

Fully-funded PhD position 2027 – 2029**Prediction and functional characterisation of the pathogenicity genes of
*Dematophora necatrix***

Dematophora necatrix is an aggressive fungal pathogen and the causal agent of white root rot (WRR) in avocado. Since its emergence in South Africa in 2016, WRR has become a growing threat to local avocado orchards as no resistant avocado rootstocks are commercially available. Despite advances in fungal genomics, the molecular basis of *D. necatrix* pathogenicity remains poorly understood. There is a pressing need to identify and functionally characterise the key pathogenicity genes that enable infection and disease progression in avocado roots.

Research activities:

- Bioinformatic analysis of all the available *D. necatrix* genomes and transcriptomes to predict and identify genes related to pathogenicity.
- Expression analysis of selected pathogenicity genes using existing *in planta* transcriptomic data to verify their role in plant infection and disease development.
- Disruption of candidate genes in *D. necatrix* using a developed CRISPR-Cas9 system.
- Molecular confirmation of targeted disruption of candidate genes and *in vitro* growth assessment of mutants.
- Avocado pathogenicity trial to assess the effect of the gene-disruption on virulence of mutant *D. necatrix* isolates.

Requirements:

- MSc in Genetics/Microbiology/Biotechnology or a closely related discipline, achieved with an above-average grade.
- Students must register for full-time study at the University of Pretoria in 2027 and will be based full-time at the Hatfield campus.

Bursary:

Competitive PhD bursary funded by the Hans Merensky Legacy Foundation.

HOW TO APPLY:

Applications can be sent to Prof. Noëlani van den Berg (noelani.vandenberg@up.ac.za) and must include:

1. A comprehensive curriculum vitae;
2. Certified copies of qualifications and academic records;
3. A cover letter providing reasons for your interest in the project;
4. The names and contact details of two academic referees.

CLOSING DATE: 31 OCTOBER 2026

