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- (54) **Title:** PRODUCTION OF ACETYL-COENZYME A DERIVED ISOPRENOIDS

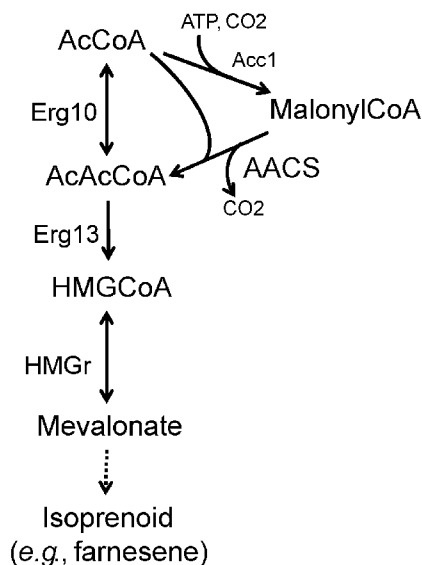


FIG. 5

(57) **Abstract:** Provided herein are compositions and methods for the heterologous production of acetyl-CoA-derived isoprenoids in a host cell. In some embodiments, the host cell is genetically modified to comprise a heterologous nucleotide sequence encoding an acetaldehyde dehydrogenase, acetylating (ADA, E.C. 1.2.1.10) and an MEV pathway comprising an NADH-using HMG-CoA reductase. In some embodiments, the host cell is genetically modified to comprise a heterologous nucleotide sequence encoding an ADA and an MEV pathway comprising an acetoacetyl-CoA synthase. In some embodiments, the genetically modified host cell further comprises one or more heterologous nucleotide sequences encoding a phosphoketolase and a phosphotransacetylase. In some embodiments, the genetically modified host cell further comprises a functional disruption of the native PDH-bypass. The compositions and methods described herein provide an energy-efficient yet redox balanced route for the heterologous production of acetyl-CoA-derived isoprenoids.



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