (UCL), Philip Howes (ICL)

Flagship 3   Lead: Calum McNeil (UNEW)
              Report Author 1: Chris Johnson (UNEW)
              Report Authors 2: Virgilio Valente (UCL)

Flagship 4   Lead: Molly Stevens (ICL)
              Report Author 1: Michael Thomas (ICL)
              Report Authors 2: Jenny Brookes (UCL)

Email protocol

In order to track progress efficiently and aid with communication, all collaborative IRC emails between departments and institutions should c.c. the Strategic Operations Director, Tania Saxl <t.saxl@ucl.ac.uk> and the Director, Rachel McKendry <r.a.mckendry@ucl.ac.uk>. Flagship emails should c.c. all members of the particular Flagship.

Email subject header

Some of the partners in this IRC work on multiple large-scale projects. For this reason it is helpful for filtering if all IRC emails are titled with the wording 'IRC' and, if relevant, the Flagship number (abbreviated to 'Flag'), followed by a more detailed description of the subject. For example an email title should look something like:

'IRC Flag 1: Monthly meeting Tuesday 26th'

Website

Primary contact for website: Kailey Nolan, Communications and Administration Officer. Any ideas you have for the website or IRC communications in general can be directed to Kailey, or your working group representative.

Website working group

Each IRC member organization will be represented on the website working group, which will meet to discuss website strategy, content and opportunities. The working group members will be responsible for relaying relevant information about their group or institution, for example on publications or events, to the Communications Coordinator.

Website working group members

Kailey Nolan (UCL)	Virgilio Valente (UCL)	Vasileios Lampos (UCL)
Becci Sharrock(UNEW)	Philip Howes (ICL)	Freddie Bates (LSHTM)

File sharing

In addition to the website, we built a platform to allow us to store and share important documents including the following:

- Collaboration Agreement
- Project Briefs
- Reports

- also templates, talks, databases and other shared documents

We are also using a set of dropbox folders to share files. These are currently:

- EPSRC IRC (for Management Committee and report authors)
- EPSRC IRC Website (for Website Working Group)

If you have any questions about sharing or accessing files, please contact Kailey Nolan at <k.nolan@ucl.ac.uk>