S005 Self-incompatibility in *Papaver*: identification of the pollen *S*-determinant

Natalie S. Poulter, Michael J. Wheeler, Barend H. J. de Graaf, Ruth M. Perry, Sabina Vatovec, F. Christopher H. Franklin and Noni Franklin-Tong

School of Biosciences, University of Birmingham, Edgbaston, Birmingham. B15 2TT, UK.

Many flowering plants are hermaphrodite, posing the problem of self-fertilization and the subsequent loss of genetic fitness in the offspring. To prevent this, many plants have developed a genetically controlled mechanism called self-incompatibility (SI) which allows self (incompatible) pollen to be recognized and rejected before fertilization can occur. In *Papaver rhoeas,* the pistil *S*-determinant (*PrsS*, Papaver rhoeas stigma S) is a small secreted protein that interacts with incompatible pollen, causing a Ca^{2+}-dependent signalling network. SI triggers several downstream events including depolymerization of the cytoskeleton, phosphorylation of p26.1 (a soluble inorganic pyrophosphatase) and p56 (a MAPK) and results in programmed cell death (PCD) involving several caspase-like activities.
Recently, the *Papaver* pollen *S*-determinant *PrpS* (Papaver rhoeas pollen S) was identified. *PrpS* encodes a ~20 kDa predicted transmembrane protein with no homology to known proteins. It is specifically expressed in pollen, linked to the pistil *S* gene, and displays the high polymorphism expected of an *S* locus determinant. I will be presenting evidence demonstrating *PrpS* is the pollen *S*-determinant. The discovery and characterization of *PrpS* strongly supports the hypothesis that *Papaver* SI is triggered by a receptor-ligand interaction.