



Figure S1. Mbn operons currently found in the JGI and NCBI databases. Operons are grouped according to Mbn operon type. Operons marked with an asterisk (*) are hand-annotated; MbnA sequences are additionally hand-annotated in most operons. Operons marked with a cross (†) are incomplete due to contig endpoints, and the fragmentary operons from the PBDCA2 bioreactor genome and *Methylobacterium* sp. B34 are not counted as “full operons” since the identity of other genes in the operon is unknown. Not shown and also not counted as full Mbn operons: defunct Group V operons from *Photobacterium temperata* J3 (NCBI: AXDT01000177.1), *Photobacterium temperata* subsp. *temperata* M1021 (NCBI: AUXQ01000040.1), and *Photobacterium temperata* subsp. *temperata* Meg1 (NCBI: JGVH01000024.1), wherein MbnB, MbnC, and MbnX are fragmentary pseudogenes. Additionally not shown are genes found in a microbial mat metagenome (NCBI: AGSF01004500.1) and a marine metagenome (NCBI: EM170757.1) where contig endpoints make it impossible to ascertain whether an MbnA is present. The relationship of MbnB homologues in the *Anabaena* and *Planktothrix* genomes to confirmed Mbn operons is unclear; while sequence similarity suggests a relationship to Group V MbnB genes, no identifiable precursor peptide is adjacent to the gene, and accurate detection of small genes encoding MbnAs in the absence of neighboring Mbn-related genes remains a challenge.