UQ Summer Research Project Description - 2026

Project title:	**Translational genomics research to develop a new diagnostic test on exhaled breath condensates for lung disease**
Hours of engagement & delivery mode	Hours of engagement: 36 hrs per week for 6 weeks between 12 January and 20 February 2026. Location: UQ Northside Clinical Unit, The Prince Charles Hospital
Description:	A leading candidate for non-invasive lung cancer screening is exhaled breath condensate (EBC), a favoured method of sampling exhaled breath, and a promising target for biomarkers of early-stage non-invasive disease detection. EBC collections involve performing breathing manoeuvres through a cooled apparatus inside which the breath condenses into a liquid which can be readily collected, stored and analysed. In recent years extracellular vesicles found in breath (bEVs) have gained interest in as a viable source of biomarkers in exhaled breath with potential clinical application in disease detection. This project aims to isolate and characterise bEVs and extract nucleic acid cargo and performed next-generation sequencing to evaluate differences between lung cancer patients with absent and heavy smoking histories and healthy controls. bEVs will be isolated from EBC samples by ultracentrifugation, and DNA, RNA and miRNA will be extracted from bEVS for downstream quality assessment to prepare for small RNA sequencing.
Expected learning outcomes and deliverables:	The student will gain experience in handling human biological samples and learn standard and specialised lab techniques. It will be expected that a more refined protocol will be developed with supervisor support. Further, bEVs would have been isolated and RNA extracted and quality checked. This could contribute to a publication or conference abstracts.
Suitable for:	Biomedical student or pre-medical provisional students with some laboratory based skills.
Primary Supervisor:	Prof Ian Yang ian.yang@health.qld.gov.au
Further info:	The supervisor CAN be contacted by students prior to submission of an application. This project requires evidence of vaccination or non-susceptibility for vaccine preventable diseases: Hepatitis B.