Abstract Talk Dabringhausen:

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In flowering plants, sperm cells are transported by pollen tubes. While initially a large group of pollen tubes sets out to target ovules, typically only a single pollen tube arrives in the female gametophyte. Recent results have shown that the restriction of pollen tube number is achieved through fertilization-dependent degeneration of the pollen tube attracting synergids. We show that the gaseous plant hormone ethylene plays a critical role in coupling fertilization and synergid degeneration. We found that synergids of ethylene hyposensitive plants fail to degenerate, resulting in the attraction of supernumerary pollen tubes. Our data, in addition, suggest that ethylene accumulates in a fertilization-dependent manner and microinjection of the ethylene precursor ACC into female gametophytes results in specific ablation of synergid cells while other cells remain intact. Our results establish gas signaling as a novel mechanism for the rapid establishment of a pollen tube block.