

## Two Career Fellowship posts in fungal pathogen - root interactions

As global food demands increase and the land available for agricultural production remains at best static, intensification of our staple food crops is inevitable. Maintenance of a healthy and fully functional root system is required to ensure this enhanced crop productivity remains environmentally sustainably and the maximum positive effects are routinely achieved when external inputs such as fertilisers and pesticides are applied to the crop.

Globally, wheat is the 4<sup>th</sup> most important agricultural crop. Locally, different environmental conditions produce different biotic and abiotic stresses which may severely limit crop productivity in some years. Globally however, the soil-inhabiting and root attacking fungal pathogen *Gaeumannomyces graminis* var. *tritici*, which causes take-all disease, remains the No1 threat to wheat production in all agricultural systems where consecutive cereal crops are grown. As cereal/wheat crop intensification increases and the climate warms then the prediction is that this threat from take-all disease will become even greater.

At the UK government funded institute Rothamsted Research, located near London in England, we have recently made two major breakthroughs whilst investigating the take-all fungus - wheat root interaction using a range of wheat germplasm (see [www.WGIN.org.uk](http://www.WGIN.org.uk), objective 10). We now wish to appoint two new research fellows to establish their own research groups to take forward these findings on the following inter-related topics:

- a) The molecular, genetic and biochemical basis of root resistance to take-all within the Triticeae.
- b) Defining the molecular/biochemical basis of the interaction occurring in the wheat root – rhizosphere which limits take-all inoculum build-up in soil in a 1<sup>st</sup> wheat crop situation.

Both selected candidates will be expected to apply for their own fellowship funds to support their own salary and that of an initial small research team for 5 years. They should therefore already have an excellent academic track record, have demonstrated their ability to undertake creative and innovative research, and should have completed their PhD studies within the past 4 years. In order to establish a multidisciplinary approach to their research, the ideal candidates should be well versed in several of the following including molecular biology, biochemistry, genetics, various 'omics approaches, microbiology, cell biology and bioinformatics. Previous experience in investigating either a specific plant pathogen-root interactions or a crop plant species is not essential.

Rothamsted Research has over 90 years experience in take-all research. In addition, over the past 8 years the wheat pathogenomic programme has been established which focuses exclusively on the UK's most important non-biotrophic pathogenic fungal interactions and soil-borne virus interactions. Full details on this research and recent achievements are available at <http://www.rothamsted.bbsrc.ac.uk/ppi/wptop.html>.

Specific to the needs of these two fellowship projects, we have state of the art glasshouse, growth room and laboratory facilities, recently completed purpose built containment facilities to investigate transgenic plant and transgenic micro-organisms generated via either stable transgenesis or by the virus induced gene silencing technology, as well as the BBSRC national capabilities in both bioimaging, and metabolomics, and a research farm. Once appointed the fellows will be expected to develop further their own research groups by applying for external UK and EU grants and through devising appropriate PhD student and under-graduate summer student projects. These activities will either be done alone or in partnership with collaborators at Rothamsted or with other academic / industry based groups. Neither post has any formal teaching duties.

The appointed fellows will join the wheat pathogenomics team and will become members of the Department of Plant Pathology and Microbiology.

Informal enquiries about these career enhancing fellowship opportunities can be made by contacting any of the following in the 1<sup>st</sup> instance:

Professor Kim Hammond-Kosack (Head of Wheat Pathogenomics and Lead for the Fusarium research, with major interests in molecular genetics and bioinformatics) ([kim.hammond-kosack@bbsrc.ac.uk](mailto:kim.hammond-kosack@bbsrc.ac.uk))

Professor John Lucas (Head of the PPM Department, with major interests in fungicide research and eyespot disease) ([john.lucas@bbsrc.ac.uk](mailto:john.lucas@bbsrc.ac.uk))

Dr Jason Rudd (Lead for *Mycosphaerella graminicola* research with a major interest in biochemistry) ([jason.rudd@bbsrc.ac.uk](mailto:jason.rudd@bbsrc.ac.uk))

Dr Kostya Kanyuka (Lead for soil borne virus research and with major interests in genetics and developing the Virus Induced Gene Silencing Technology for wheat) ([kostya.kanyuka@bbsrc.ac.uk](mailto:kostya.kanyuka@bbsrc.ac.uk))

Mr Richard Gutteridge (Lead for the Take-all Research and with a major interest in providing practical solutions to minimise the risk of take-all disease in the field) ([richard.gutteridge@bbsrc.ac.uk](mailto:richard.gutteridge@bbsrc.ac.uk))

There is no official closing date. However, potential applicants are encouraged to contact us prior to Easter 2010, so that enough time will be available for us to support the selected candidates as they fully develop a fellowship application which is ambitious, makes excellent use of the local research facilities and is well integrated with the ongoing research activities at Rothamsted. Most of the appropriate funding sources for these two posts, for example, the BBSRC Institute Career Track Fellowships and the EU early career track fellowships, have deadlines in mid- summer / early autumn 2010.

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