

The catastrophic threat of antimicrobial resistance

Cat Ball (Science Policy Advisor)

Dame Sally Davies, Chief Medical Officer for England, has described antimicrobial resistance (AMR) as a ‘catastrophic threat’ to the world, akin to terrorism or climate change¹. Here at the Biochemical Society, this is a message that we have received loud and clear.

What is more, the threat is building. Although the development of resistance to antimicrobials is a natural evolutionary process, it is being accelerated by abuse and misuse of therapies. Furthermore, the flow of new antimicrobial agents is diminishing and the result is a crisis in the making.

There is public awareness of the need for determined action to avert potential treatment failure, as shown by the public’s vote for antibiotics to be the topic of the new re-versioned Longitude Prize². There is also broad agreement among key experts, brought together through the Department of Health’s UK Antimicrobial Resistance Strategy³. It is vital that this awareness and agreement is now translated into tangible actions.

AMR must be mitigated using a multi-faceted approach including improving infection prevention and control measures, optimizing prescribing practices and prioritizing research and development. This will require political will and international coordination across both human and animal medicine and agriculture, as well as new funding.

AMR research is both highly inter- and multi-disciplinary in nature. Researchers across a range of disciplines – from biochemistry to engineering to clinical science – must work together in order to develop novel solutions. Such solutions could include new medicines

and therapies, the development of novel antimicrobial materials and surfaces and rapid diagnostics (the subject of the Longitude Prize).

In recognition of this, funders and other key stakeholders have come together to create an AMR Funders Forum (AMR FF)⁴. This includes Research Councils, Health Departments, Governmental bodies as well as charities with a direct or indirect interest in AMR and which provide significant R&D budgets in the area. Secretariat for this group is provided by the MRC. The AMR FF has produced a series of themed calls for research proposals on a variety of different aspects of AMR research, many of which will be relevant to biochemists⁵.

In the summer of 2014, David Cameron announced the Government-commissioned O’Neill Review. This major international review, hosted by the Wellcome Trust, is looking broadly at the economic issues surrounding antimicrobial resistance, including how to incentivize the drug pipeline so that new drugs are developed, but also focus on existing antimicrobials and how they can better be used to treat illness. The review is being led by renowned economist Jim O’Neill, with backing from the Department of Health and HM Treasury⁶.

AMR is a global problem and it is imperative that it is treated as such. The World Health Organisation (WHO) acknowledged this in their report on global surveillance of AMR⁷. This was extended upon in the recent publication of their action plan on AMR. This decrees that all member states should have action plans in place within two years that are in line with the



WHO global action plan. These plans must include whole-of-society engagement, prevention first, access not excess, sustainability and incremental targets for implementation.

The Biochemical Society has a varied membership including biochemists active in drug discovery and novel therapeutics development in both academic and industrial settings. The Society believes that there should be sustained research funding to drive the development of new antimicrobials and rapid diagnostics as well as alternative approaches to combating infection, particularly vaccines. Partnerships between industry and academia, and public-private partnerships, will be vital to promote research into new antimicrobials and alternatives. Furthermore, regulatory processes for drug approval and incentives for private research must be addressed and reviewed to facilitate the development of new therapies.

One of the vital strands of antimicrobial therapy is antibiotics. To this end, the Biochemical Society supports

the work of Antibiotic Action⁸. This campaign seeks to inform and educate across society regarding the need for discovery, research and development of new antibiotics.

The Biochemical Society is working with the British Society for Antimicrobial Chemotherapy, the British Pharmacological Society, the Royal Society of Chemistry, the Society for Applied Microbiology, the Society for General Microbiology and the Society of Biology as part of a Learned Societies Partnership on AMR. This grouping aims to provide a single, unified voice and mobilize the UK's collective research community in order to enhance understanding and knowledge sharing between academia, industry, and clinicians. The group is focused on taking action, championing best practice and raising awareness of the global challenge of antimicrobial resistance.

The Biochemical Society believes that it is vital to the health of all nations that antimicrobials remain a mainstay of modern medicine and are available to all who need them. ■

References

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