

## **New frontiers in understanding the pathway(s) of arsenic biomethylation and biovolatilisation using $^{13}\text{C}$ - and $^2\text{H}$ -labelled arsenic compounds**

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Arsenic (As) is a ubiquitous pollutant and its biogeochemical cycle is only partly known, especially with regards to biomethylation and biovolatilisation pathways. These two intertwined biological processes allow microorganisms to transform dissolved inorganic As to an array of organic and/or volatile forms.

We propose here a procedure encompassing several analytical methods designed to specifically uncover As biomethylation and biovolatilisation pathways in microorganisms using labelled compounds. Firstly, we will describe the procedure used to synthesize monomethylarsonous acid (MMAs(III)) and dimethylarsenic acid (DMAs(V)) labelled with  $^{13}\text{C}$  or  $^2\text{H}$ . Then, we will show how these compounds, together with all the relevant As compounds, can be separated using chemotrapping and/or HPLC and simultaneously quantified by ICP-MS and collected for IRMS analysis. Finally, we will apply this method to microorganisms' cultures in order to trace the labelled compounds in volatile and dissolved forms to retrace their formation pathway(s). These results will allow us to understand how these As compounds are formed and hopefully help us to harness this process for bioremediation.

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