Two PhD studentships available at the School of Biological Sciences, Royal Holloway University of London, laboratory of Dr Alessandra Devoto

Project Title: Host processes required for pathogens reproduction to uncouple stress-induced growth in crops

Supervisor: Dr Alessandra Devoto
Email: Alessandra.devoto@rhul.ac.uk

Co-supervisors: Dr Pietro Spanu (Imperial college)

Project description:
We will elucidate host processes linked with pathogens growth and uncover cellular and metabolic changes associated with their demands in plants. Cell differentiation can be modulated at the fungal infection site and endoreduplication mediates fungus demands (Chandran etal, PNAS,107,460-465,2010). These exciting findings highlight that hormonal cross-talk associated with defence has a profound effect on the host development ultimately increasing metabolic activity . In a high-throughput screening we will deliver microbial effectors and check their effect on the ploidy and on cell expansion linked to infection. Software for pathway/network reconstruction will be implemented. This is a collaborative project between Dr Alessandra Devoto at RHUL and Dr Pietro Spanu at Imperial College. This research will provide biotechnological solutions for improving plant resistance. Above all, it will provide innovative biotechnological solutions for plant biomass utilization by identifying plant strategies to rescheduling the energy between stress responses and growth. A greater understanding of the metabolism involved will also forge novel biotechnological routes to discovering phytopharmaceuticals in plants.

Recent references:
1. NOIR S, BÖMER M, TAKAHASHI N, ISHIDA T, TJIR-LI T, BALBI V, SHANAHAN H, SUGIMOTO K AND DEVOTO A (2013) Jasmonate controls leaf growth by repressing cell proliferation and the onset of endoreduplication while maintaining a potential stand-by mode. Plant Physiology 161 (4) 1930-1951
2. Spanu et al (2010) Genome Expansion and Gene Loss in Powdery Mildew Fungi Reveal Tradeoffs in Extreme Parasitism. Science 330: 1543-1546
3. BALBI V, DEVOTO A (2008) Jasmonate signalling network in Arabidopsis thaliana: crucial regulatory nodes and new physiological scenarios. New Phytologist, 177: 301-318

Further details can be found at

http://www.rhul.ac.uk/biologicalsciences/prospectivestudents/postgraduateresearch/phdstudentships2014.aspx

The closing date for application is the 24th January 2014.

Two PhD studentships available at the School of Biological Sciences, Royal Holloway University of London, laboratory of Dr Alessandra Devoto

Project Title: Analysis of chromatin remodelling during hormone treatment to increase fitness potential of plants during stress responses

Supervisor: Dr Alessandra Devoto
Email: Alessandra.devoto@rhul.ac.uk

Project description:
It is of paramount importance to analyze the molecular mechanisms regulating stress response and tolerance in higher plants to develop stress-tolerant plants. Gene expression is also regulated through chromatin remodelling, that is the process of inducing changes in chromatin structure. Understanding the mechanism by which chromatin remodelling and/or hormone signalling components work in regulating cell growth in response to the stress, will contribute to increase fitness potential (and biomass accumulation) of plants during stress, a critical issue for a sustainable agriculture development This project will establish a novel screening method using state-of-the-art technology to study problems that were not readily tractable until now, allowing the applicant's to develop cutting-edge skills of wide applicability. Using high-throughput functional genomics, we will establish the role of newly identified molecular components of jasmonate (JA)-mediated stress and development. Software for pathway/network reconstruction will be implemented.

Recent references:
1. Noir S, Bömer M, Takahashi N, Ishida T, Tjir-Li T, Balbi V, Shanahan H, Sugimoto K And Devoto A (2013) Jasmonate controls leaf growth by repressing cell proliferation and the onset of endoreduplication while maintaining a potential stand-by mode. Plant Physiology 161 (4) 1930-1951
2. Balbi V, Devoto A (2008) Jasmonate signalling network in Arabidopsis thaliana: crucial regulatory nodes and new physiological scenarios. New Phytologist, 177: 301-318

Further details can be found at

http://www.rhul.ac.uk/biologicalsciences/prospectivestudents/postgraduateresearch/phdstudentships2014.aspx

The closing date for application is the 24th January 2014.