Project Title	Mechanistically inspired non-linear mixed effects models of invasive fungal infections
Supervisor	Dr Reiko Tanaka
Theme(s)	Computational and theoretical modelling
Project Type	Desk Based
Project Description	Mathematical models of disease pathogenesis are powerful tools to investigate the fundamental mechanisms behind disease development and progression. We define the structure of a model based on biological/clinical literature, and then conduct model parameter fitting, which requires experimental data from the literature, to further back up our model.
	Our group has been developing a mathematical model of critical fungal infections and have already tried model fitting by pooling together the available experimental data from the fungal community. However, the data collected are often originated from different experimental labs, each of which may follow its own experimental protocol and the previously taken fitting process did not take these inter-lab experimental differences into account.
	The aim of this project is to perform parameter fitting of our fungal infection model but take the inter-lab experimental differences into consideration. The student is expected to do so by implementing a mixed-effects model using available software such as NLMEModelling in Mathematica. The student should then quantify the added benefit of modelling individual experiments as opposed to pooling the data.