



# Life in Extreme Environments

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# My Educational Background

- **2016-Present:** Department of Biological Applications and Technologies, University of Ioannina  
**Five-year degree with MSc embedded**
- **2021-Present:** University of Copenhagen, Denmark  
**Individual MSc Research Thesis**
- 10/2020-Present: **Diploma Project** on *Extinction Debt in Ecosystems of Extreme Isolation*  
supervised by **Prof JM Halley**
- 2/2021-Present: **Individual MSc Research Project** on *Life in Extreme Environments*  
supervised by **Prof UG Jørgensen, A Priemé & MB Madsen**

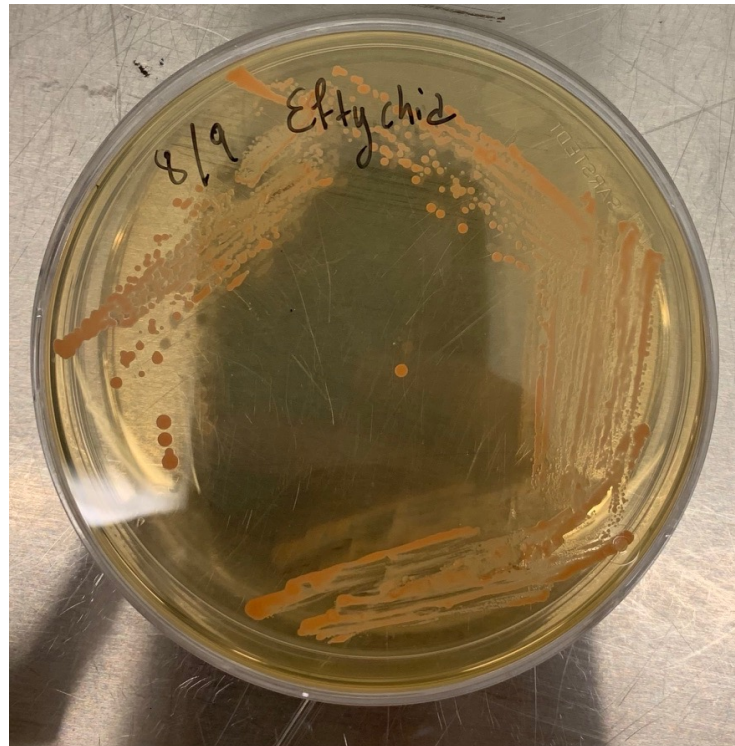
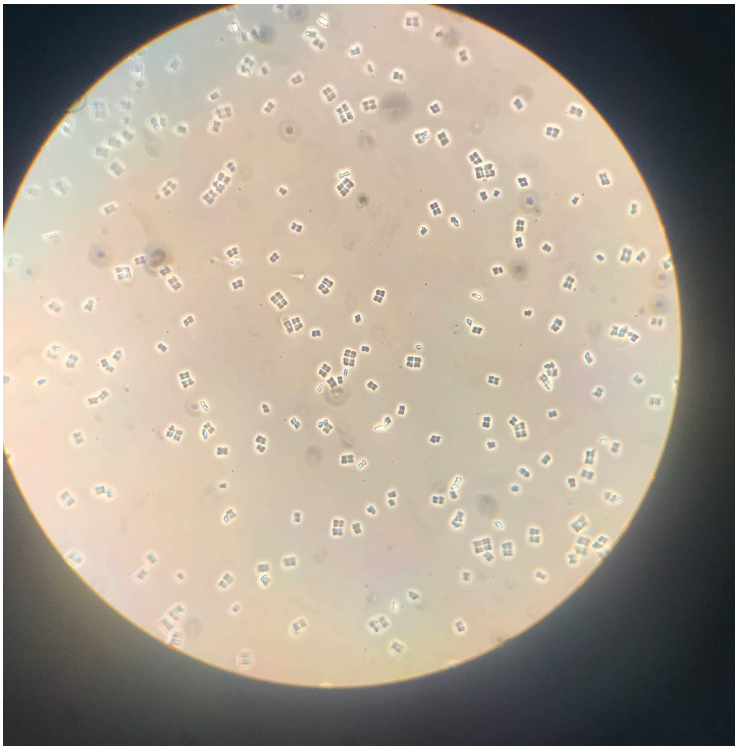
A photograph of a laboratory bench. On the left, there is a rack of several pipettes. In the center, a roll of paper towels stands next to a yellow bucket. To the right, there are several bottles, including one labeled 'ETHANOL', and a row of petri dishes. The background shows more laboratory equipment and a window.

