Electronic Supplementary Material (ESI) for Metallomics.
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Supplemental Information for Perspective: What is known, and not known, about the connections between alkane oxidation and metal uptake in alkanotrophs in the marine environment.

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Determining the specific substrate range of particular alkane-oxidizing enzymes is difficult, and researchers have taken different approaches to its characterization. In some cases, the information is based on the activity of the purified enzyme, whereas in other cases it derives from how disruption of a particular gene impacts the organism's growth on different substrates. In a third approach, researchers assess what size alkanes stimulate the transcription of the relevant RNA. Table 1 provides a guide to the substrate ranges of specific enzymes determined by all of these different published approaches.[1]

Enzyme	Active site Identity	Soluble or Particulate	Substrate range
Particulate methane monooxygenase (pMMO)	Dicopper	Particulate	C1-C4[2]
Soluble methane monooxygenase (sMMO)	Diiron	Soluble	C1-C7
Ethane monooxygenase	Dicopper (putative)	Particulate	C2[3]
Propane monooxygenase	Diiron	Soluble	C2-C4
Butane monooxygenase (BMO)	Diiron	Soluble	C2-C4
Alkane monooxygenase (AlkB)	Diiron	Particulate	C5-C32
Cytochrome P450 (CYP)	Heme iron	Soluble	C5-C12

LadA	Flavin	Soluble	>C15
AlmA	Flavin	Soluble	>C32

Table 1 Summary of Aerobic Alkane Oxidizing Enzymes

1. R. N. Austin and J. T. Groves, *Metallomics*, 2011, **3**, 775-787.
2. S. Drummond, S. Smith and H. Dalton, *Eur. J. Biochem.*, 1989, **182**, 667-671.
3. M. C. Redmond, D. L. Valentine and A. L. Sessions, *Appl. Environ. Microbiol.*, 2010, **76**.