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Title:	A genetic screen for increasing metabolic flux in the isoprenoid pathway of Saccharomyces cerevisiae: Isolation of SPT15 mutants using the screen
Authors:	Wadhwa, Manisha (/jspui/browse?type=author&value=Wadhwa%2C+Manisha) Bachhawat, A.K. (/jspui/browse?type=author&value=Bachhawat%2C+A.K.)
Keywords:	Metabolic engineering Carotenoids Isoprenoids α-Farnesene
Issue Date:	2016
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Citation:	Metabolic Engineering Communications, 3,pp. 164-172.
Abstract:	A genetic screen to identify mutants that can increase flux in the isoprenoid pathway of yeast has been lacking. We describe a carotenoid-based visual screen built with the core carotenogenic enzymes from the red yeast Rhodosporidium toruloides. Enzymes from this yeast displayed the required, higher capacity in the carotenoid pathway. The development also included the identification of the metabolic bottlenecks, primarily phytoene dehydrogenase, that was subjected to a directed evolution strategy to yield more active mutants. To further limit phytoene pools, a less efficient version of GGPP synthase was employed. The screen was validated with a known flux increasing gene, tHMG1. New mutants in the TATA binding protein SPT15 were isolated using this screen that increased the yield of carotenoids, and an alternate isoprenoid, α-Farnesene confirming increase in overall flux. The findings indicate the presence of previously unknown links to the isoprenoid pathway that can be uncovered using this screen.
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