Creation and potentiation of a lipid-armored ovarian cancer vaccine

Project Description

Project duration:	Honours project; ~9 months
Description:	Are you passionate about cancer research and eager to make a significant impact in the field of immunotherapy? Join our team for a unique Honours project focused on enhancing the stimulatory properties of human Type I Dendritic Cells (cDC1s) using advanced mRNA electroporation techniques to combat ovarian cancer. This project offers you the opportunity to: • **Explore Advanced mRNA Technology:** Learn and apply state-of-the-art mRNA modifications to increase immunogenicity and improve dendritic cell functionality. • **Hands-On Laboratory Experience:** Gain proficiency in electroporation, cell culture, T cell assays, flow cytometry and immune cell manipulation, essential skills for a career in biomedical research. • **Impactful Research:** Contribute to groundbreaking studies aimed at enhancing the immune response against ovarian cancer, potentially leading to new therapeutic strategies. • **Collaborative Environment:** Work alongside experienced researchers and clinicians in a supportive, interdisciplinary team at the forefront of cancer immunotherapy. Join us in this transformative project where your research could pave the way for novel cancer treatments.
Expected outcomes and deliverables:	With help from the Cancer Immunotherapies Team, you will: 1. Expand human cDC1 from ovarian cancer samples and umbilical cord blood 2. Optimize a protocol for the electroporation of nucleic acids and tumor cell lysate in human cDC1 3. Electroporate DC1 with tumor cell lysate and messenger RNA (mRNA) encoding gene/s which confer resistance to enriched lipids within the ovarian cancer microenvironment. Alternately, utilize CRISPR/Cas9 to knockout genes which confer immunosuppressive functions to DC1 after lipid contact. 4. Evaluate the ability of modified cDC1 to stimulate T cells *in vitro;* utilize multiple measures of T cell functionality including intracellular cytokine staining and killing assays.
Suitable for:	Students with an interest in cancer immunotherapy research and undergraduate courses completed to a high standard in immunology, cell & molecular biology, microbiology and biochemistry subjects are encouraged to apply. Students with a Bachelor of Science, Bachelor of Biomedical Science, Bachelor of Biotechnology or related degree are welcome. Experience in a research environment is desired but not essential. Ideal candidates are dedicated, detail-oriented, and have a strong background in molecular biology or immunology.
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