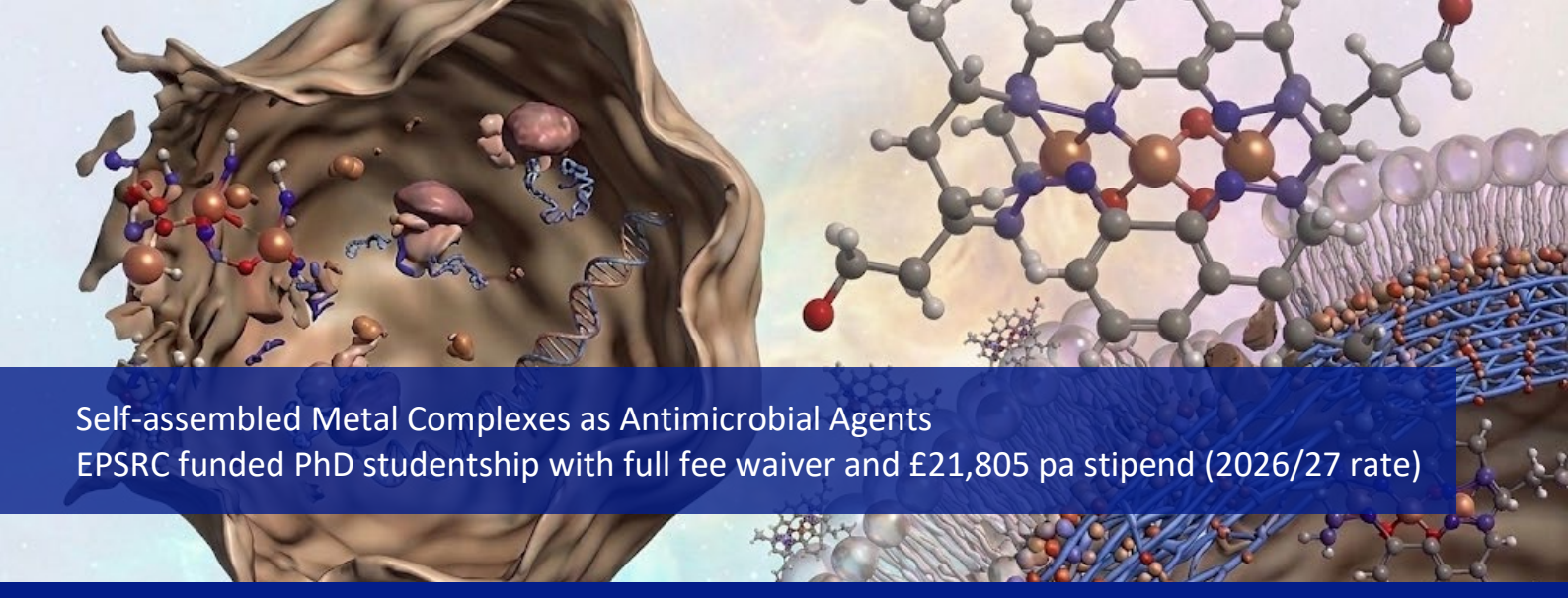


# Self-assembled Metal Complexes as Antimicrobial Agents
## EPSRC funded PhD studentship with full fee waiver and £21,805 pa stipend (2026/27 rate)

