

P013 Self-incompatibility in *Papaver* activates a ligand-gated ion channel permeable to Ca^{2+} and K^{+}

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Self-incompatibility (SI) is an important mechanism to prevent self-fertilization in flowering plants. Interaction between identical alleles of the pollen and pistil S-determinants results in rejection of self pollen. In *Papaver rhoeas*, the pistil S-determinants (PrsS) interact with the pollen S-determinant (PrpS) and trigger a Ca^{2+} -dependent signalling network resulting in programmed cell death of incompatible pollen tubes. Although we established that increases in $[\text{Ca}^{2+}]_{\text{cyt}}$ involve Ca^{2+} influx^{2,3}, the nature of the channels has not been investigated.

We present whole cell patch clamping data of *Papaver* pollen protoplasts. Addition of PrsS stimulated a large inward conductance that is permeable to Ca^{2+} , displays S-specificity and is dose-dependent. These SI-stimulated Ca^{2+} currents were inhibited by La^{3+} , insensitive to pH and not inhibited by verapamil; ion selectivity exhibited is $\text{Ba}^{2+} \sim \text{Ca}^{2+} > \text{Mg}^{2+}$. Unexpectedly, SI also triggers a large K^{+} permeable channel activity. There are remarkably few studies investigating the effects of physiological stimuli on pollen plasma membrane channels. These studies, demonstrating PrsS protein stimulates a ligand-gated cation channel activity, contributes to our understanding of the earliest SI signalling events.