

# Innovative phage-drug nanoconjugates to combat antimicrobial resistance



THE UNIVERSITY OF  
SYDNEY

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## Medical technology



> TRL 3  
> Proof of concept

### Problem

The misuse of antibiotics has fuelled a rise in antimicrobial resistance (AMR), with resistant pathogens becoming major health threats as they develop defences that make treatments ineffective. These bacteria, often form protective biofilms, leading to persistent infections that current drugs struggle to eradicate.

This is especially problematic in healthcare settings, where pathogens like *Pseudomonas aeruginosa* contribute to a significant portion of hospital-acquired infections. The challenge is exacerbated by the slow and costly process of developing new antibiotics, which are often rapidly countered by evolving bacterial resistance. Consequently, innovative therapies effective against resistant bacteria and biofilms are critically needed.

### Solution

We have developed phage-drug nanoconjugates for combating bacterial infections, including those by resistant strains. These conjugates consist of a phage linked to active agents via a cleavable linker. Active agents can be directly or indirectly attached to the linker.

This design allows for targeted delivery and controlled release of the therapeutic agents. The phage-drug nanoconjugates leverage the specificity of phages to target and kill bacteria, as well as the efficacy of drugs to treat infections and disrupt biofilms, thus offering a novel combination of orthogonal approaches to address antimicrobial resistance.

### Intellectual Property Status

NPE AU, EP, US

WO 2023/092196

### Commercial Opportunity

This is an opportunity to acquire a novel therapeutic platform to combat bacterial infections, especially those resistant to current antibiotics.

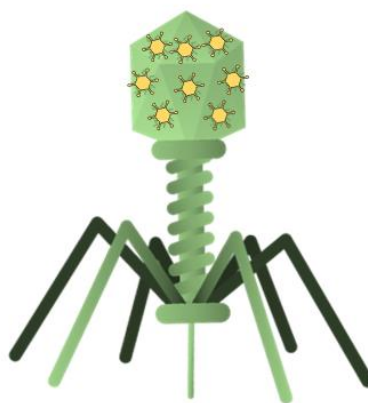
The novel linker allows various agents to be conjugated to different phages and released in a controlled manner, thus offering a distinct competitive advantage over traditional antibiotics.

### Inventors

Professor Jonathan Iredell, Dr Hien Thi Duong, Huiping Huang

### Potential Commercial Applications

Phage-drug nanoconjugates can be used for multiple applications including inhalable, oral, parenteral and wound dressing products.



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