B·DEBATE International Center for Scientific Debate BARCELONA

CRAG CENTRE DE RECERCA EN AGRIGENÒMICA CSIC IRTA UAB

VERONICA FRANKLIN-TONG CV

SPEAKER AT:

THE DEATH OF PLANT CELLS.

FROM PROTEASES TO FIELD APPLICATIONS

October, 2nd and 3rd , 2013, Barcelona

Hanele Tuominen, University of Birmingham, School of Biosciences, Birmingham, United Kingdom

Noni Franklin-Tong's research focuses on the cellular mechanisms involved in the model cell-cell recognition system of self-incompatibility (SI) in Papaver rhoeas (the Field Poppy). She has made major contributions to the field of self-incompatibility, a field that has high importance in relation to the future focus on food security. Her research has had a world-wide impact in the broader fields of plant cell signalling, the plant cytoskeleton and programmed cell death in plants. Her work includes several publications in Nature, has been highlighted in News & Views and "Editor's Choice" in Nature and in "Leading Edge" in Cell. Noni is currently Secretary General for the International Association of Sexual Plant Reproduction Research (IASPRR). She is currently on the Editorial Board of Journal of Experimental Botany, and Plant Reproduction, and is a Review Editor for Frontiers in Plant Physiology. Noni has a long-term commitment to enthusing children about science education and has been involved in providing the general public with a broader understanding of science through a number of activities. She was one of the original BBSRC Regional Coordinators of the Schools Liaison Scheme.

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Integrating the Signalling Networks That Trigger Programmed Cell Death in Self-incompatible Papaver Pollen

Self-incompatibility (SI) is a genetically-controlled mechanism used by many angiosperms to prevent self-fertilization and inbreeding. A multi-allelic S locus allows discrimination between “self” (incompatible) pollen from “non-self” pollen on the stigma. Interaction of matching pollen and pistil S-determinants allows “self” recognition and triggers rejection of incompatible pollen. The S-determinants for Papaver rhoeas (poppy) are PrsS and PrpS. PrsS is a small novel protein that acts as a signalling ligand that interacts with its cognate pollen S-determinant PrpS, a small novel transmembrane protein. Interaction of PrsS with incompatible pollen stimulates increases in cytosolic free Ca2+ and influx of Ca2+ and K+. ROS and NO signals are also implicated. Downstream targets include the cytoskeleton, a soluble inorganic pyrophosphatase, and a MAP kinase, PrMPK9. The major focus for SI signals is initiation of programmed cell death (PCD). I will provide an overview of our understanding of how PCD in this system operates, focusing on how the signals and components are integrated. I will also discuss our recent functional expression of PrpS in Arabidopsis thaliana pollen.

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