Department of Health & Social Care

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.

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How will we achieve this

Precision AMR

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

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How will we achieve this

Precision AMR

Management

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

Participant End Users

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

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How will we achieve this

Precision AMR

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

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Proposed infrastructure

Precision AMR

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

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Proposed infrastructure

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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

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Outcomes

Precision AMR

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.

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Outcomes

Precision AMR

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

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Outcomes

Precision AMR

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)

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Outcomes

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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

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Process

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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 £16,00 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

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Key Information

Precision AMR

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