



excellio



Biotechnology and
Biological Sciences
Research Council



Accelerating exosome therapies through
access to advanced research facilities



Excellio Labs is an emerging biotechnology company based at the Roslin Innovation Centre, developing next-generation therapeutic delivery systems using engineered exosomes. Founded by University of Edinburgh scientists with expertise in stem-cell biology, genome engineering and cancer epigenetics, the company is building a platform for precise, target-specific exosome therapeutics, with a particular focus on cancer immunotherapies.

Working at the intersection of stem cell biology and advanced therapeutics, Excellio benefits from the Centre's supportive ecosystem, including access to specialist facilities, expert networks, and collaborative opportunities. This environment accelerates platform development and strengthens efforts to address key challenges in targeted delivery and translational scalability.

The Campus Innovation Award enabled Excellio to access advanced flow cytometry, nanoparticle tracking analysis facilities and academic expertise. These resources provided essential capabilities that would otherwise be inaccessible to an early-stage biotechnology company, accelerating technical development and strengthening in-house capability.

A major challenge in cancer therapy is achieving precise delivery of therapeutics to tumour cells while minimising toxicity to healthy tissues. Many current cancer treatments lack sufficient specificity, leading to severe side effects, dose-limiting toxicities, and high overall treatment costs. This significantly restricts their clinical effectiveness and patient quality of life.



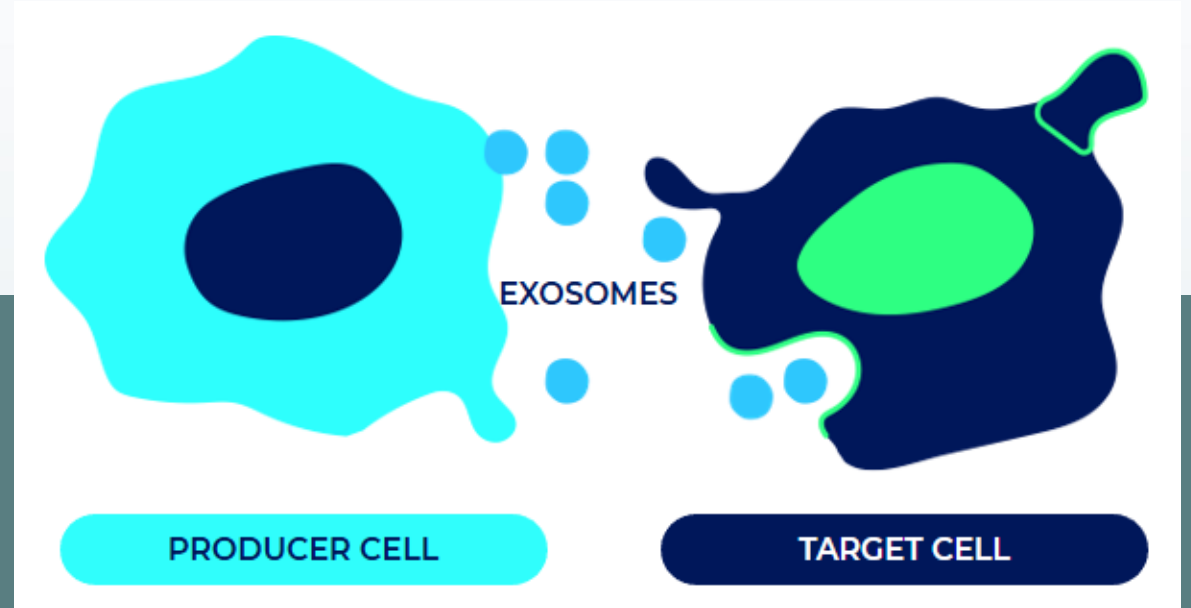


Exosomes, natural nanoscale vesicles involved in cell-to-cell communication, offer a promising solution to this challenge. In particular, immune cell derived exosomes are preferentially taken up by cancer cells, while exhibiting intrinsic cytotoxic activity against tumours and a favourable safety profile in healthy cells. Exosomes' inherent anti-cancer properties can be further augmented by loading them with small molecule drugs, nucleic acids, or proteins. Engineered exosomes will enable cancer immunotherapies that are safer, more effective, and potentially more affordable by improving the therapeutic index, reducing off target effects, and lowering the required drug dose.

The project focused on optimising Excellio's exosome production and characterisation pipeline across multiple cell types, enabling the expansion of the company's research scope to include exosomes derived from several iPSC-differentiated lineages. This work supported the development of scalable isolation and purification workflows, allowing systematic comparison of production methods and improvements in yield, purity and batch-to-batch consistency—key requirements for translational therapeutic applications.

The project also demonstrated efficient delivery of nucleic acids to recipient cells, enabling evaluation of multiple loading strategies and their impact on vesicle integrity and performance. Collectively, these outcomes underpin Excellio's exosome production technology, designed to maximise vesicle yield and purity while preserving structural and functional integrity, and to support future development of targeted exosome-based immunotherapies.

The outcomes directly supported a £500k pre-seed investment, enabled a subsequent Innovate UK grant focused on engineering exosomes with enhanced receptor-mediated targeting, and positioned Excellio for future academic and industrial collaborations. The project highlights how early-stage biotech companies can leverage specialist research infrastructure and academic expertise to accelerate development.



“The Campus Innovation Award unlocked capabilities far beyond the reach of most start-ups. Access to world-class analytical facilities and academic expertise transformed our technical progress. We believe that our work on producing and loading exosomes can make it easier to deliver medicines to the right cells. This project helped us establish a pipeline to produce high-quality exosomes that can carry therapeutic cargo. With further development, this approach could support safer and more targeted cancer therapies”

Kasia Maj, CEO & Co-founder of Excellio Labs