

P006 Secreted polypeptides potentially critical for male–female cross-talk elicited following pollen tube growth through stigma and style

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The delivery of non-motile male gametes for fertilization critically depends on precise cross-talk between the growing pollen tube and the female gametophyte. We have reconstructed tobacco pollen tube growth through the stigma and style and captured numerous secreted proteins following pollen tube interaction with the pistil. Their analysis provided evidence that pollen tube growth through the pistil endures diverse signalling pathways including small GTPases mediated signal transduction, response to chemical stimuli, membrane-fused secretion as well as proteins involved in metabolism and cell wall matrix remodelling. Proteins belonging to plant defensin-like family (DEFL), LORELEI-like GPI-anchored protein 3 (LLG3), plant lipid transfer proteins (LTPs), small GTPases as well as pectinases and invertases, were among the identified pollen tube-secreted proteins. We report that 20.8% of the secreted proteins possessed the putative amino-terminal signal peptide (SP) of which 90.5% were predicted as secreted through the ER-Golgi-TGN mediated secretory pathway. Majority (68.5%), were also predicted to be N-glycosylated at the Asp-Xaa-Ser/Thr sequon. Moreover, >12% of the SP-mediated pollen tube-secreted proteins are likely to be GPI-anchored and are thus potential pollen tube receptors. The discovery of novel as well as known pollen tube-secreted polypeptides in this study offers a glimpse towards better understanding of male-female signal perception during fertilization across plant species. The authors gratefully acknowledge the financial support from Czech Science Foundation (grants No. P501/11/1462 and P501/11/P321).