B·DEBATE International Center for Scientific Debate BARCELONA

CRAG CENTRE DE RECERCA EN AGRIGENÒMICA CSIC IRTA UAB

ROBERT FLUHR CV

SPEAKER AT:

THE DEATH OF PLANT CELLS.
FROM PROTEASES TO FIELD APPLICATIONS

October, 2nd and 3rd , 2013, Barcelona

Robert Flurh, Head of a research lab in the Department of Plant Sciences and the Department for Biological Services in Weizmann Institute of Science, Rehovot, Israel

Robert Fluhr is head of a research lab in the department of Plant Sciences in the Weizmann Institute of Science. In addition to this activity he heads the Department for Biological Services in the Institute. Plants respond rapidly to defend themselves from multiple environmental insults that include abiotic and biotic challenges. One common manifestation of plant defense is programmed cell death (PCD). Prof. Fluhr's main interests are in understanding the control of cell death in relation to reactive oxygen species (ROS) and proteases. His lab has conducted research in stress promoted ROS produced by NADPH oxidases, aldehyde oxidases, quinone reductases or by organelles and has helped set up a bioinformatics platform to identify the expression of ROS species (app.agri.gov.il/noa/ROSMETER.php). In work on proteases, the group has shown the conserved features of an important group of plant protease inhibitors, serpins and their role in controlling vacuolar cell death.

B·DEBATE International Center for Scientific Debate BARCELONA

CRAG CENTRE DE RECERCA EN AGRIGENÒMICA CSIC IRTA UAB

ROBERT FLUHR

SPEAKER AT:

THE DEATH OF PLANT CELLS.

FROM PROTEASES TO FIELD APPLICATIONS

October, 2nd and 3rd , 2013, Barcelona

Serpins Control Cell-death Proteases During Biotic and Abiotic Stress

Features of programmed cell death (PCD) such as cell shrinkage and DNA fragmentation are common to animals and plants; yet, the molecular signaling components initiating PCD differ. Less is known about the possibility of shared mechanisms in the final execution steps of PCD. Serpins are an important group of proteinase inhibitors that uniquely curb the activity of proteases by irreversible inhibition; however, their role in plants remains obscure. We show that during plant cell death initiated by necrotrophic interactions, AtSerpin1, present in the cytoplasm exhibits prosurvival function by inhibiting its target pro-death vacuolar protease, RD21. Elicitors of PCD like BTH and oxalic acid, stimulated changes in vacuole permeability that resulted in concomitant formation of a covalent AtSerpin1-RD21 complex. Mutant plants lacking RD21 or plants with AtSerpin1 overexpression exhibited significantly less elicitor-stimulated PCD than plants lacking AtSerpin1. Reactive oxygen species are pervasive intermediates that appear to play a role in the signaling process which lead to vacuolar-mediated cell death. Thus, a degree of commonalty exists between animal and plant execution of certain types of PCD where a serpin controls the pro-death functions of compartmentalized proteases by determining a set-point for their activity.

B·DEBATE IS AN INITIATIVE OF: biocat "la Caixa" Foundation

WITH THE COLLABORATION OF: VIB Agrisera Antibodies for plant sciences