

PhD position to investigate plant resistance to DNA viruses

For application please check: <https://www.kuleuven.be/personeel/jobsite/jobs/60012960>

WORKING ENVIRONMENT

About the Tropical Crop Improvement Lab

The Tropical Crop Improvement Laboratory implements trait improvement approaches for important tropical crops such as banana and cassava. The Tropical Crop Improvement Laboratory has a strong focus on molecular biology, genetics and omics approaches to investigate crop responses to biotic and abiotic stresses.

The Tropical Crop Improvement Laboratory works in close collaboration with the team of The Alliance - Bioversity International (located in the same building) managing the International Musa Germplasm Transit Centre (ITC), which is home to the world's largest collection of banana germplasm. The laboratory has a strong expertise in cassava and banana research.

[Tropical Crop Improvement website](#)

About the Division of Crop Biotechnics

The Division of Crop Biotechnics performs cutting-edge research on crop and model plant species, integrating knowledge at the cellular, tissue, plant, environment and agro-systems level. The Division consists of several research groups developing various molecular tools and having a strong expertise in molecular biology, plant pathology, tropical crops, genomics, plant hormones, plant nutrition and soil. The Division of Crop Biotechnics provides a very international working environment with opportunities to collaborate with top-ranked universities and international research centers.

[Division website](#)

About KU Leuven

KU Leuven offers a competitive and international working environment with access to cutting-edge technologies and expertise. KU Leuven is the best internationally ranked university in Belgium and ranks amongst the best European universities for research and education. KU Leuven also ranks as the [most innovative university](#) in Europe, building on a very strong tech transfer office.

[KU Leuven website](#)

PhD RESEARCH PROJECT

Plant DNA viruses, including Geminiviridae and Nanoviridae, are pathogens of economic and food security importance because they are the causal agent of viral diseases in several staple crops. A few genes conferring various resistance levels against geminiviruses, some being dominant or partially dominant, have been used in Solanaceae breeding programmes. Progress in genome sequencing and assembly is providing new opportunities to identify resistance genes in plant species whose susceptibility to DNA viruses represents a major constraint to production. The PhD project aims at using three plant – DNA virus pathosystems (Cassava – African cassava mosaic virus, Banana – Banana bunchy top virus and Arabidopsis – Cabbage leaf curl virus) to investigate uncharacterized resistance genes. The laboratory has a long and proven expertise in studying tropical pathosystems (*Vanderschuren et al., 2007, Plant Biotechnology Journal; Anjanappa et al., 2016, MPMI; Anjanappa et al., 2018, Molecular Plant Pathology; Mehta et al., 2019, NAR; Mehta et al., 2019, Genome Biology; Zorrilla-Fontanesi et al. 2020, Nature Food*).

The project will take advantage of recently assembled genomes, identified virus resistance loci as well as segregating populations for virus resistance (developed in collaboration with partner institutions in Africa) in order to identify and characterize genes associated with virus

tolerance/resistance. The PhD candidate will also take advantage of our recent technological development for the profiling of full viral genomes (*Mehta et al. 2019, NAR; Mehta et al. 2020, Nature Protocols*) to further characterize natural virus resistance in selected crop pathosystems.

The laboratory has developed several tools to investigate natural virus resistance and perform validation studies using transient and transgenic assays (*Bull et al. 2009, Nature Protocols; Zainuddin et al. 2012, Plant Methods; Lentz et al. 2018, Plant Methods; Zorrilla-Fontanesi et al. 2020, Nature Food*) and genome editing tools have also been established for cassava and banana (*Bull et al. 2018, Science Advances; Zorrilla-Fontanesi et al. 2020, Nature Food*).

The following tasks are planned:

- Profiling of virus populations in crop genotypes contrasting for virus resistance
- Identification and characterization of genome-wide significant loci
- Bioinformatics analysis of virus resistance loci
- Validation of candidate gene(s) by transient assays and stable transformants

The research project will also build on a strong international collaboration network including CGIAR research centers (IITA, Alliance) for access to genetic resources.

PROFILE

We seek a candidate with a degree in Biology, Bioinformatics, Biotechnology, Bioengineering or other relevant degree for the abovementioned tasks. The successful candidate should have a demonstrated experience in bioinformatics and molecular biology.

The successful candidate will have the following profile:

- creative with a strong interest in fundamental and applied research
- good academic performance at the MSc and BSc levels
- demonstrated capacity to write (scientific writing) and communicate in English
- eager to learn new techniques
- able to integrate in an international working environment

Important: candidates interested in this position must also be eligible to apply for FWO PhD fellowships (<https://www.fwo.be/en/fellowships-funding/phd-fellowships/>).

OFFER

- We offer a full-time PhD position for 4 years.
- Excellent guidance by a dynamic multidisciplinary team.
- State of the art research infrastructure.
- A challenging job in a young, dynamic and international environment.
- High level scientific training at a top-ranked university.
- Being part of a world-class research group.
- Remuneration according to the KU Leuven salary scales (<https://www.kuleuven.be/personeel/jobsite/en/phd-info>).

APPLICATION

For more information please contact Prof. Hervé Vanderschuren
herve.vanderschuren@kuleuven.be

The position will remain open until suitable candidate is identified. Candidates are expected to start on September 1st, 2021. You can apply via the [online application tool](#)

KU Leuven seeks to foster an environment where all talents can flourish, regardless of gender, age, cultural background, nationality or impairments. If you have any questions relating to accessibility or support, please contact us at diversiteit.HR@kuleuven.be.