Novel targets for new drugs

Antibiotics mostly hit a few of the essential processes in the bacterial cell. We are doing fundamental research into the identification and validation of new targets, for example:

- **DNA replication as a drug target** – Our near-unique ability to replicate this process in the test-tube is being exploited to screen for novel inhibitors in a collaboration between our biologists and chemists.¹

- **The biosynthetic machinery in biofilm formation**¹

- **Targets for co-drugs that undermine innate resistance mechanisms**¹

Multidisciplinary approaches to diagnostics

Rapid point-of-care diagnostic technologies have been widely recognized as essential to antibiotic stewardship and effective treatment of infections. Projects include:

- **Photonics and multiplexed biosensors** – by combining our expertise in harnessing light with exquisitely sensitive biosensors, we hope to cut times to diagnosis of the infectious agent (including its AMR profile) from 72 hours to less than a few hours.²

- **Real-time monitoring of infection** – by combining Ramen spectroscopy with infections, state-of-the-art computational methods, we aim to improve the diagnosis of sepsis.³

And more...

Our environmental scientists are researching the fate of antibiotics in waste water and soil;⁴ our physicists are harnessing low temperature plasma as a bacteriocidal agent;⁵ and our synthetic chemists are designing new classes of antimicrobial compounds.⁶

Approach – Tackling AmR with Goal-orientated Thinking in the EPS Disciplines

The need for society, medicine and science to respond to the challenges of AMR is clear. Novel solutions to the problem are likely to come from integrated multidisciplinary working that is goal-orientated, yet agnostic and open to the inputs and routes to the goals. We want to ensure that the very best features of academic-led, curiosity-driven research (strong personal engagement, commitment, innovation and vision) are harnessed for this goal-orientated, topic-driven research area.

Our two-year, EPSRC-funded ‘TARGeTED’ programme will help us deliver multiple objectives:

- A culture of engagement with ‘goal-orientated’ thinking across all the disciplines
- A clear and shared understanding of the elements of the AMR challenge that UoY is best placed to address
- Develop and foster collaborations to enable knowledge exchange and create proof-of-principle research

Mechanisms

- Facilitated workshops
- Research priming funds
- Communication awareness training
- Industry engagement events
- Travel funds
- Public engagement