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### **Diarylcylopentenone pigment biosynthesis in *Paxillus involutus***

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The basidiomycete *Paxillus involutus* is one of the best studied ectomycorrhizal fungi at the molecular, physiological, and ecological level. It is known to produce 2,5-diarylcylopentenone pigments, among them involutin that likely serves as scavenger of free radicals. The biosynthesis of diarylcylopentenones is unclear, as three routes appear possible that either include or circumvent atromentin, i.e., a central intermediate for numerous basidiomycete pigments. We identified six genes (invA1 – invA6) in the genome of *Paxillus involutus* encoding tri-domain peptide synthetase-like enzymes. Biochemical analysis of the heterologously produced InvA enzymes proved atromentin synthetase activity for InvA1, InvA2 und InvA5. Combined evidence from biochemical in vitro enzyme characterization, transcriptomics, and feeding experiments to track the turnover of stable-isotope labeled precursors by *Paxillus involutus* suggested that the 2,5-diarylcylopentenones are synthesized via atromentin as POSTER SESSION ABSTRACTS 92 metabolic intermediate. We also characterized the *Paxillus involutus* phosphopantetheinyl transferase PptA, which converts the above quinone synthetases from their inactive apo- into the functional holo-forms.