

P022 The *Streptomyces avermitilis* chimeric "haemoglobin-like" protein: a novel concept of a heme based monooxygenase. **Alessandra Bonamore, Andrea Attili, Simonetta Soro, Veronica Morea*, Fabio Arenghi° and Alberto Boffi**
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A novel chimeric protein (SAkim) made of a globin domain fused with a "cofactor free" monooxygenase domain has been identified within *Streptomyces avermitilis* genome. Structure based alignments show that the globin domain can be unambiguously assigned to the truncated haemoglobin family. In turn, the non-heme domain belongs to a large family of small (about 100 aminoacids) proteins annotated as putative monooxygenases, though lacking the cofactor (e.g. a metal, a flavin or a heme) necessary for oxygen activation. Sakim, expressed in *Escherichia coli* cells, exhibited a robust catalytic activity towards quinols oxidation and is under screening for oxidation of small aromatic substrates. These findings may account for novel functional roles of the truncated hemoglobin's family and provide a rational explanation for oxygen activation in the "cofactor free" monooxygenases. It can be hypothesized that truncated hemoglobins may act as multipurpose oxygen activating proteins whose catalytic activity is mediated by the interaction with cofactor free monooxygenases that act as substrate binding scaffolds.