

**P-013: CLONING AND CHARACTERIZATION OF PROTOSTADIENOL SYNTHASE, AN OXIDOSQUALENE CYCLASE THAT CATALYZES CYCLIZATION BUT NOT REARRANGEMENT**

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Oxidosqualene cyclases (OSC) convert oxidosqualene to cyclic triterpenoid secondary metabolites. More than 100 triterpene skeletons have been characterized and some have potentially important biological activity. Biological chemists strive to study such systems to obtain a wide variety of different triterpenoids and insights into how these enzymes function. The best-studied oxidosqualene cyclase is lanosterol synthase, which cyclizes oxidosqualene to a chair-boat-chair tetracycle and promotes rearrangement to a less strained tetracycle. Herein is described protostadienol synthase, an *A. fumigatus* protein that is 37% identical to lanosterol synthase from *S. cerevisiae*. This enzyme converts oxidosqualene to protostadienol, a triterpene with the fixed chair-boat-chair conformation of the initially cyclized ring system that has not undergone rearrangement. This enzyme offers a unique opportunity to study the cyclization and rearrangement reactions independently. Sequence analysis suggests that protostadienol synthase acquired some catalytically important mutations in comparison to lanosterol synthase, which switched the product profile from lanosterol to protostadienol with chair-boat-chair conformation.