



## EDUCATION

### **STX (gymnasium) in Hjørring, Denmark**

2006-2009

General education with a focus on classical languages

### **Supplementary subjects required for BSc in Biology**

2013-2015

Math, Physics and Chemistry

### **BSc in Biology from Aarhus University**

September 2015 – June 2019

I focused my bachelor's degree towards microbiology and project-based courses as much as possible.

### **MSc in Biology from Aarhus University**

September 2019 – January 2023

Master's degree in biology focused on microbiology, molecular biology, and bioinformatics. I incorporated as many projects as was allowed to practice experimental design and data analysis.



## JOB EXPERIENCE

### **Cashier at SuperBest, Aarhus**

2011 - 2013

- In charge of register, customer support, break-schedule and closing-procedure

### **Temp worker, Aarhus**

May 2014 - August 2014

- Various cleaning jobs
- Phone-questionnaires for Epinion

### **Saver for YouSee, Aarhus**

August 2014 – January 2015

- Customer service and support
- Sale and administration of subscriptions

### **Bartender at Waxies, Aarhus**

October 2014 – October 2015

- Customer service
- In charge of day-to-day upkeep and schedule

### **Research assistant, Center for Electromicrobiology**

February 2023 – May 2023

- Metagenome sequencing of cable bacteria single-strain enrichments
- Manuscript on the single-strain enrichment method and proposal of nomenclature by SeqCode

### **Research assistant, CORC project**

June 2023 - November 30<sup>th</sup> 2023

- Manuscript on a new branch of the DsrEFH complex found in cable bacteria
- Co-supervising an Erasmus student in metagenome sequencing

### **PhD student, Center for Electromicrobiology**

December 2023 - November 2026



## BACHELOR'S PROJECT

- Supervisors: Ian Marshall and Jesper Bjerg
- In my bachelor's project I worked at the Center for Electromicrobiology to study cable bacteria. I established a single-strain enrichment of a marine cable bacterium in a sediment enrichment to study if certain morphological traits - such as diameter and number of ridges in the filament - changed at different timepoints in the growth-period.



## MASTER'S THESIS

- Supervisors: Andreas Schramm and Ian Marshall
- In my master's thesis I also studied cable bacteria at the Center for Electromicrobiology. I performed long-read sequencing on a single-strain enrichment of a marine cable bacterium to obtain a high-quality genome, which could be included in a comparative genomics study with 5 other high-quality genomes of cable bacteria. This analysis resulted in a core genome present in all cable bacteria. In addition, I collected data from proteomic and transcriptomic work with single-strain enrichments of cable bacteria which was used for comparison with the core genome to elucidate the central metabolism for all cable bacteria. Several highly conserved and highly expressed genes were annotated as 'hypothetical proteins', and some of these were chosen for structure prediction with AlphaFold. Three of these proteins had very similar structures to the known sulfurtransferase complex DsrEFH, which is missing in all known cable bacteria genomes, and this prompted an in-depth analysis of these proteins and a search for other similar proteins in the NCBI protein database. The results of the project were an updated metabolic model for all cable bacteria and a proposal for a new type of the DsrEFH complex found in sulfate reducers and sulfur disproportionaters.



## PROJECTS, CONFERENCES AND PRESENTATIONS

### ⚙️ VOCATIONAL TRAINING PROJECT

- Supervisors: Jan Lorenzen (DTI) and Rikke Meyer (AU)
- I worked with the Biotechnology team at the Danish Technological Institute to study the effect of specific bacteriophages on paint, with the aim of creating new ways to keep paint from rotting. My work included growing cultures of *Pseudomonas putida* and a bacteriophage (Psp4) that infects *P. putida* and making various experimental setups to test the growth of each organism in paint with and without the presence of the other.

### ⚙️ BIOLOGICAL PROJECT

- Supervisor: Ian Marshall
- My biological project was a methods-study to optimize the DNA extraction method for sediment enrichment cultures with cable bacteria. The aim was to get high molecular weight DNA in a sample with high purity that could be used for nanopore sequencing with Oxford Nanopore MinION.

### ⚙️ OTHER

- MicroEnergy 2022
  - o Poster on the central metabolism of cable bacteria and the newly discovered putative DsrEFH complex
- Cable bacteria workshop 2022
  - o 10 min talk on my Master's thesis focused on the putative DsrEFH protein complex
- OIKOS conference 2023
  - o 10 min talk on the ecology of cable bacteria as ecosystem engineers in various habitats.
- Electromicrobiology conference 2023
  - o Poster on the core genome and the updated metabolic model on the central metabolism of cable bacteria
- ISMSM-6 2023
  - o Poster on the putative new branch of the DsrEFH protein complex. I was unable to attend, and the poster was presented by my supervisor.

## ✍️ PRODUCTS AND COLLABORATIONS

### Paper in preprint (BioRxiv)

Digel, L., Justesen, M.L., Bonn e, R., Fransaert, N., Wouters, K., Jensen, P.B., **Plum-Jensen, L.E.**, Marshall, I.P.G., Nicolas-Asselineau, L., Drace, T., B ggild, A., Hansen, J.L., Schramm, A., B jesen, E.D., Nielsen, L.P., Manca, J.V. and Boesen, T. 2023. "Comparative electric and ultrastructural studies of cable bacteria reveal new components of conduction machinery." bioRxiv, 2023.05.24.541955.

- A study on the cellular structures and electrical properties of cable bacteria. My contribution included the genomic work I had done on single-strain enrichments of cable bacteria, and phylogenetic analysis and visualization.

### Paper published in *Systematics and Applied Microbiology*

**Plum-Jensen, L.E.**, Schramm, A. and Marshall, I.P.G. 2024. "First Single-strain Enrichments of *Electrothrix* Cable Bacteria, Description of *E. aestuarii* sp. nov. and *E. rattekaaiensis* sp. nov., and Proposal of a Cable Bacteria Taxonomy following the Rules of the SeqCode"

- The paper includes an optimized workflow for growing single-strains of cable bacteria in sediment enrichments, while presenting the first three single-strain enrichments of marine cable bacteria, of which two strains represent novel species. The high-quality genomes obtained with long-read sequencing from this and other studies now enables us to propose valid genus and species names for the otherwise candidate genera *Electronema* and *Electrothrix* by following the rules of the SeqCode.

### Paper planned in collaboration with the University of Bonn for submission to *Nature Microbiology*

**Plum-Jensen, L.E.** Mohr, M.G., Tanabe, T.S., Thorup, C., Wang, B., Madsen, N.S., Echers, S.G., Dueholm, M.K.D., Boesen, T., Dahl, C., Marshall, I.P.G. and Schramm, A.

- With the discovery of a putative DsrEFH complex, which has a high structural homology to known DsrEFH structures, but no sequence homology, we aim to study the sulfur transferase properties of the new DsrEFH complex both from TusA to DsrE and from DsrE to DsrC. The proteins TusA, DsrC and the DsrEFH complex from the genome of *Ca. Electronema aureum* GS has been inserted into a plasmid, and expressed in *E. coli* with the aim of confirming or denying the sulfur transfer between proteins using MALDI-TOF and individual cysteine exchange mutants.