LXD231: A light activated treatment for reducing microbial bioburden in infected wounds

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1. Introduction

- **Infections that arise within wounds delay healing** and increase the likelihood of complications such as gangrene and amputation. Management of infected wounds is costly and time-consuming.
- Antibiotics, the tools used to fight entrenched infections arising in wounds, are becoming **increasingly ineffective due to antimicrobial resistance (AMR)**. It is crucial that we develop novel antimicrobial modalities that inhibit the establishment of resistant microbe colonies.
- LightOx are developing LXD231, a light-activated gel specifically designed to **eliminate antibiotic-resistant bacteria that arise in infected wounds**.

2. LXD231

- **LXD231 is a small molecule drug that absorbs light of 380-450 nm** (violet to blue, Figure 1A) from simple LED light devices.
- The inherent fluorescence behaviour (Figure 1B) of LXD231 enables imaging of uptake into a range of bacteria, with incorporation into Gram-positive species and localisation onto the outer membrane surface of Gram-negative species.
- LXD231 generates radical oxygen species (ROS) when activated by light of 380-450 nm. ROS is destructive to bacteria and, furthermore, **bacteria are unable to develop resistance towards it**.
- Illumination of LXD231 via LED light devices activates the drug's antimicrobial activity (Figure 1C), **causing elimination of bacteria including antibiotic-resistant strains such as MRSA**.

3. Next steps

- We are in preclinical development, currently completing gel formulation of LXD231 (Figure 2) and exemplifying activity in *ex vivo* and *in vivo* models of an infected wound.
- LightOx are looking for feedback from practitioners in the wound care sector. We are targeting clinical trials in 2026-2028.

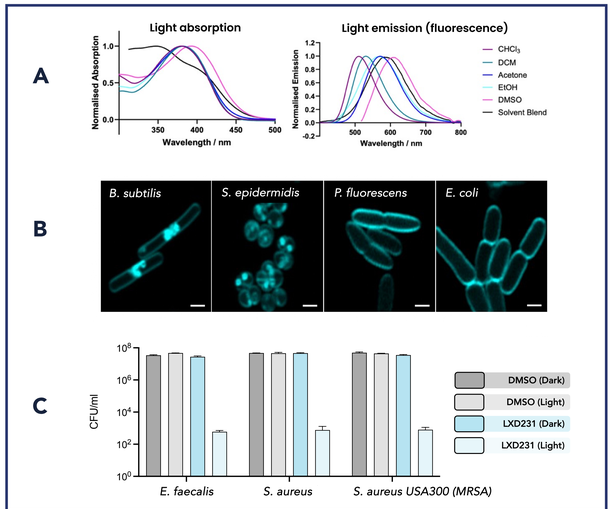

Figure 1
(A) LXD231 photophysical behaviour.
(B) Imaging localisation of LXD231 in a range of bacteria using confocal microscopy and LXD231's inherent fluorescence characteristics.
(C) Light-activated antimicrobial activity of LXD231 (2 μM) against a range of bacteria including antibiotic resistant MRSA.

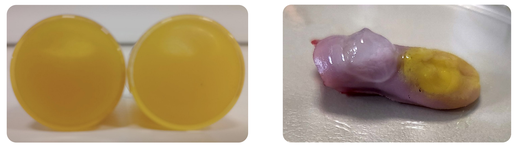

Figure 2
Development of gel formulations of LXD231 (left), enabling application to the wound surface (right).

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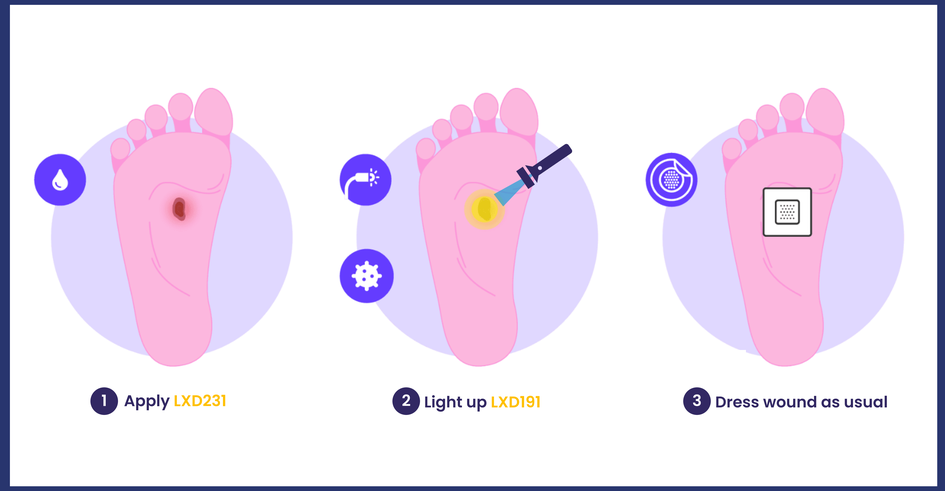
Eliminate antibiotic-resistant bacteria in infected wounds using a light activated gel treatment



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