



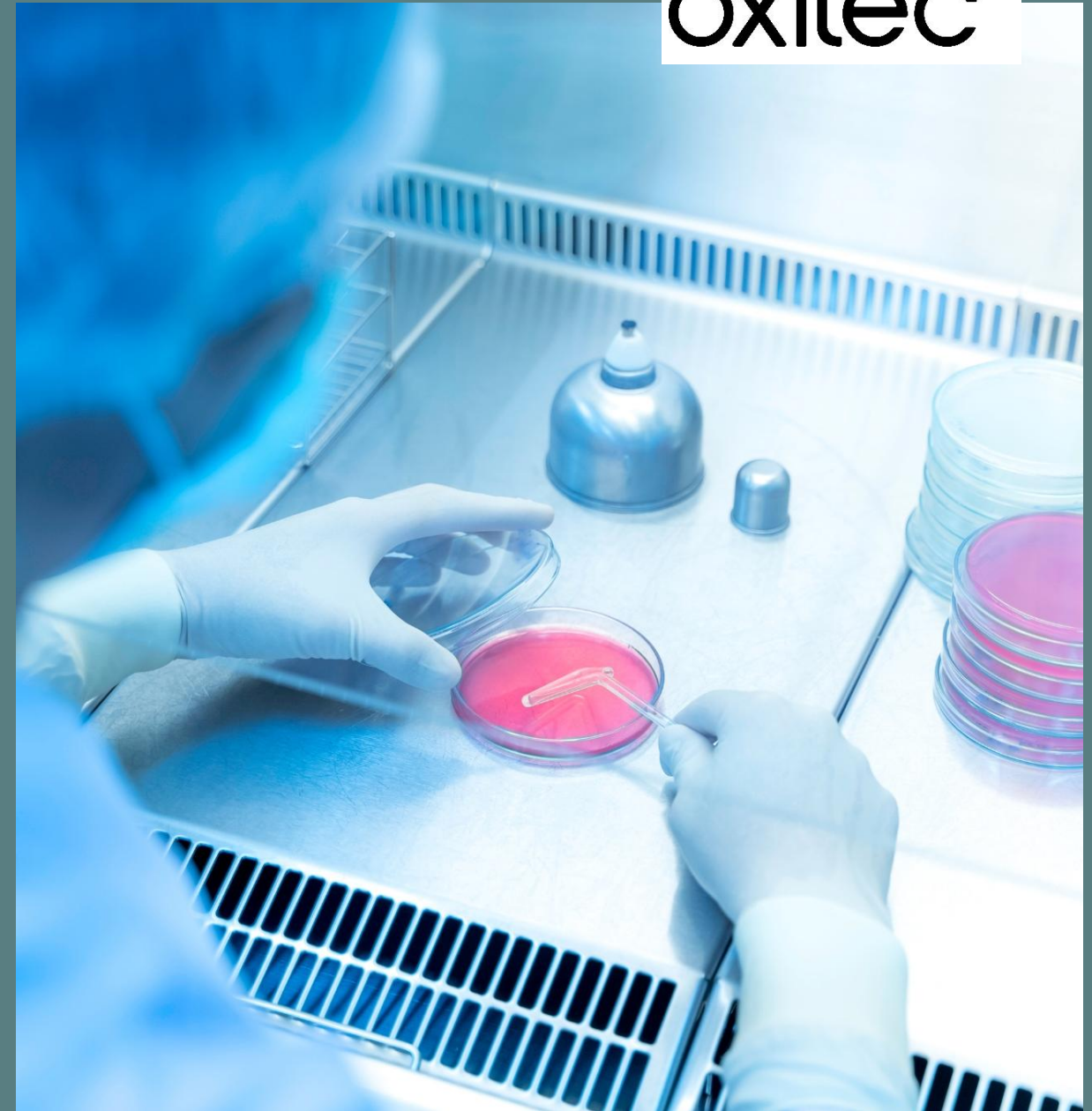
Pioneering genetic modification of Tsetse Flies: Advancing vector control through industry, academic collaboration and innovation in insect engineering



Oxitec Ltd is a global leader in insect-biotechnology, developing genetically engineered insects to suppress pest species that threaten human health and livestock welfare. Their self-limiting technology targets harmful populations, such as disease-carrying mosquitoes or livestock parasites, offering a sustainable alternative to chemical controls. By reducing vector-borne disease risks and improving animal health, Oxitec's innovations support safer communities and more resilient livestock systems.

Based at the Roslin Innovation Centre's Agritech Field Station, the company benefits from controlled-environment insect rearing rooms and molecular facilities, enabling rigorous testing, scalable colony maintenance and collaboration with the surrounding research community.

Tsetse flies are major vectors of African Animal Trypanosomiasis (AAT), a devastating livestock disease that causes severe economic losses, reduces animal productivity, and limits agricultural development across affected regions. Current control methods such as traps, pesticides, and sterile insect releases, are costly, difficult to sustain, and often only partially effective. Unlike many other insect vectors, tsetse flies are extremely difficult to genetically modify, which has prevented the development of modern, targeted, and scalable control strategies. The core challenge is to establish reliable methods for gene transfer and gene editing in tsetse flies, enabling new biological tools, improved understanding of their biology, and innovative genetic approaches for long-term vector control.





This **Campus Innovation Award (CIA)** funded a collaborative project partnership between Oxitec and the Roslin Institute to develop the first proof-of-concept methods for genetically modifying tsetse flies, an advance never before achieved in a viviparous insect. Building on the Oxitec's extensive expertise in arthropod genetic modification and Roslin's world-class tsetse fly research facility, the work generated essential early data to demonstrate the feasibility of gene transfer and gene editing in tsetse. These results provide the foundation for future germline-targeting approaches, offering a transformative avenue for controlling tsetse populations, which transmit African Animal Trypanosomiasis (AAT) and impose major burdens on livestock health and agricultural productivity.

The project delivered technical proof of concept, strengthened Oxitec's capability to work with previously intractable insect species, and expanded Roslin's role as a UK hub for vector biology research. The collaboration also generated preliminary data to support future funding applications and laid the groundwork for new genetic tools to study tsetse biology, reproduction, and vector competence.

Looking ahead, the work has strong potential to lead to new intellectual property, academic publications, and long-term commercial opportunities in livestock health. Ultimately, it opens a new frontier in sustainable vector control with far-reaching benefits for agriculture, public health, and insect biotechnology



“Our academic partnership helped explore new markets for our technology. Providing expertise, biological resources and validation that enabled us to adapt our platform for rapid diagnostic applications in human and companion-animal health. and broaden revenue streams.”

Kelly Matzen CTO of Oxitec Ltd