

Funding: [Professor Mat Simpson](#), School of Mathematical Sciences, QUT.

Applications: e-mail to register your interest: matthew.simpson@qut.edu.au

Project Title: Mathematical and statistical modelling of cell migration in 4D tumour spheroids

Project Description: My [research group](#) is recruiting up to 2 PhD students who will work on a project funded by the Australian Research Council. The project will involve collaboration with [Professor Nikolas Haass](#) at the University of Queensland and the [Translational Research Institute](#). The projects will commence in 2020 or 2021.

Mathematical models have a long, successful history of providing biological insight, and new mathematical models must be developed to keep pace with emerging technologies. Modern

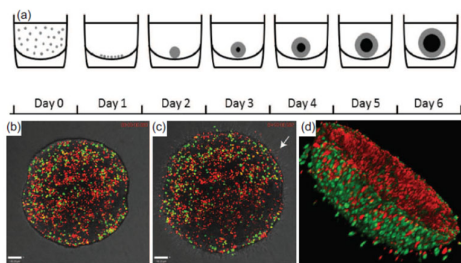


Figure 1: 4D spheroids showing spheroid generation (top) and imaging (bottom)

experimental procedures involve studying 3D multicellular spheroids with fluorescent labels to show both the location of cells and the cell cycle progression. This 4D data (3D spatial information + cell cycle time) provides vast information (Figure 1).

No mathematical models have been specifically developed to interpret/predict 4D spheroids. This project will deliver the first high-fidelity mathematical models to interpret/predict 4D spheroid experiments in real time, providing quantitative insight into innate mechanisms and responses to various drug treatments.

The PhD students will be based in the [School of Mathematical Sciences](#) at QUT as a part of my [research group](#). The research projects are can be broadly defined to suit the interest of the student. The project would involve some combination of computational modelling, statistical inference, high-performance computing, data science and even some experimental science if the candidate is keen to learn how to culture cells in the laboratory.

Applications: Applicants should hold, or will soon hold, a first-class Honours degree or Master of Philosophy degree in applied mathematics, physics, engineering or a related discipline. Experience in programming (e.g. C++, MATLAB, Python, R) is helpful.

The applicant must be eligible to enrol in a PhD at [QUT](#). The stipend (AU\$28,092 in 2020) is tax exempt for full-time students and will support living costs for up to 3.5 years. International students will receive an accompanying QUT Higher Degree Research Tuition Fee Sponsorship.