

Post-doctoral position

Department of Biochemistry, Genetics and Microbiology at the University of Pretoria.

**Utilisation of the *Phytophthora cinnamomi*-tobacco pathosystem for functional characterisation of avocado defense genes**

Genomic and transcriptomic data have enabled us to identify genes which may play a crucial role in avocado defense against *Phytophthora cinnamomi*. The expression profile of a candidate gene during *P. cinnamomi* infection, combined with the *in silico* characterisation of the encoded protein, merely allows us to hypothesise about the biological role of the protein in avocado defence. Functional characterisation within the avocado - *P. cinnamomi* pathosystem is becoming increasingly important to functionally characterise the role of candidate proteins during infection. However, avocado is recalcitrant to genetic transformation, which makes functional characterisation exceptionally challenging. Two recent studies have demonstrated the feasibility of *Agrobacteria*-mediated transformation of avocado, however the process takes several months from the initial transformation experiment to where avocado explants can be functionally assessed. A *Nicotiana benthamiana* – *P. cinnamomi* pathosystem has been developed which can be utilised for preliminary functional studies. *Nicotiana benthamiana* is a model plant species susceptible to many plant pathogens, that is easily transformed using agro-infiltration. Considering the short-life cycle of *N. benthamiana*, this pathosystem allows for relatively fast assessment of candidate defence genes during *P. cinnamomi* infection, prior to undertaking avocado transformation experiments.

Requirements:

- An appropriate degree – PhD in Biotechnology/Genetics/Microbiology
- Good knowledge of plant molecular biology
- Ability to work independently and trouble shoot
- Supervise Masters and PhD students
- Project proposal and manuscript writing skills
- Good presentation/communication skills
- Demonstrated experience in functional characterization studies
  - Vector construction – modular constructs for gene overexpression/knockdown/knockout
  - Plant/Pathogen transformation – transient and stable
  - Southern, qPCR analysis
  - Protein techniques such as: Protein isolation and purification, *in vitro* and *in vivo* protein-protein interaction assays
  - Plant tissue culture

**How to apply:**

Applications should be sent to Prof Noëlan van den Berg ([noelani.vandenberg@up.ac.za](mailto:noelani.vandenberg@up.ac.za)), by **28 February 2021**.

**Applications should include:**

- A comprehensive curriculum vitae;
- Certified copies of qualifications;
- A cover letter providing reasons for your interest in the project; self-evaluation of research career to date with specific focus on molecular expertise;
- The names, email addresses and telephone contact details of three academic referees who can attest to your academic and research profile.

