MANCHESTER 1824
The University of Manchester

CASE STUDY

Biocomposites

Developing a novel collagen model to improve the treatment of diabetic foot ulcers

Challenge

Diabetes has major implications for public health. Diabetic foot ulcers (DFUs) affect 20% of patients, with around half of these becoming infected, which can, ultimately, lead to amputation.

Biocomposites wanted to investigate the potential use of calcium sulfate beads to release antibiotics directly into infected tissues to determine how effective this would be in clearing bacterial biofilm. However, existing in vitro models were costly and of limited relevance to human soft tissue, so were not suitable for testing in detail the performance of the Biocomposites technology.

Innovation

The University of Manchester team developed a novel collagen soft tissue wound model that uses collagen as a substrate for biofilm growth and incorporates serum to mimic the biochemical complexity of a wound environment - effectively an infected wound in a dish. The antibiotic loaded material was applied to the wound model which enabled the team to measure how far the antibiotics had penetrated the tissue, how they reacted to the simulated wound environment and their effectiveness in killing robust biofilms.

Impact

The project has increased Biocomposites' understanding of infected DFUs, and provided valuable data to show the enhanced efficacy of locally released antibiotics when combined with the right carrier material. This has provided important data to inform their ongoing product development.

The team has also been approached by other companies in the wound care sector who want to use the new soft tissue model to test movement and efficacy of antimicrobials released from medical devices.

> *"Working with the University of Manchester has provided the company with deep insight into the treatment of infected DFUs and other related conditions, as well as valuable and robust scientific data, which will benefit future commercial product development."*
>
> Sean Aiken, Clinical Research Director, Biocomposites

> *"The collaboration with Biocomposites has allowed us to apply our expertise in cell biology and microbiology to an important real world problem, and develop a new way to test a novel intervention which may have significant impact in the clinical setting."*
>
> Dr Bianca Price, University of Manchester

Biocomposites®

Company Overview

Based in Keele Science Park, Staffordshire, Biocomposites develops innovative calcium compounds to regenerate and repair bone and soft tissue. With over 25 years' experience of manipulating the surface chemistry and crystalline properties of calcium compounds, we engineer and manufacture products at the forefront of calcium technology.

Bianca Price, who led the laboratory development of the model, was named Bionow **'Promising Technologist of the Year'** awarded to the most promising young biotechnologist in the North of England.

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BIOLOGY | MEDICINE | HEALTH

Collaborate with us

Whether you're a forward-thinking international blue chip or an ambitious SME, a partnership with The University of Manchester can have a significant impact on the performance of your organisation. Our business collaborations range from projects which tap into the skills and technology we have available, to large-scale, strategic research partnerships focused on addressing important challenges in the biomedical and healthcare sciences.

Why Manchester?

At The University of Manchester, we know the value of working together. Through collaboration, our internationally renowned research has made a positive impact on society by generating jobs and wealth, creating new therapies and treatments, improving patient outcomes and influencing global public health. We are proud of our long-standing, mutually beneficially relationships with industry and have a proven track record of delivering successful projects for external organisations.

Whatever the relationship, our dedicated business engagement experts are on hand to make it easy to work with the University, putting you in direct contact with world-leading research expertise and facilities to help you achieve your objectives and face future challenges with confidence.

- **Cancer**
- **Cardiovascular, Endocrine & Metabolic Sciences**
- **Cellular & Developmental Systems**
- **Evolution, Systems & Genomics**
- **Infection, Immunity, Inflammation & Repair**
- **Neuroscience & Mental Health**
- **Platform Sciences & Technologies**
- **Population Health**

Contact us

Contact the Business Engagement Team to discuss how we can help you to innovate and build a strategy for success.

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