# Unlocking metabolic secrets of anaerobic methanotrophic archaea

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Anaerobic methanotrophic archaea (ANME), such as *Ca*. Methanoperedens, are crucial for mitigating methane ($CH_4$) emissions in anoxic environments. However, little is known about their metabolic processes due to the difficulty in cultivating them in pure cultures and the complexity of their enrichments. One poorly understood aspect of ANME physiology is their ability to use different electron donors and acceptors, which greatly influences their metabolism and ecological function. In this study, we show that *Ca*. Methanoperedens can use carbon monoxide (CO) as an alternative electron donor, with CO oxidation rates being up to ten times higher than methane oxidation rates. Metagenomic and metatranscriptomic analyses revealed that CO dehydrogenases were highly expressed when the organism was exposed to CO, suggesting their important role in its metabolism. This research reveals that ANME are more metabolically versatile than previously thought, capable of utilizing CO in addition to methane, which challenges the traditional view of ANME as strict methanotrophs and requires a reconsideration of their physiology and ecological impact.