# Current Work

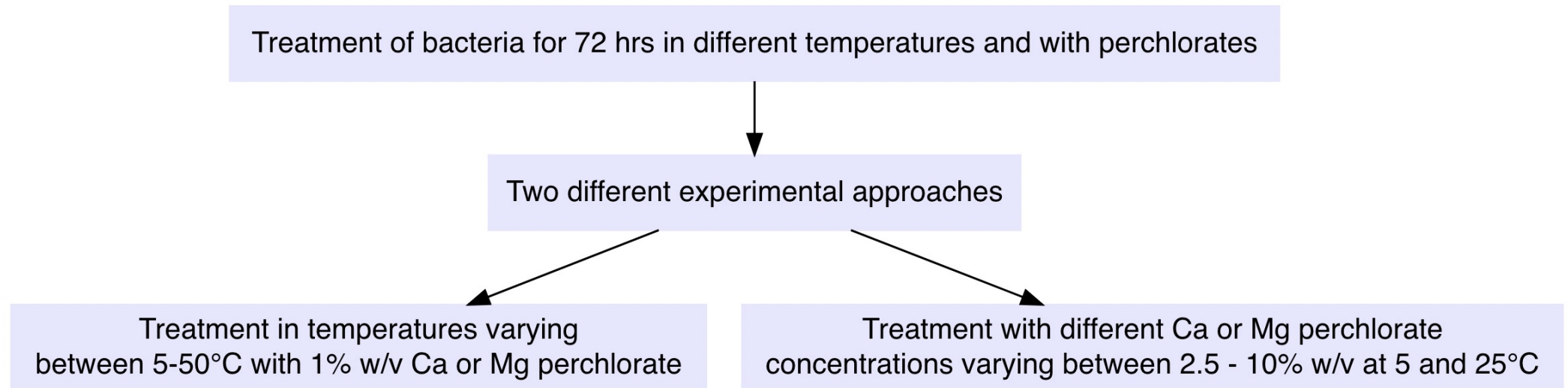
- Section of Microbiology, Universitetsparken 15, Nørre Campus
- Testing bacteria under Mars analogue conditions
- Focus on temperature gradient and treatment with chemicals

# *Deinococcus radiodurans*

- Extremophile bacterium
- Survives under extreme radiation amounts (~5.000 Gy)
- Assemblages of two, four or sixteen cells
- The cultures have a distinctive pink color

