

Genomics of a bioethanol-producing bacterium

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Zymomonas mobilis is an ethanol-producing α -proteo bacterium that is currently considered a highly potent candidate for large scale bioethanol production. This owes to the fact that it surpasses yeasts in ethanol production rates and purity, has simpler fermentation requirements, and harbors a small, ca. 2-Mb, genome, quite permitting for genetic engineering endeavors. In order to understand the biology of *Z. mobilis*, six different strains from various parts of the globe, belonging to two of its major subspecies, are being sequenced at the US DOE-JGI and the University of Athens (CSP_788284). Additionally, RNA sequencing and transcriptional profiling is underway for the most robust ethanol-producing *Zymomonas*, industrial strain ZM4 (CSP_52). Insights gleaned from the genomics data obtained so far reveal that the different strains examined, apart from their basic metabolic repertoire that is characteristic for the species, bear a non-negligible number of unique genes in both their chromosomal and extrachromosomal (plasmid) genetic material (1-4). Consequently, unexpected signature traits have been found for each of the sequenced strains relating to secondary metabolism, inhibitor resistance or detoxification, DNA mobility via presence of conjugative or insertion elements, CRISPR-immunity, etc. By completion of this project, a fairly enriched view of the *Z. mobilis* pangenome will be in hand and this will aid in synthetic biology directions and the built of designer strains.

Biography

Katherine M. Pappas completed her Ph.D. at the University of Athens (UoA) and postdoctoral studies at Cornell University, NY. She is currently Assistant Professor at UoA, where she teaches at the under- and postgraduate level. She has served as an elected administrative member in UoA, consultant for Food Safety in the Greek Ministry of Health (EFET), proposal evaluator in Greece and the EU, and ad hoc or permanent reviewer for highly reputable journals. She currently holds two collaboration projects with the US DOE-JGI, and is author of many papers in high impact-factor journals and book chapters.

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