Background and Significance

- Vinyl Chloride, a human carcinogen, contaminates surface water, groundwater, and soil (1).
- Freshwater polluted or spiked with vinyl chloride have been widely studied.
- Vinyl chloride removal studies near coastal regions are absent.
- This study aims to discover salt-tolerant vinyl chloride degrading bacteria and to understand their growth mechanisms and metabolic activities.

Objective: Discover salt-tolerant vinyl chloride degrading bacteria to understand their growth mechanisms and metabolic activities.

Methodology

**Culture Bacteria (Salt Concentration)**

**Collect Samples (After Incubation Time)**

**Record Optical Density @ 600nm**

**Plot Growth Curves & Growth Rate Curves**

**Analyze Data**

**Select Best Candidates For Next Phase**

Results & Discussions

![Figure 3](https://example.com/f3.png)  
**Figure 3.** Illustrates growth rate (1/day) of all bacteria selected at all salt concentrations.

![Figure 4](https://example.com/f4.png)  
**Figure 4.** Illustrates cell concentration (cells/mL) against incubation time (hours) of each bacteria. No salt (top left), 1.75% (top right), 3.50% (bottom left), and 7.00% (bottom right).

Results & Discussions (continued)

**Maximum Growth Rates at Specific Period**

![Figure 5](https://example.com/f5.png)  
**Figure 5.** Illustrates maximum growth rates (1/day) of all bacteria at specific period.

**Conclusion:**

- Bacteria (5) and (7) highest growth rate for 0%, 1.75% and 3.50% salt concentrations.
- (3), (5), (6), and (7) overall growth rate >1x10^4 cells/hr for all salt concentrations.

On-going & Future Work

- **Phase I**
  - Salt Concentrations => 0%, 1.75%, 3.5%, 7%

- **Phase II**
  - Temperature (top 3 bacteria) => 28°C, 20°C, 15°C

- **Phase III**
  - Respiration => Anaerobic/ Aerobic

- **Phase IV**
  - Substrate Concentrations =>
    - 100%, 50%, 10%, 1%, and 0.1%

- **Phase V**
  - Vinyl Chloride Concentrations

References:

2. Agricultural Research Service Culture Collection NRRL, USDA, IL. (nrrl.ncaur.usda.gov)