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Stearoyl-acyl carrier protein desaturase C; a case study in subfunctionalization and pleiotropy

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Stearoyl-acyl carrier protein desaturase C (SACPD-C) was first described as a seed-expressed gene associated with desaturation of oleic acid precursors in developing soybean seeds. Recently, we have identified that *SACPD-C* loss of function mutations and/or gene deletions result in aberrant nodule morphology, accelerated nodule senescence, and dramatically reduced seedling biomass accumulation. Dramatic changes were noted in both phytohormone profile and defense signaling in mutant lines; jasmonic acid species (JA, JA-ile) were reduced and OPDA levels were very significantly elevated relative to wild-type lines. A major marker of plant immune signaling, *Pathogenesis Related-1*, was also dramatically upregulated in mutant lines. This study highlights how seed-focused efforts can result in unforeseen consequences, as well as providing new insights into gene function and overall soybean physiology.