**Project Code:** DLA_DTP_2026_06

**Main Supervisor:** Professor Craig Rice

**Co-Supervisor:** Dr Simon Allison, Dr Anthony Slate, Dr Martina Whitehead, Prof Karen Ousey (External)

### Project Introduction

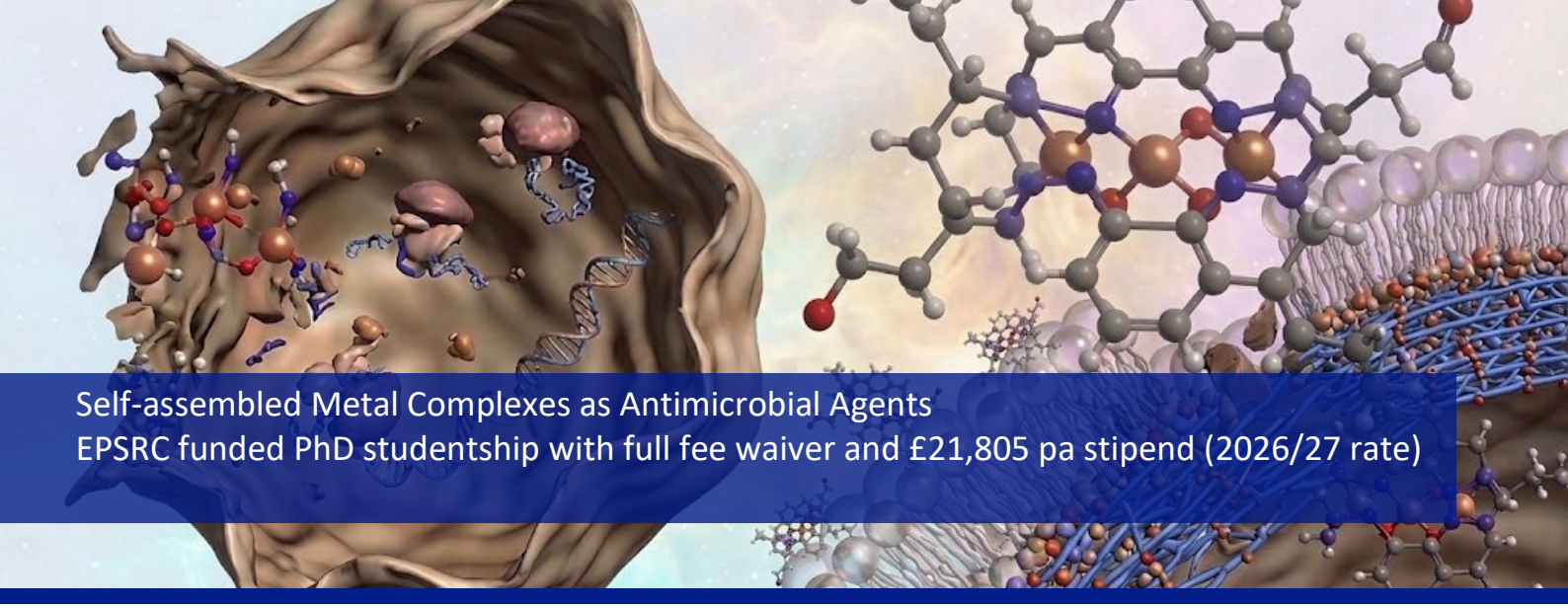
We have recently discovered that certain self-assembled systems can act as potent antimicrobial agents. These 'self-assemblies' as putative antimicrobial agents would be '*first-in-class*' and could be advantageous over current therapeutics, as the compounds can be modulated easily by either changing the ligand architecture or the coordinated metal ion. This offers a unique opportunity to rapidly optimise the compounds to enhance antimicrobial activity and may reduce the generation of antimicrobial resistance (AMR). Due to the compound design, they could be changed quickly, counteracting the ability of bacteria to adapt and become resistant.

### Project Details

During the EPSRC funded grant "*Self-Assembled Cryptate Kinase Inhibitors as Anti-Cancer Therapeutic Agents"* we serendipitously discovered that self-assembled compounds were highly toxic to clinically-relevant bacteria (whilst relatively innocuous to healthy normal human cells). Recent studies have shown our lead compound is highly toxicity towards antibiotic resistant bacteria such as MRSA with a Minimum Inhibitory Concentration (MIC) of ~ 0.75 μM, comparable with Vancomycin (MIC = 0.4 μM) which is the treatment of last-resort for life-threatening Gram-positive infections. Antimicrobial resistance (AMR) occurs when microorganisms like bacteria develop mechanisms that promote the ability to withstand the effects of antimicrobial therapies, enhancing disease mortality and disease transmission. AMR is a global health threat, as it jeopardizes the effectiveness of treatments for various infections, potentially leading to more severe illnesses and deaths. Antimicrobial resistance (AMR) poses a significant economic burden, with estimates suggesting potential healthcare cost increases and GDP losses reaching trillions of dollars annually by 2050.

