Genomic Annotation of *Idiomarina* sp. FeNA
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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)

<table>
<thead>
<tr>
<th>Location</th>
<th>Cytoplasm</th>
<th>Unknown</th>
<th>Periplasm</th>
<th>Cytoplasm</th>
<th>Cytoplasmic Membrane</th>
<th>Cytoplasmic Membrane</th>
<th>Cytoplasm</th>
<th>Cytoplasm</th>
<th>Cytoplasm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Glutamine--fructose-6-phosphate aminotransferase [isomerizing] (EC 2.6.1.16)</td>
<td>Membrane protein insertion efficiency factor YidD</td>
<td>Catalase KatE (EC 1.11.1.6)</td>
<td>SM-20-related protein</td>
<td>Cytochrome c oxidase polypeptide III (EC 1.9.3.1)</td>
<td>Glycerol-3-phosphate acyltransferase (EC 2.3.1.15)</td>
<td>Metallo-beta-lactamase family protein, RNA-specific</td>
<td>Cysteinyl-tRNA synthetase (EC 6.1.1.16)</td>
<td>DNA recombination and repair protein RecO</td>
</tr>
</tbody>
</table>

![Diagram of Heme Binding Motifs](image_url)
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.