Coupling S-adenosylmethionine-dependent methylation to growth: Design and uses

We present a selection design that couples S-adenosylmethionine-dependent methylation to growth. We demonstrate its use in improving the enzyme activities of not only N-type and O-type methyltransferases by 2-fold but also an acetyltransferase of another enzyme category when linked to a methylation pathway in Escherichia coli using adaptive laboratory evolution. We also demonstrate its application for drug discovery using a catechol O-methyltransferase and its inhibitors entacapone and tolcapone. Implementation of this design in Saccharomyces cerevisiae is also demonstrated.

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