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Electrical stimulation of *Arabidopsis thaliana*

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Plants respond to their environment in a multitude of ways. In our first report, we described a rapid movement response that occurred in plants without any physical contact with the seedlings based on electric charge. Experiments with genetically altered seedlings followed to isolate the pathway required for movement. Three varieties of seeds were planted in the laboratory under sterile conditions. After 5-10 days the seedlings were tested for their response to electric field stimuli, and video responses were recorded with the fluctuation in the electric field measured with an oscilloscope. Mutants of *A. thaliana* from ABRC tested included Jasmonate Resistant 1 (JAR1), which lack a functional synthetase in the jasmonate signalling pathway, and NHX7/SOS1, which contain homozygous mutagenized alleles for the Na+/H+ antiporter. Wild type (wt) (Col-1) from ABRC and mutant seeds were grown on low K+ media to support the growth of the hypersensitive NHX7/SOS1. Plant seedlings of wt *Thymus vulgaris*, *Arabidopsis thaliana* and *Mentha spicata*, starting at the 2-3 leaf stage, were capable of msec movement responses to objects that conveyed an electric charge. Movement responses were observed in 50% of wt Col-1 seedlings plated in low K+ media compared to 87% response of wt in regular salt media. The response rate was 18% for NHX7SOS1 and 24% for JAR1. Both types of genetically altered seedlings had a lower level of responsiveness compared to wt *A. thaliana*. Reduced responsiveness in JAR1 and SOS1 seedlings may be the result of seed genotype mixing, or crossover required between signalling pathways.

Speaker Biography

Diane Krill completed her Ph.D. in Developmental & Molecular Biology from Case Western Reserve University in Cleveland, Ohio. Her postdoctoral studies and an M.P.H. were completed at the University of Pittsburgh Graduate School of Public Health. She is currently a professor of biology at Point Park University in Pittsburgh, USA. The majority of her research publications involve the tumour microenvironment and angiogenesis as it relates to cancer. She successfully isolated a plant compound with therapeutic potential that prevents new blood vessel development in vivo in zebrafish, and in human stem cells. The plant assay system used to establish the effects of the plant compound on vascular tissue led to the study of electrical stimulation in the plant model, *Arabidopsis thaliana*. She is a member of the American Association for Cancer Research, the MS Society, and serves as a reviewer for the Journal of Cancer & Nutrition, Ethnopharmacology and other journals.

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