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(54) Title: SUSTAINABLE PRODUCTION OF CANNABINOIDS FROM SIMPLE PRECURSOR FEEDSTOCKS USING *SACCHAROMYCES CEREVISIAE*

Different OLA analogues observed in chassis host

Starter used	Extender used	Product detected in <i>S. cerevisiae</i>	Proposed R-group on OLA side chain
C3 Propionic acid	Malonic acid	X	
C4 Butyric acid	Malonic acid	✓ Divarinic acid	
C5 Valeric acid	Malonic acid	✓	
C6 Hexanoic acid	Malonic acid	✓ Olivetolic acid	
C7 Heptanoic acid	Malonic acid	✓	
C8 Octanoic acid	Malonic acid	✓	
C9 Nonanoic acid	Malonic acid	X	
C10 Decanoic acid	Malonic acid	X	

Fig. 9

(57) Abstract: A recombinant cell of *Saccharomyces cerevisiae* that includes in its genome nucleic acids encoding cannabinoid biosynthetic pathway genes. A cannabinoid is produced by the recombinant cell in the presence of a cannabinoid precursor substrate and at least one of the cannabinoid biosynthetic pathway genes is from an organism other than *Cannabis sativa*, wherein the at least one of the cannabinoid biosynthetic pathway genes encodes a prenyltransferase. In an embodiment, the prenyltransferase is NphB from *Streptomyces sp.* having the amino acid sequence of any one of SEQ ID NOs: 8-11. Also disclosed is a method for producing a cannabinoid with the recombinant cell and the cannabinoid precursor substrate.

[Continued on next page]

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