

P015 Sporophytic control of pollen tube growth and guidance in maize

Andreas Lausser, Irina Kliwer, Kanok-orn Srilunchang and Thomas Dresselhaus

Cell Biology and Plant Physiology, University of Regensburg, Universitätsstraße 31, 93053 Regensburg, Germany

Pollen tube germination, growth and guidance (progamic phase) culminating in sperm discharge is a multi-stage process including complex interactions between the male gametophyte as well as sporophytic tissues and the female gametophyte (embryo sac), respectively. We have studied inter- and intra-specific crossing barriers in maize and *Tripsacum*, and report here a precise description of progamic pollen tube development. Pollen germination and initial tube growth were found to form an early first crossing-barrier before arrival of pollen tubes at the transmitting tract. Pollination of maize silks with *Tripsacum* pollen and incompatible pollination of *Ga1s/Ga1s*-maize silks with *ga1*-maize pollen revealed two additional incompatibility barriers, namely transmitting tract mistargetting and insufficient growth support. After leaving transmitting tracts, pollen tubes have to navigate across the ovule in the ovular cavity. Pollination of an embryo sac-less maize RNAi-line allowed to determine the role of the female gametophyte for pollen tube guidance in maize. We found that female gametophyte controlled guidance is restricted to a small region around the micropyle, approximately 50-100 μm in diameter. This area is identical with the pollen tube guidance area of ZmEA1-based signalling. In conclusion, the progamic phase is almost completely under sporophytic control in maize.