This work package would be aimed at the testing of a library of novel compounds that have previously been synthesised within the *Rice* and *Whitehead* laboratory but as yet their anti-microbial properties remain unexplored (https://pubs.rsc.org/en/content/articlehtml/2026/dt/d6dt00038j). Initially compounds will be investigated for their minimum inhibitory and bactericidal concentrations, their potential for resistance generation and their mechanism of action. This will allow us to establish structure activity relationships that will guide the future development of novel complexes (e.g. design → synthesis → activity → redesign) improving the desirable properties (e.g. greater toxicity to bacteria) whilst maintaining their selectivity (e.g. low human cell cytotoxicity). In addition to this, compounds are being synthesised and investigated that are not only toxic to bacteria but are also able to identify and locate the presence of bacteria via a modulation of the compounds photophysical properties. Enabling the healthcare provider to locate and selectively remove bacterial mass (debridement) with enhanced precision. Correspondingly, the project would also involve the investigation of compound adherence to the bacterial cell envelope and modulation of its viable properties (via reflectance UV-Vis and confocal microscopy).

In collaboration with Professor Ousey, our aim is to investigate a topical treatment for open wound infections. Open wounds are a considerable issue for healthcare providers especially if the infecting bacterial pathogen is MRSA (an infection which the described compounds have exhibited high antimicrobial activity), due to its resistance to antibiotic therapies, with the NHS spending ~£9 billion per annum on chronic wound care alone.



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### Project-specific entry requirements

Good degree in Biology with specific experience in microbiology advantageous.

### Further Information

This call is open to **UK Applicants only**.

Applicants should be of outstanding quality and exceptionally motivated.

The studentships are funded for 3 years (subject to satisfactory annual performance and progression review) and will provide for tuition fees and a tax-free stipend paid monthly.

Please note that there are more projects than funded studentships available and therefore this is a competitive application process which will include an interview. Shortlisted candidates will be contacted for an interview in person or via Teams. After interview the most outstanding applicants will be offered a studentship.

Queries about the application process are welcome and should be emailed to pgrscholarships@hud.ac.uk.

Informal enquiries about this project should be directed to Professor Craig Rice.

**Type of Award:** Doctor of Philosophy (PhD).

**Eligibility:** UK applicants only. First Class or Upper Second-Class Honours degree or equivalent in a relevant subject area, please refer to the entry requirements on the specific projects being advertised.

**Location:** Huddersfield.

**Funding:** 3 years full time research covering tuition fees and a tax-free bursary (stipend) starting at £21,805 for 2026/27 and increasing in line with the EPSRC guidelines for the subsequent years. Funded via the Engineering and Physical Sciences Research Council Doctoral Training Programme.

**Duration:** 3 years full-time plus 12 months writing up (please note that no funding is available for the writing up period).

**Closing date:** 28th April 2026

**Start date:** 1st October 2026

**Application details**

- Go to the EPSRC webpage and download the Expression of Interest Form 2026.
- Provide copies of transcripts and certificates of all relevant academic and/or any professional qualifications.
- Provide references from two individuals – please contact your referees and ask them to send them directly to pgrscholarships@hud.ac.uk from their email address.
- Proof of eligibility – e.g. scan of passport photo page
- Completed forms, including all relevant documents should be submitted via-email to pgrscholarships@hud.ac.uk.

**Please note:** if you do not attach all the relevant documentation prior to the closing date your application will not be considered.

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