

EDUARD VENTER

QUALIFICATION

BSc BSc (Hons) (University of the Orange Free State)

MSc PhD (University of Pretoria)

ACADEMIC AND PROFESSIONAL EXPERIENCE

I completed a PhD in Genetics at the University of Pretoria studying the interaction between pine trees and the Pitch canker pathogen. After completion of this degree I joined Paul Birch's Plant Pathology research group at the Scottish Crop Research Institute in Dundee as a Post Doctoral Researcher. The focus of my studies was on potato and its interaction with the late blight oomycete *Phytophthora infestans*. Since my return to South Africa I've been employed by the University of Johannesburg as a senior lecturer in Plant Biotechnology. I am also heading a molecular plant-pathogen research group that studies the interactions between cereals and fungal pathogens as well as insect pests.

COURSES

BOT3A10 Plant Biotechnology

BOT0047 Plant Biotechnology

RESEARCH

When plants are challenged by pathogens or pests they respond with a defence response that will enable them to defeat the pathogen/pest. This is known as a resistance response. When this response fail and the plant's defences are overcome and it results in a susceptible phenotype. During both these responses the plant will experience a response in gene regulation. This is detected at the mRNA level before protein synthesis takes place. My research programme focuses on studying the interaction between cereals and pathogens or pests. This is accomplished by studying gene regulation that takes place during the infection or infestation stages of the interaction. We are utilising genomics to isolate these genes and study their regulation and effects further. It is also possible to prime the plant's general

defence response by stimulating the Induced Systemic Response (ISR). We are studying the ISR and how that can be utilised to extend the field usage of resistant and susceptible cultivars. The last focus of the research programme is to identify the role that small non-coding RNA (ncRNA) play during defence responses in cereal plants. The research is accomplished under two interactions and divided into three parts. The first is focussed on the interaction between barley and *Fusarium graminearum*; the second focuses on the induction of the ISR in wheat before infestation by the Russian wheat aphid (RWA); and the last focuses on the role that ncRNA play during both the above mentioned interactions. By understanding how the plant host reacts to attack, strategies can be devised to enhance the resistance of plants through classical plant breeding programmes or through genetic engineering approaches.

Publications

Du Preez F, Myburg AA, **Venter, E**, Botha AM. **2008**. Resistance genes in plants and the dynamics of divergence before duplication. *South African Journal of Botany* 74: 51-64.

Gilroy EM, Hein I, Van der Hoorn R, Boevink PC, **Venter E**, McLellan H, Kafarnik F, Hrubikova K, Shaw J, Holeva M, Loake GJ, Lacomme C, Birch PRJ. **2007**. Involvement of cathepsin B in the plant disease resistance hypersensitive response. *The Plant Journal* 52:1-13.

Avrova AO, Whisson SC, Pritchard L, **Venter E**, De Luca S, Hein I, Birch PRJ. **2007**. A novel, non-protein coding infection-specific gene family is clustered throughout the genome of *Phytophthora infestans*. *Microbiology-SGM* 153:747-759.

Botha A-M, Lacock L, Van Niekerk C, Matsioloko MT, Du Preez FB, Loots S, **Venter E**, Kunert KJ, Cullis CA. 2006. Is photosynthetic transcriptional regulation in *Triticum aestivum* L. cv. 'TugelaDN' a contributing factor for tolerance to *Diuraphis noxia* (Homoptera: Aphididae)? *Plant Cell Reports*. 25: 41-54.

Armstrong MR, Whisson SC, Pritchard L, Bos JIB, **Venter E**, Avrova AO, Rehmany AP, Böhme U, Brooks K, Cherevach I, Hamlin N, White B, Fraser A, Lord A, Quail MA, Churcher C, Hall N, Berriman M, Huang S, Kamoun S, Beynon JL, Birch PRJ. **2005**. An

ancestral Oomycete locus contains late blight avirulence gene Avr3a, encoding a protein that is recognised in the host cytoplasm. *Proceedings of the National Academy of Science, USA* 21: 7766-7771.

Botha A-M, **Venter E**, Van der Vyver C, Kunert KJ. **2004**. Development and application of molecular markers in Africa: a South African view. *South African Journal of Botany* 70: 152-166.

Avrova AO, **Venter E**, Birch PRJ, Whisson SC. **2003**. Profiling and quantifying differential gene transcription in *Phytophthora infestans* prior to and during the early stages of potato infection. *Fungal Genetics and Biology* 40: 4-14.

Birch PRJ, Avrova AO, Armstrong MR, **Venter E**, Taleb N, Gilroy EM, Phillips MS, Whisson SC. **2003**. The potato-*Phytophthora infestans* interaction transcriptome. *Canadian Journal of Plant Pathology* 25: 226-231.

Whisson SC, Avrova AO, Armstrong MR, **Venter E**, Birch PRJ. **2003**. Potato late blight in the 21st century: New tools for an old problem. *Recent Research in Developmental Microbiology* 7: 439-451.

Botha A-M, **Venter E**. **2000**. Molecular marker technology linked to pest and pathogen resistance in wheat breeding. *South African Journal of Science* 96:233-240.

Venter E, Botha A-M. **2000**. Development of markers linked to *Diuraphis noxia* resistance in wheat using a novel PCR-RFLP approach. *Theoretical and Applied Genetics* 100:965-970.

Venter E, Myburg AA, Botha A-M. **1998**. Characterisation of sequences linked to Russian wheat aphid resistance genes *Dn1*, *Dn2* and *Dn5*. Proceedings of the 9th International Wheat Genetics Symposium, Saskatoon, Canada.