

## **Developmental specificity of subcellular dynamic responses to *Colletotrichum higginsianum* infection of *Arabidopsis thaliana*.**

### **Supervisory team:**

**Lead supervisors:** Dr Imogen Sparkes (University of Bristol) and Dr George Littlejohn (University of Plymouth)  
Dr Jim Fouracre (University of Bristol), Dr Anne Plessis (University of Plymouth)

**Collaborators:** Prof Mark Fricker (Oxford University), Dr Christine Faulkner (John Innes Centre), Prof Stan Botchway (Rutherford Appleton laboratories), Dr Andy Ward (Rutherford Appleton laboratories)

**Host institution:** University of Bristol / University of Plymouth

***Submit applications for this project to University of Bristol***

### **Project description:**

Pathogens are responsible for reducing global crop yields of major crops by around 20% annually. Fungal pathogens of the *Colletotrichum* species complexes are the causative agents of anthracnose in several crop species including orchard fruits, coffee and chili and have been responsible for 95% losses in individual Colombian coffee plantations. During the infection process phytopathogens alter positioning and movement of organelles including the nucleus and chloroplasts. For example, changes in chloroplast morphology and position are currently being investigated in the rice - *Magnaporthe oryzae* pathosystem in Dr Littlejohn's research group. In addition, host susceptibility to pathogens is related to leaf developmental stage. Here, we will assess how *Colletotrichum higginsianum* affects organelle dynamics and whether we can alter susceptibility to the pathogen by introducing genetic tools which control organelle movement. We will observe subcellular dynamics in juvenile and mature leaves and assess whether there is a relationship between infection rate, leaf age and changes in organelle movement. Work will be carried out in the model organism *Arabidopsis*. Dr Sparkes' group focuses on molecular mechanisms underpinning organelle movement including myosins and membrane contract sites. Dr Littlejohn's group has expertise in plant-pathogen interactions. Dr Fouracre is an expert in plant development. Dr Plessis has expertise in complex quantitative analysis of plants. The student will be registered at Bristol University where they will initially be based before moving to Plymouth University to carry out pathogen studies. They will be trained in plant cell biology, confocal microscopy, plant pathology and plant developmental biology.

**Our aim as the SWBio DTP is to support students from a range of backgrounds and circumstances. Where needed, we will work with you to take into consideration reasonable project adaptations (for example to support caring responsibilities, disabilities, other significant personal circumstances) as well as flexible working and part-time study requests, to enable greater access to a PhD. All our supervisors support us with this aim, so please feel comfortable in discussing further with the listed PhD project supervisor to see what is feasible.**