

16 December 2024

WEAPONISING EXOSOMES FOR BREAST CANCER TREATMENT

- **Successful Proof of Concept weaponizing exosomes for breast cancer treatment**
- **Advancing optimisation of dosing and anti-tumour activity of exosomes**
- **Future milestones are further *in vitro* data in H1CY25 and *in vivo* efficacy data in H2CY25**

INOVIQ Limited (ASX:IIQ or **INOVIQ**) is pleased to announce that it has successfully completed stage 1 of its development program for an exosome therapeutic for breast cancer. In this *in vitro* proof-of-concept (POC) study, immortalised natural killer (NK) cells were engineered to continuously produce exosomes that specifically target and kill breast cancer cells. The specific targeting was achieved by incorporating a chimeric antigen receptor (CAR) on the surface of the exosomes. This receptor recognizes and binds to a protein that is overexpressed by breast cancer cells. This innovation allows the killing activity of CAR-NK-exosomes to be directly delivered to breast cancer cells, increasing therapeutic efficacy and reducing off-target effects (to non-cancer cells).

INOVIQ's proprietary technology¹ was utilised to isolate CAR-exosomes released by immortalised NK cells. Treatment of triple-negative breast cancer (TNBC) cells, a particularly aggressive type of breast cancer, with CAR-NK-exosomes resulted in dose dependent cancer cell death (Figure 1). At the highest dose evaluated, CAR-NK-exosomes killed over 30% of breast cancer cells and showed significantly greater efficacy than exosomes isolated from NK cells as reported in other studies².

INOVIQ has established a robust production process to prepare therapeutic exosomes that target and kill breast cancer cells. The Company will now enhance the tumour killing activity of these exosomes by pre-stimulating cells with activators. Optimal dosing and tumour killing activity will then be evaluated in animal models, as a prequel to preclinical studies.

CSO Prof Gregory Rice said: "INOVIQ's team has delivered significant progress in the complex task of successfully developing a robust and reproducible CAR-exosome production process. The results obtained in this POC are impressive, comparing very favourably with previously published data. I believe that further enhancement of cancer killing activity is realistically achievable. INOVIQ has established its CAR-exosome platform and is well placed to deliver *in vivo* data on the anti-tumour efficacy of its CAR-NK-exosome breast cancer therapeutic in CY25."

CEO Dr Leearne Hinch stated: "The results of this POC study highlight the transformative potential of INOVIQ's exosome therapy to target and kill solid tumours. We are thrilled by these POC results that show the potential of our exosome program to provide a life-saving breast cancer therapeutic for patients. We will advance our exosome therapy through additional *in vitro* and *in vivo* studies next year, moving towards Investigational New Drug (IND) enabling studies and clinical trials. We are also engaging with product development and regulatory consultants to refine our manufacturing and development strategy."

Authorised by the Company Secretary, Mark Edwards.

FURTHER INFORMATION

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ABOUT INOVIQ LTD

INOVIQ Ltd (ASX:IIQ) is a biotechnology company pioneering next-generation diagnostics and therapeutics for cancer. INOVIQ has commercialised its fast, efficient and scalable EXO-NET exosome isolation technology for biomarker discovery and diagnostics development, and the hTERT test as an adjunct test for bladder cancer. The company is advancing clinical-stage diagnostics for detection and monitoring of ovarian and breast cancers, and early-stage exosome therapeutics for solid tumours. For more information on INOVIQ, visit www.inoviq.com.

ABOUT EXOSOMES AND INOVIQ’S CAR-EXOSOME THERAPEUTICS PROGRAM

Exosomes are small vesicles released by all cell types, including immune cells such as T-lymphocyte (T)-cells and Natural Killer (NK)-cells. INOVIQ’s exosome therapeutics program utilises exosomes released from CAR-T and CAR-NK cells. CAR-T and CAR-NK cells are genetically engineered immune cells that express a chimeric antigen receptor (CAR). These receptors enable CAR-T/NK cells to specifically recognize and bind to cancer cells based on surface antigens and release their cytotoxic effects.

Exosomes released by CAR-T/NK cells (CAR-exosomes) have enormous potential as cell-free therapeutics, with potential manufacturing, safety and efficacy advantages over autologous cell therapies for the treatment of solid tumours. Utilising exosome producing cells that grow indefinitely (immortalised cells) are expected to improve manufacturing efficiency and lower therapy costs.

CAR-exosomes inherit the same tumour-targeting and cytotoxic capabilities of their parent CAR-T/NK cells, specifically targeting and killing cancer cells. Additionally, exosomes can be engineered and loaded with drug cargo, such as chemotherapeutics and RNA therapeutics to target and deliver effective treatments direct to target cells.

FIGURE 1

CAR-NK-Exosomes kill breast cancer cells

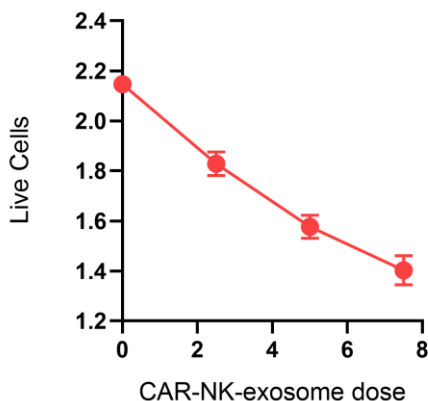


Figure 1: The effect of CAR-NK-exosomes on breast cancer cells (Hs 578T cells) grown in cell culture. CAR-NK-exosomes killed cancer cells in a dose-dependent manner (p < 0.002, ANOVA). Data presented represent the mean ± SE. Dose is number of exosomes/cell x 10⁵. Live cells are represented as absorbance units in a cell death assay.

¹ EXO-ACE™ – a scalable column-based technology for isolating exosomes for therapeutic use.
² Kim et al., 2023 Functional enhancement of exosomes derived from NK cells by IL-15 and IL-21 synergy against hepatocellular carcinoma cells: The cytotoxicity and apoptosis in vitro study. doi: [10.1016/j.heliyon.2023.e16962](https://doi.org/10.1016/j.heliyon.2023.e16962)