Is an archaeal phosphoglucoisomerase required for catabolism in *Ensifer medicae*?

**INTRODUCTION:**
- The genome of *Ensifer medicae* WSM419 has been established ([http://www.ncbi.nlm.nih.gov/pubmed/21304680](http://www.ncbi.nlm.nih.gov/pubmed/21304680))
- The metabolic pathways are available on KEGG ([http://www.genome.jp/kegg/pathway.html](http://www.genome.jp/kegg/pathway.html))
- The KEGG pathway reveals 2 genes (Smed_0109 & the archaeal type Smed_2463) that encode for phosphoglucoisomerase (PGI) in *Ensifer medicae* WSM419
- A mutation in the locus tag Smed_0109 permits growth of the Smed_0109 mutant on the gluconeogenic substrate succinate suggesting that Smed_2463 could indeed encode an alternative PGI

**HYPOTHESIS:**
Smed_2463 can suppress a succinate defective phenotype that would be expected from a mutation in Smed_0109 and therefore Smed_0109 & Smed_2463 both encode PGI enzymes (a mutation in Smed_2463 and a double mutation in Smed_0109/Smed_2463 would be used to test this)

**PROJECT OUTLINE:**
In this project, you will investigate the role of Smed_2463 by:
1) Creating a single knockout mutation in Smed_2463 and a double knockout mutation (in Smed_2463 and Smed_0109)
2) Characterise the phenotype of constructed mutants
3) Performing complementation studies to restore a wild-type phenotype to constructed mutants

**TECHNIQUES YOU WILL LEARN**
- cloning, gene inactivation and verification, PCR, gel electrophoresis, protein assays, general microbiology.

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