

## James Locke

### Abstract :

Our lab is focused on developing a quantitative understanding of signal integration and gene circuit dynamics at the single cell level. It is critical to observe cellular behaviour at the single cell level as traditional approaches that take an average from a population can obscure heterogeneous responses and novel dynamics. We combine mathematical modelling and timelapse microscopy to examine gene circuit dynamics in a variety of model organisms including *B. subtilis*, Cyanobacteria and *Arabidopsis*. We are attempting to understand how gene regulatory dynamics are generated, how dynamic gene regulatory pathways are coupled together, and what role cellular noise can play in development.