

P008 EA1-like peptides, grass-specific extracellular hydrophobic signalling ligands

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Small secreted peptides mediate numerous cell-cell-communication events in reproductive and developmental processes in plants. Although computational analyses of plant genomes have revealed the existence of hundreds of genes encoding for putative secreted peptide ligands, only little is known about their possible roles in cell signalling. In maize, the signalling peptide ZmEA1 was shown to represent the sole female gametophyte derived pollen tube attractant. Recently, ZmEA1 has been shown to interact with a yet unidentified interaction partner at the surface of maize pollen tube tips and becomes internalized and degraded, likely by receptor-mediated endocytosis. Expression of ZmEA1 from *Arabidopsis* ovules showed that it is secreted by synergid cells and can be used to attract maize pollen tubes *in vitro*. An update will be presented on the molecular identification of the ZmEA1 receptor. Moreover, by searching for homologous peptides, we have discovered a novel class of hydrophobic and polymorphic small proteins in grasses, named EA1-like proteins (EALs). Besides maize, ZmEA1 homologous proteins were also found in other grasses such as rice and *Sorghum bicolor*. As a common feature they all share a C-terminal EA1-box, short P- and A-boxes as well as N-terminal located signal sequences. We will present a molecular and cellular survey of several EA1-box containing proteins that enter the secretory pathway. A homologue of particular interest is ZmEAL2 representing the closest relative to ZmEA1. Semi-quantitative expression analysis of *ZmEAL2* showed strong expression during embryogenesis, indicating that this candidate signalling peptide contains a role unrelated to that of ZmEA1.