Genomic Annotation of *Idiomarina* sp. FeNA

By: Waleed Amir

Characteristics of *Idiomarina* sp. FeNA

- *Idiomarina* sp. FeNA is a rod-shaped bacteria
  - Isolated from Catalina island
- Marine sediment - extracellular electron transport
  - Annotated genome

Research Question

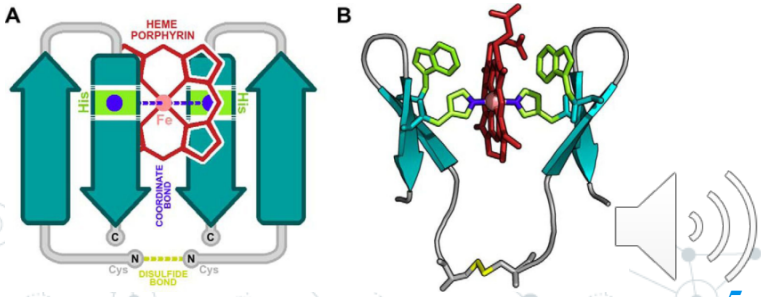
- Protein-binding motifs → extracellular electron transport
- Metabolic Pathways and potential
- Better understand microbes
  - use different inorganic materials under different environmental conditions.

Metabolism Pathways identified in *Idiomarina* sp. FeNA

- 2800 total available amino acid encoding genes
- Core Metabolism Pathways
  - Basic carbon metabolism (glycolysis, TCA), carbon fixation (calvin-benson)
- Respiratory pathway → oxygen
- Search for more heme-binding motifs

Heme Binding Motifs (C-H-X-X-H)

	2317	2241	2121	2005	1989	1983	1598	1423	740
Location	Cytoplasm	Unknown	Periplasm	Cytoplasm	Cytoplasmic Membrane	Cytoplasmic Membrane	Cytoplasm	Cytoplasm	Cytoplasm
Function	Glutamine--fructose-6-phosphate aminotransferase [isomerizing] (EC 2.6.1.16)	Membrane protein insertion efficiency factor YidD	Catalase KatE (EC 1.11.1.6)	SM-20-related protein	Cytochrome c oxidase polypeptide III (EC 1.9.3.1)	Glycerol-3-phosphate acyltransferase (EC 2.3.1.15)	Metallo-beta-lactamase family protein, RNA-specific	Cysteinyl-tRNA synthetase (EC 6.1.1.16)	DNA recombination and repair protein RecO



Why is this so important?

- Better understanding of microbe - metal oxidation
- Bioelectrosynthesis
  - Production of compounds through forming molecules on cathode/anode
- Bio-remediation
- Production of Bio-fuels
- Microbe electrode technology

Acknowledgements

- Thank you to Dr. Annette Rowe and Joshua Sackett Ph.D. for support and assistance
- Project funding through Center for Dark Energy Biosphere Investigations and the National Science Foundation