

A Novel Isolate Methylocystis sp. NLS7 as a promising candidate for industrial production of PHA from methane

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Recent interest in the mitigation of greenhouse gases has contributed to an increased amount of research in the field of methanotrophy. Studies have demonstrated that methane-oxidizing bacteria have the ability to utilize methane as their sole carbon and energy source to produce polyhydroxyalkanoates, or PHAs, which can be modified to produce renewable plastics. Methylosinus trichosporium OB3b and Methylocystis parvus OBBP have been presented as the most feasible bacteria to be used as industrial workhorses for polyhydroxyalkanoate production from methane. We have shown that a novel isolate Methylocystis sp. NLS7 has robust growth on methane, comparable to that of the OB3b and OBBP previously published. In addition, FTIR has confirmed the presence of polyhydroxyalkanoate purified from the biomass of NLS7. DSC studies show PHA from NLS7 has melting temperature similar to industrial PHA. Once the yield of PHA from NLS7 is further optimized, the methanotroph will become a promising candidate for the large-scale industrial production of polyhydroxyalkanoates. Genetic engineering studies are ongoing to maximize the yield and properties of the PHA produced.

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