Precision AMR

NIHR Infrastructure award £3.3 million:

Lead Investigator: Judy Breuer

Co-Investigators: Mervyn Singer, Peter Wilson, Elaine Cloutman Green, Jo Standing, Francois Balloux

September 2019- August 2021

Largely equipment, refurbishment and a few staff.
How will we achieve this

**Developing new diagnostic tools**
- Development of new wet lab methods
- Improving bioinformatics tools
- Comparison of existing technologies

**Improving quality and speed of results to ward**
- RCTs of new diagnostics to establish need and health economics
- Linkage to EPR to change working practices
- PoC tests

**Changing clinical management to reduce AMR**
- Collecting EPR data on prescribing behaviour
- Changing patient management pathways
- Audit using EPR
- Staff Patient and Public education
How will we achieve this

**Strategy Committee**
Programme directors/ deans- Faculties of Medical & Life Sciences/ Project manager/ AMR experts/ Lay advisor/ UCL Finance officer

**Science Committee**
Programme directors/ Vice Provost/ Chair Micobiology Domain/ AMR experts/ Project manager

**User Group**
Programme directors/ AMR experts/ Project manager/ facilities/ Lay advisor/ UCL estates/ UCL/UCLH/ Data Science team/ Lab managers

**Core Facilities**
- PGU
- Hollow Fibre Lab
- Clinical Seq Lab (GOSH)
- Clinical Seq Lab (HSL)
- Clinical Sampling Lab
- Translational Data Group

**Programme Staff**

**Partners:**
- All, project manager, AMR experts, data scientists, nanotech scientists, behavioural scientists, research nurse
- UCL/ GSL/ GOSH
- Microbiologists, Infection prevention and control, Clinical Scientists, BMS
- UCLH/ GOSH/ MMC
- Clinical Teams, Outpatients, Antibiotic Stewardship, Managers

**Patient and Public**
- Lad advisor, Drama Team, Events
How will we achieve this

Equipment and staff in five facilities to support improved development, assessment and delivery of laboratory diagnostics for management of AMR

Technical laboratory and computing support to support projects that address aims of grant

Workshops to Inform researchers, stimulate projects and feedback results

Seed grants to generate pilot data

Patient Public Involvement to share ideas and results
Proposed infrastructure

**UCLH/HSL and GOSH Clinical Research laboratories**
- Samples for research
- Equipment and Clinical scientist core support for helping with AMR research
- Bioinformatics support

**UCL (PGU/UCL Genomics)**
- Support for development and application of new genomic technologies to AMR research
- Pathogen nucleic acid extraction
- Core laboratory support for project design and implementation
- Core bioinformatics support for software design, data analysis and project support

**Hollow Fibre Facility (GOSH/RFH)**
- Pharmacodynamic and pharmacokinetic measurement and modelling of antimicrobial combinations
- Core scientist support for project design and implementation
Proposed infrastructure

**Clinical Sequencing Facilities**
- Support for sample collection from community based patients and RCTs
- Support for obtaining ethical approval to use anonymised microbiology samples (UCLP pathogen biobank)
- Support for obtaining approval to use anonymised patient data, linked patient data and samples and identifiable patient data and samples

**Translational Data Science Group**
- Support for retrieving and using electronic patient health records
- Support for linking EHRs to laboratory samples
- Support for project design and implementation

**Public Patient Involvement (PPI)**
- Support for incorporating PPI into projects
- Support for public patient facing projects
Outcomes

Infrastructure

All facilities to establish criteria for open access and cost recovery by end of the grant (now August 31st 2021)

All facilities to establish succession plan for staff and facilities by the end of the grant.
Outcomes

AMR research

Pilot data on studies addressing:

- New rapid tests to improve detection and monitoring of AMR
- How laboratory results linked to EPR address aims of the grant
- AI to identify best and worst AM prescribing practice
- Methods to change AM prescribing practice

RCTs to test results from pilot studies against standard of care

Industrial involvement in development and implementation of methods to reduce AMR
Outcomes

**Leveraged funding for**

Basic science: microbial genomics, metagenomics microbial physiology (UKRI Wellcome, charities)

Test development: nanotechnology, genomics, software (UKRI Wellcome Industry)

Device evaluation: RCTs to evaluate impact of new devices/tests for AMR (UKRI /Industry)

Applied research: NIHR/EPSRC etc funding to identify patterns of prescribing and to evaluate how to change AM prescribing behaviour (UKRI/ Industry)
Outcomes

Critical mass in Microbiology and Infection Research

Empower AMR research across UCL

Engender research using linked patient records

Underpin growth in Infection research at UCL/UCLH/GOSH/BRCs
Workshop One: February 17th:
To explain the grant
Provide road maps for researchers to develop seed projects

Seed projects >20 x £16,000
Call opens: February 17th 2020
Deadline: May 11th 2020 (14 weeks)
Awarded: June 1st 2020
Report: January workshop 2021

Clinical Laboratory Scientist call £16,000 to be awarded
Call Opens: February 17th 2020
Deadline: 1st May 2020 (14 weeks)
Awarded: 1st June 2020

Workshop Two: January 2021
To showcase projects and review progress
To discuss future plans

Rise of the Resistance July 2020:
To present results to stakeholder, public and patients
Key Information

**Precision AMR Manager**
- Saadia Rahman

**Facility leads**
- CSFs: GOSH: Kathryn Harris; HSL/ULCH: Mike Gandy/Vikki Enne
- PGU: Rachel Williams/Judy Breuer, wet lab; Francois Balloux/Judy Breuer Bioinformatics
- HFL: Joe Standing
- TDSG: Stefan Piatek/John Booth
- CSL: Michelle Berkley/Maddy Noursadeghi
- PPI : Sue Lee/Nicola Baldwin/ Elaine Cloutman Green

**AMR experts**
- Peter Wilson : Consultant Microbiologist: AMR policy, national priorities, POC
- Mervyn Singer: Consultant ITU: RCTs on rapid interventions to alter AMR prescribing
- Francois Balloux: Basic Scientist annotation of AMR at genome level
- Elaine Cloutman Green: NIHR lecturer in IPC. Harnessing new technologies to change IPC
- Jo Standing: Research pharmacist, mathematical modeller, expert on drug kinetics
- Laura Shallcross: NIHR Professor population health: EPR and AMR
- Vikki Enne: RCTs to evaluate new technologies for precision prescribing