



### Where I work Gerdhard Jessen

**I**n 2008, I was investigating the methane bubbling up on the beaches and in shallow waters of Mocha Island, off the coast of central Chile. I became intrigued by how microorganisms could thrive in methane-rich areas and changed my research focus from marine biology to extreme environments. I wanted to understand how methane acts as a source of energy and carbon for microbes.

Since then, I have explored a number of bizarre environments. In 2010, I went in a submarine down to 200 metres in the Black Sea, one of the world's largest anoxic water bodies. There, I found mats of filamentous bacteria that survive on sulfur compounds.

In 2017, I studied the microbes in Canada's tailing ponds, artificial lakes of water, sand and clay waste that are left behind after petroleum extraction. And I sampled the microorganisms living in 100 °C Antarctic hot springs in 2022.

I came home to Chile in 2018 and began collaborating with an international team researching the geomicrobiology of thermal features, including hot springs,

geysers and volcanoes. After travelling with the group to Argentina's active volcanic region, I got funding to explore the microbial communities that exist beneath hydrothermal vents in southern Chile, where the oceanic crust is subducting beneath the continental plate.

In this image, I am in the Atacama Desert in South America, the driest non-polar desert on the planet. I am measuring 80–100 °C steam released from a fumarole containing yellow sulfur, which crystallizes at its opening as the vapour cools. I also sampled sub-surface microbes that are flushed out with the fluids. We'll sequence their DNA to assess the microbial communities and their biological interactions.

My goal is to learn more about subsurface microbes in extreme environments. I want to understand how microbial forces shaped the planet and how these communities might shift in the future with climate change.

**Gerdhard Jessen** is a microbial ecologist at the Austral University of Chile in Valdivia.  
**Interview by Virginia Gewin.**

Photographed for *Nature* by Jacopo Pasotti.