

A novel pathway producing dimethylsulphide in bacteria

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A scientific team that includes researchers from the University of Barcelona (UB) has identified a novel pathway producing dimethylsulphide, a volatile organosulfur compound which plays a major role in climate regulation.

The study, published in the journal *Nature Communications*, is signed by M. Elena Mercadé and Ornella Carrión, researchers in the Department of Microbiology and Parasitology in Health at the Faculty of Pharmacy of the UB; Jonathan Todd and Andrew R. J. Curson (University of East Anglia, United Kingdom Unit); Deepak Kumaresan (University of Western Australia, Australia), and Yunyun Fu and Andrew Lang (Memorial University of Newfoundland, Canada).

The volatile compound dimethylsulphide (DMS) is important in climate regulation, the sulphur cycle and signalling to higher organisms. Ornella Carrión, first author of the paper and author of a PhD thesis centred on novel pathway producing dimethylsulphide, affirms that "it is estimated that around 3×10^{14} grams of this gas are produced every year. To date, it was thought that microbial catabolism of the marine osmolyte dimethylsulphoniopropionate (DMSP) was the major biological process generating DMS".

However, the present study reports the discovery and characterization of the first gene for DMSP-independent DMS production in any bacterium. This gene, *mddA*, encodes a methyltransferase that methylates methanethiol and generates DMS. "Surprisingly, *mddA* is present in

many taxonomically diverse bacteria, including the pathogen *Mycobacterium tuberculosis*, and in metagenomes from varied environments, being particularly abundant in soil environments. This novel pathway may significantly contribute to global DMS emissions, especially in terrestrial environments and could represent a shift from the notion that DMSP is the only significant precursor of DMS," says M Elena Mercadé.

In order to continue the study, the Natural Environment Research Council (NERC) of the United Kingdom has conferred a grant on the scientific team co-led by Jonathan Todd, Colin Murrell and Ornella Carrión that will enable to further develop the study on this novel pathway producing DMS on a research projects in which Dr Mercadé participates.

More information: "A novel pathway producing dimethylsulphide in bacteria is widespread in soil environments." *Nature Communications* 6, Article number: 6579 [DOI: 10.1038/ncomms7579](https://doi.org/10.1038/ncomms7579)

Provided by University of Barcelona

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