The mechanism of RNase

In this mechanism, the elongation of pollen tubes is arrested when they have gone through about a third of the pistil. The female component of the reaction of AI is a ribonuclease called the S- RNase , apparently degrades the ribosomal RNA (rRNA) within the pollen tubes in the case of identity between the alleles S male and female. By degrading the rRNA, the pollen tube can not synthesize new proteins (and enzymes) so that their growth is stopped in the upper third of pistils and ends collapsing. The male component of this system of AIG has been identified later and PiSLF protein has been named a member of the F-box proteins . Members of this group of proteins typically function as ubiquitin ligases , or "mark" with ubiquitin to products for alleles S than to direct their degradation in the proteasome .

In the Solanaceae the locus S is highly polymorphic multiallelic and encodes an allelic series of S-RNases. Allelic diversity within and between-population of this locus has been examined using approaches based on PCR . Such an approach has also been used to demonstrate that the S-RNases are involved in self-incompatibility observed in other families of angiosperms. The S-RNases show a characteristic pattern of 5 conserved regions and two hypervariable regions. It is considered that the former are related to the catalytic role of the enzyme, while the hypervariable regions are involved in allelic specificity.

The mechanism of the glycoprotein

This mechanism, in which the pollen tube growth is inhibited within minutes of contact with stigma has been described in detail in the species Papaver rhoeas (Papaveraceae). The determinant female literacy is a small molecule extracellular expressed only in the stigma. The male factor is in all probability, a membrane receptor (ie, an integral membrane protein that responds to binding of the female factor triggering a cascade of metabolic reactions within the cell), but has not been thoroughly checked. The interaction between male and female determinants transmits a signal within thepollen tube resulting in a strong influx of cations of calcium within it which interferes with its normal elongation pattern.

The calcium ion influx stops pollen tube growth within the first two minutes. In this state, inhibition of growth is still reversible. In fact, the elongation may be resumed if handled properly the experimental conditions, which results in the fertilization of the eggs. Thus, following the arrest of pollen tube elongation, the cytosolic protein "p26", a pyrophosphatase , is inhibited by phosphorylation , possibly determines the arrest of the synthesis processes of molecules in the pollen tube, which are essential for elongation, and a reorganization of the filaments of actin in the cytoskeleton of the vegetative cell of the tube pollen. At 10 minutes of arrival to the stigma, the pollen tube has undergone a series of irreversible changes that lead to his death. At 3-4 hours of pollination, fragmentation begins DNA pollen nuclear and finally to 10-14 hours, the pollen tube vegetative cell dies by apoptosis .

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