

<b>Project Title</b>	Mathematical modelling of filamentous fungal growth in vivo
<b>Supervisor</b>	Dr Reiko Tanaka
<b>Theme(s)</b>	Computational and theoretical modelling
<b>Project Type</b>	Desk Based
<b>Project Description</b>	<p>Invasive fungal infections are often critical in vulnerable patients, such as immunocompromised patients. Quantifying the extent of fungal growth in murine infections models during infection remains a difficult task.</p> <p>Currently, qPCR methods form accurate estimates of total fungal burden but cannot capture viability, while CFU counts can capture viability but are inaccurate measures of fungal burden. The community currently relies on using a mix of these measures to quantify fungal burden during disease resulting in contrasting quantifications of fungal burden. There remains a real need to understand the viable fungal burden count during disease progression, without which, we cannot accurately assess the effect of anti-fungal therapeutics in the mouse. This project aims to model the latent viable fungal burden count in vivo using the observed qPCR total fungal burden and inaccurate viability data (in CFUs).</p> <p>The student is expected to propose several mathematical models of <i>Aspergillus fumigatus</i> growth in vivo and compare them using state-of-the-art model selection tools. Model development and comparison will be based on various different forms of <i>Aspergillus</i> growth data in vivo obtained by our collaborators (Ms Natasha Motsi).</p>