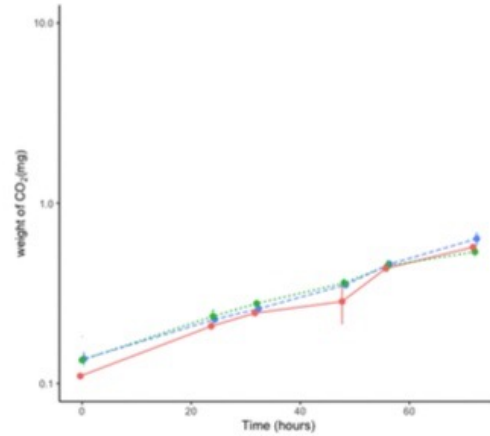


# Experimental Course

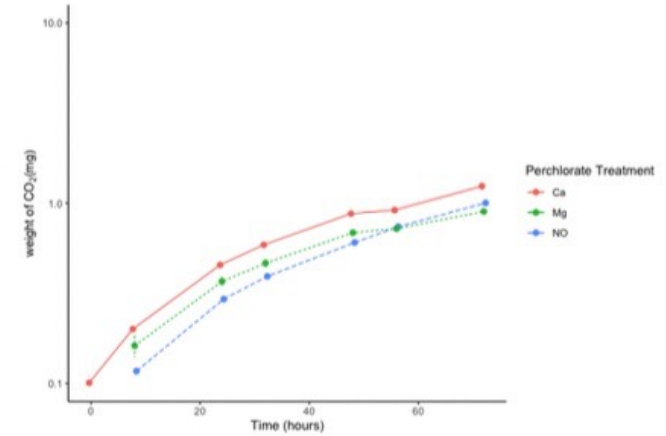


# Results

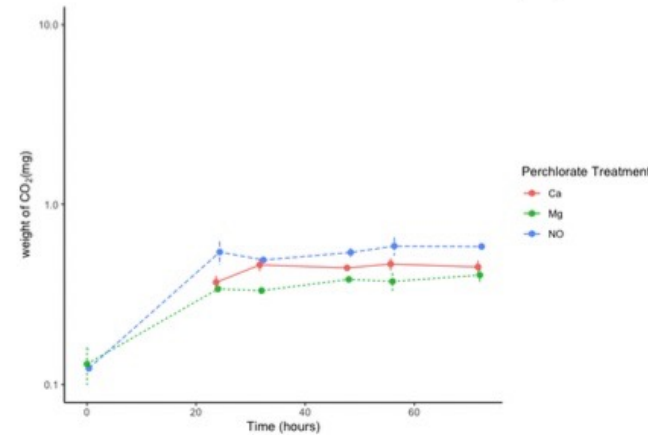
- Treatment in temperature gradient (5-50°C)
- Use of Perchlorates (Mg or Ca) in 1% w/v
- Growth dependence on temperature mainly



(a) 10°C Treatment.



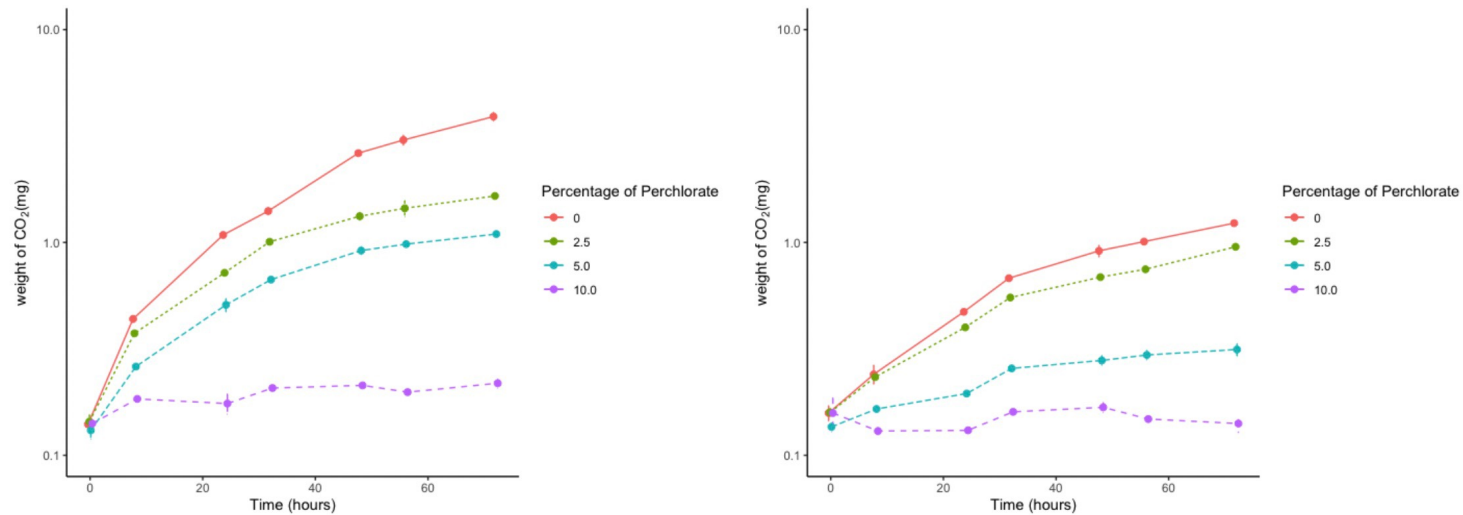
(b) 25°C Treatment.



(c) 45°C Treatment.

**Figure 1 | Amount of CO<sub>2</sub> for each different temperature and medium treatment.** The media used contained either no amount of perchlorates or 1% of Calcium or Magnesium Perchlorate

# Results



(a) Treatment with increasing concentrations of MgClO<sub>4</sub> at 25°C.

(b) Treatment with increasing concentrations of MgClO<sub>4</sub> at 5°C.

Figure 2 | Amount of CO<sub>2</sub> produced for treatment with increasing amounts of Magnesium Perchlorate at two different temperatures.

- Treatment with increasing perchlorate concentrations at 5 °C & 25 °C
- Approaches an upper limit in most cases
- Better response to Magnesium Perchlorate

# Conclusions

- Growth analysis of *D.radiodurans* in different temperature and perchlorate concentration gradients
- In 1% perchlorate concentration treatment, growth largely depends on the variation of temperature
- With increased perchlorate concentration, growth slows down with decreasing temperature