

# Isabella WILKIE



## PROFILE

Marine microbiologist specialising in bioinformatic analysis of microbial populations, with experience developing pipelines for metagenomics, structural annotation, and population-level variation. I enjoy developing clear, reproducible pipelines, uncovering biological stories from large datasets, and helping others understand bioinformatic approaches.

## CONTACT DETAILS

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📍 Bremen, DE

## SKILLS

- Python3, R, Bash,  $\LaTeX$
- SLURM, snakemake, Git
- Communication and team collaboration
- Translating bioinformatic approaches for colleagues without computational experience

## LANGUAGES

- English (*native*)
- Italian (*native*)
- German (*native*)
- Spanish (*C1*)

## RELEVANT INTERESTS

- Personal computers (*building and maintaining*)
- Learning and testing new computational tools and approaches

## EDUCATION

**Dr. rer. nat. in Marine Microbiology** Apr 2022 - Mar 2026 (*scheduled*)  
International Max Planck Research School of Marine Microbiology (MarMic) and University of Bremen

- ◆ Thesis title: *Bioinformatic analyses of speciation and intra-population diversity within Verrucomicrobiota populations*
- ◆ Supervised by Dr. Luis Humberto Orellana Retamal, within the department of Molecular Ecology and the ERC Research Group for Ecological Genomics
- ◆ Committee members: Dr. Luis Humberto Orellana Retamal, Prof. Dr. Rudolf Amann, Prof. Dr. A. Murat Eren, Prof. Dr. Luis Miguel Rodriguez-Rojas
- ◆ Developed a pipeline to select representative metagenome assembled genomes (MAGs) of the understudied *Verrucomicrobiota* phylum from 10-years of North Sea spring bloom sequencing, identify niches of phylum members based on temporal dynamics as well as predicted gene content
- ◆ Analysed fine-scale variation in these populations over time via a pipeline to identify and interpret single nucleotide variants
- ◆ Compared genomes of one family, *Akkermansiaceae*, in the context of a gut-marine transition, focused on identifying key genes using structural homology
- ◆ Used my computational approaches to generate hypotheses which will be tested by wet-lab experimentalists

### MSc. in Marine Microbiology

Oct 2020 - Mar 2022

MarMic and University of Bremen

- ◆ Thesis title: *Exploring niche differentiation in functionally similar heterotrophic bacteria during phytoplankton spring blooms*
- ◆ For my thesis, I analysed North Sea spring bloom MAGs to determine the dynamics of fucosidase genes during recurring spring blooms, and start examining the family-level dynamics of *Verrucomicrobiota* in the community
- ◆ Developed a pipeline to quality filter and dereplicate MAGs, assign and filter for taxonomy, and annotate genes, which was the foundation for my PhD work
- ◆ Conducted a lab rotation to optimise RNA extraction and bioinformatic pipeline for polymetallic nodule-associated community transcriptomic analyses
- ◆ Conducted a lab rotation on developing an ontology for ocean debris and plastics for SDG14 in accordance with the environmental ontology (ENVO), with the aim of standardising terms for clearer communication

### BSc. in Biochemistry and Cell Biology

Oct 2017 - Jun 2020

Jacobs University Bremen

- ◆ Thesis title: *The role of dissolved inorganic phosphorus on the growth and elemental composition of globally important  $N_2$ -fixing microorganisms*
- ◆ Minor in Earth and Environmental Sciences

### International Baccalaureate

Sept 2015 - May 2017

International School Hannover Region

- ◆ High school diploma

## RELEVANT FIELD-WORK EXPERIENCE

### PS133/2 Island Impact Cruise

Nov - Dec 2022

South Georgia (South Atlantic)

- ◆ Collected surface water and sediment samples for microbial community description and analysis with a focus on sugar degradation and aerobic heterotrophy
- ◆ Conducted an amplicon sequencing analysis of all water samples to characterise the microbial community in relation to iron input of various sources

## RELEVANT TEACHING EXPERIENCE

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### Teaching Assistant

Jan 2023 - Jan 2025

MarMic and University of Bremen

- ◆ Helped organise two courses: "Linux and bioinformatics introductory course" and "Next generation sequencing and metagenomics" for MarMic MSc. students each year
- ◆ Gave one lecture each year entitled "From sequences to structures and functions", where I explained Alphafold and similar approaches
- ◆ Assisted students during the practicals, teaching metagenomics

### Lab Rotation Supervisor

May 2023 - May 2025

MarMic and University of Bremen

- ◆ Supervised six distinct MSc. students, each for six weeks
- ◆ Applied metagenomic approaches and analyses of amplicon sequences to different projects, from comparing long- and short-read sequencing approaches, to characterising communities from algae, penguin-associated sites, and surface water spring blooms

## PARTICIPATION IN RELEVANT WORKSHOPS

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### Structural Bioinformatics

Nov 2024

EMBL-EBI (online)

- ◆ Attended a one-week workshop on obtaining and interpreting experimental and predicted protein structures
- ◆ Learned about several tools and resources for the analysis of structural data
- ◆ Practised using machine learning tools in the context of protein structures

### 7th EBAME Workshop on Computational Microbial Ecogenomics

Oct - Nov 2022

Brest, France

- ◆ Attended a two-week workshop on approaches in microbial ecogenomics
- ◆ Discussed various analyses for genome-resolved environmental metagenomics
- ◆ Obtained an overview of various tools and approaches

## PUBLICATIONS

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**Wilkie, I.,** Von Pössel, N., Sauma-Sánchez, T., Reintjes, G. & Orellana, L. H.. Conserved glycan-utilization strategies drive *Akkermansiaceae* success across aquatic and gut ecosystems. In revision at ISMEJ.

Xu, Y., Schultz-Johansen, M., Yao, H., **Wilkie, I., et al.** (2026). Phosphate deprivation restricts bacterial degradation of the marine polysaccharide fucoidan. *Nature Microbiology*, 11. <https://doi.org/10.1038/s41564-025-02240-z>.

Lonsing, A., Martens, G. A., Resteu, A., Kizina, J., **Wilkie, I., et al.** (2025). Anaerobic Limonene Metabolism in a Methanogenic Enrichment Involves a Glycine Radical Enzyme. *Environmental Microbiology*, 27. <https://doi.org/10.1111/1462-2920.70192>.

**Wilkie, I.,** & Orellana, L. H. (2025). Elusive marine *Verrucomicrobiota*: Seasonally abundant members of the novel genera *Seribacter* and *Chordibacter* specialize in degrading sulfated glycans. *Systematic and Applied Microbiology*, 48(1), 126562. <https://doi.org/10.1016/j.syapm.2024.126562>.