# Targeting PC4 with PROTACs to Eliminate Metastatic Triple-Negative Breast Cancer

## Project Description

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| Project duration: | Honours, PhD or MPhil |
| Description: | Metastasis accounts for over 90% of cancer-related deaths, with triple-negative breast cancer (TNBC) among the most aggressive and metastatic subtypes. Current treatments often fail to eliminate metastatic cells. This project investigates *Positive Cofactor 4 (PC4)*—a transcriptional regulator overexpressed in TNBC and strongly associated with poor prognosis—as a novel therapeutic target. The team has developed a *PC4-targeting PROTAC* (Proteolysis Targeting Chimera) designed to degrade PC4, disrupt pro-metastatic signalling (notably TGF-β/SMAD2/3), and selectively kill metastatic cancer cells. This project aims to map PC4-driven pathways, optimise the PROTAC compound, and validate its safety and efficacy in advanced models. The work has potential to yield a first-in-class drug for TNBC and other PC4-driven cancers. |
| Expected outcomes and deliverables: | Students will:<br>Learn advanced techniques including molecular cloning, proteomics, ChIP-seq, cell-based assays, and in vivo metastasis modelling<br>Develop skills in drug design, cancer signalling analysis, and therapeutic validation<br>Contribute to PROTAC development and optimisation for tumour-specific targeting<br>Be expected to complete a thesis and present their findings; high-performing students may contribute to conference presentations and publications |
| Suitable for: | This project is suited to motivated students with a background or strong interest in cancer biology, molecular biology, medicinal chemistry, or biotechnology. Prior experience with cell culture, molecular techniques, or drug screening is advantageous but not essential. Ideal candidates will be curious, detail-oriented, and excited by translational cancer research. |
| Primary Supervisor: | Dr Murugan Kalimutho and Professor Kum Kum Khanna |
| Further info: | Interested applicants are encouraged to contact the research team prior to applying:<br>e: Murugan.kalimutho@mater.uq.edu.au |