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2010 : February 2010 - Fast Breaking Papers : Sophien Kamoun Talks About Effector Biology

fast breaking papers - 2010

February 2010



Sophien Kamoun talks with *ScienceWatch.com* and answers a few questions about this month's Fast Breaking Paper Paper in the field of Plant & Animal Science. The author has also sent along an image of his work.



Article Title: Emerging Concepts in Effector Biology of Plant-Associated Organisms

Authors: Hogenhout, SA;Van der Hoorn, RAL;Terauchi, R;**Kamoun, S**
 Journal: MOL PLANT MICROBE INTERACTION, Volume: 22, Issue: 2,
 Page: 115-122, Year: FEB 2009

* John Innes Ctr, Sainsbury Lab, Norwich NR4 7UH, Norfolk, England.

* John Innes Ctr, Sainsbury Lab, Norwich NR4 7UH, Norfolk, England.

* John Innes Ctr, Dept Dis & Stress Biol, Norwich NR4 7UH, Norfolk, England.

(addresses have been truncated.)

SW: Why do you think your paper is highly cited?

At the moment, effector biology is a hot topic in the fields of plant biology and plant pathology.

Understanding the molecular function of effectors (molecules secreted by plant-associated organisms to manipulate their host plant) is currently viewed as critical for a mechanistic understanding of plant colonization by other organisms.

In addition, this is a review article written by four authors that are experts on different aspects of effector biology. As a consequence, we covered a diversity of concepts and taxa whereas most review articles on the subject tend to be more specialized. Finally, the journal *Molecular Plant-Microbe Interactions (MPMI)* is the leading journal in the field. *MPMI* is widely read, given that it is the flagship publication of the International Society of Molecular Plant-Microbe Interactions.

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

The review is a synthesis of the concepts that emerged from the study of effectors of plant-associated organisms with a particular focus on concepts that are common to a

Figure 1



Plant pathogen effectors alter plant immunity.

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diversity of phylogenetic groups. Also, we attempted, as much as possible, to include original ideas and prospects for research in the field.

SW: Would you summarize the significance of your paper in layman's terms?

Effector biology aims at understanding at the molecular level of how plant-associated organisms manipulate their host plants and how plants respond to these perturbations. Many of the organisms we covered are major plant pathogens that present a significant threat to human welfare and world food security. A detailed understanding of the mechanisms of pathogenicity and plant immunity enables novel approaches to plant disease management.

SW: How did you develop the idea for this review, and were there any problems along the way?

We were invited by the Editors of *MPMI* (Pietro Spanu and Jonathan Walton) who wanted us to cover the emerging theme of "effectors in plant-microbe interactions." The main challenge in putting the review together was to decide how to structure the text and which topics to emphasize. A key decision was to organize the review based on general concepts that apply to multiple groups of plant-associated organisms.

SW: Where do you see your research leading in the future? Do you foresee any social or political implications for your research?

My lab studies *Phytophthora infestans*, the potato blight pathogen that is notorious for having triggered the Irish potato famine in the mid-nineteenth century. We aim at understanding how exactly the effectors of *P. infestans* alter plant immunity.

There are important social implications for this research and the food security issue is high on the political agenda right now. Potato late blight continues to cost modern agriculture billions of dollars annually and also impacts subsistence farming in developing countries. The knowledge gained from the study of *P. infestans* effectors can be used to improve the breeding and deployment of disease resistant varieties.

Sophien Kamoun, Ph.D.

Senior Scientist and Head

The Sainsbury Laboratory

Norwich

United Kingdom

Web

Figure 1:



Figure 1:

Plant pathogen effectors alter plant immunity.

KEYWORDS: PROGRAMMED CELL-DEATH; PYRENOPHORA-TRITICI-REPENTIS; E3 UBIQUITIN LIGASE; PHYTOPHTHORA-INFESTANS; DISEASE-SUSCEPTIBILITY; INNATE IMMUNITY; III EFFECTORS; HOST-PLANT; PTR TOXA; MICROBE INTERACTIONS.



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