Defence-related Research Action - DEFRA

ACRONYM: BIOTACTic

Title: Integrating novel antimicrobials & BIOfilm-targeting strategies for development of Targeted Antimicrobial Combinations & Therapies for wound infections

Duration of the project: 1/12/2025 – 1/03/2029

Key words: Antimicrobial hydrogel / wound infection control / multidrug-resistant bacteria / battlefield medicine / rapid healing solutions

Budget: € 970.000

of which RHID contribution:

€ 930.000

PROJECT DESCRIPTION

Project

In modern military operations, injuries often occur in environments where immediate medical care is difficult to provide. Wounds sustained in combat or during missions can quickly become infected, especially when evacuation is delayed or resources are scarce. This challenge is compounded by the rise of antibiotic-resistant bacteria, which makes traditional treatments less effective and increases the risk of severe complications. Infections caused by these resistant strains can lead to prolonged recovery times, reduced operational readiness, and, in the worst cases, life-threatening conditions. Addressing this issue is critical for the health and safety of Defence personnel and for maintaining mission effectiveness.

Our project proposes an innovative solution: a **bio-based wound gel** designed for rapid application in the field. This gel combines antibacterial agents with beneficial microbes to stop infections within the first hour after injury and promote faster healing. Unlike conventional antibiotics, which often fail against resistant bacteria, this approach targets multiple mechanisms to prevent infection and support tissue repair. The gel will be safe, easy to use, and effective under harsh conditions, making it suitable for frontline deployment.

The development process involves several steps. First, we identify the most effective antibacterial components that can work against a broad range of harmful bacteria, including those resistant to common antibiotics. Next, these components are integrated into a stable gel formulation that can be stored and used in challenging environments. Finally, the product will be tested in realistic wound models to ensure safety, reliability, and effectiveness. By focusing on simplicity and robustness, the solution will allow soldiers and medics to treat wounds immediately, reducing the need for complex interventions and minimizing the risk of chronic infections.

Impact for Defence

The benefits are significant: faster recovery for injured personnel, fewer complications, and improved operational readiness. By reducing reliance on traditional antibiotics, the project also contributes to global efforts to combat antimicrobial resistance—a growing threat to both military and civilian healthcare systems. This innovation will help Defence maintain a strong and healthy force, even in the most demanding conditions. Beyond Defence, the technology has strong potential for humanitarian missions and civilian healthcare, where rapid wound care can save lives in disaster zones or remote areas.

Expected Results and Future Perspectives

The project will deliver a deployable wound-care gel, practical guidelines for field use, and knowledge sharing through publications and partnerships. In the short term, the focus is on creating and testing a prototype that meets the requirements for safety and effectiveness. In the medium term, the goal is large-scale production and integration into Defence medical kits, ensuring that this solution becomes a standard tool for frontline care. Ultimately, this innovation will provide a safer, faster, and more sustainable way to treat wounds in the most demanding conditions, with applications that extend far beyond the military domain.

By combining cutting-edge science with practical design, this project addresses one of the most pressing challenges in modern healthcare: how to prevent infections when antibiotics no longer work. It represents a major step forward in protecting lives, improving recovery, and ensuring readiness for both Defence and civilian contexts.

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LINK(S)

Not available (yet).