

KOLLOQUIUM

Institut für Molekulare
Biowissenschaften

Sommersemester 2024



Microbial oxidation of atmospheric trace gases: from enzymes to ecosystems

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Monday, April 22nd, 2024, 17:15, Biocentre, N260 Room 313

The atmosphere provides most of the oxygen, carbon, and nitrogen that we depend on, but until now has been thought to lack sufficient energy to sustain life. Here I will demonstrate that diverse microbes live by harvesting the small amounts of hydrogen, carbon monoxide, and methane from air. Through research focused on the model bacterium *Mycobacterium smegmatis*, I will detail the physiological role, genetic regulation, and structural basis of this process. I will subsequently provide culture-based and culture-independent evidence that microorganisms from multiple phyla and diverse environments also meet their energy needs through this process. Finally, I will demonstrate that certain ecosystems are primarily powered by atmospheric energy sources, including many cave and desert ecosystems. These findings redefine the minimal requirements for life and have broad climate, medical, and astrobiological implications.

Invited by Prof. Müller

