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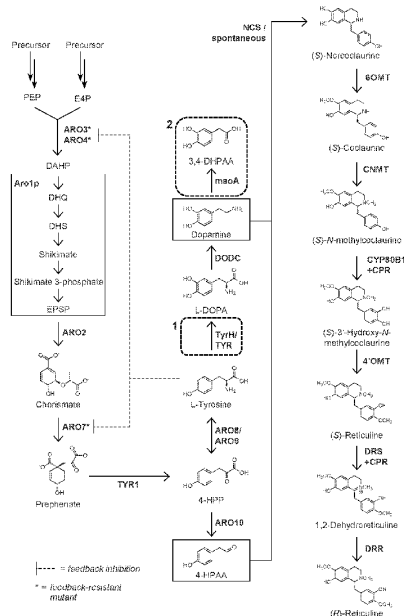


FIGURE 1

(57) Abstract: Methods and engineered cells are provided for increasing activity of a norcoclaurine synthase in a microbial cell. The method comprises, within the engineered microbial cell, contacting an engineered norcoclaurine synthase with a substrate, wherein contacting the substrate with the engineered norcoclaurine synthase increases conversion, within the engineered microbial cell, in comparison to a non-engineered norcoclaurine synthase.

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