Title: Production of acarbose, a pharmaceutically relevant metabolite of *Actinoplanes* sp. SE50/110, in a suitable heterologous host

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**Background**

*Actinoplanes* spp. are Gram-positive, aerobic bacteria producing a variety of pharmaceutically relevant substances such as antibacterial or antifungal agents. Since 1990 the α-glucosidase-inhibitor acarbose has been produced and marketed for the treatment of type-2 diabetes mellitus using improved derivatives of the wild-type strain *Actinoplanes* sp. SE50/110. In the meantime the complete genome of *Actinoplanes* sp. SE50/110 has been sequenced and annotated (Schwientek et al., 2012a). The genome sequence has been used to carry out comparative transcriptome studies (Schwientek et al., 2012b) and to establish the cytosolic and the extracellular proteome (Wendler et al., 2012).

**Aims of the project:**

Acarbose is a pseudotetrasaccharide, the biosynthesis of which is directed by an acarbose biosynthesis cluster located in the genome of *Actinoplanes* sp. SE50/110. The aim of the PhD project is now to transfer this biosynthesis gene cluster into heterologous hosts and to study the production of the secondary metabolite acarbose. As soon as positive results are obtained the acarbose production should be optimized by using -omics technologies like transcriptomics, proteomics and metabolomics. The ultimate goal would be to construct a heterologous production strain which is capable of synthesizing acarbose at an industrial level.

**Requirements:**

Applicants should have finished their academic studies with a MSc or equivalent degree with a background in molecular biological sciences. Experience in molecular biology and preferably in either genetics and genomics or transcriptomics of microorganisms is required.
References:

