The Fatty Acid Synthase of the Basidiomycete *Omphalotus olearius* Is a Single Polypeptide

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Fatty acids are essential components of almost all biological membranes. Additionally, they are important in energy storage, as second messengers during signal transduction, and in post-translational protein modification. *De novo* synthesis of fatty acids is essential for almost all organisms, and entails the iterative elongation of the growing fatty acid chain through a set of reactions conserved in all kingdoms. During our work on the biosynthesis of secondary metabolites, a 450-kDa protein was detected by SDS-PAGE of enriched fractions from mycelial lysates from the basidiomycete *Omphalotus olearius*. Protein sequencing of this protein band revealed the presence of peptides with homology to both $\tilde{U}$and β subunits of the ascomycete fatty acid synthase (FAS) family. The FAS encoding gene of *O. olearius* was sequenced. The positions of its predicted 21 introns were verified. The gene encodes a 3931 amino acids single protein, with an equivalent of the ascomycetous β subunit at the N-terminus and the $\tilde{U}$subunit at the C-terminus. This is the first report on an FAS protein from a homobasidiomycete and also the first fungal FAS which is comprised of a single polypeptide.

Key words: Omphalotus olearius, Fatty Acid Synthase, Basidiomycete