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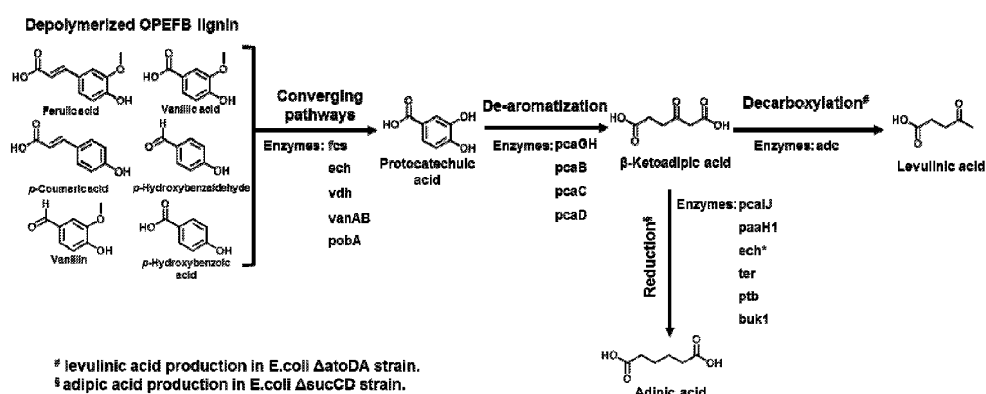
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(54) Title: BIOSYNTHESIS OF COMMODITY CHEMICALS FROM OIL PALM EMPTY FRUIT BUNCH LIGNIN

Figure 14



(57) **Abstract:** The present invention relates to the metabolic engineering of a microbial host for the synthesis of value-added products from oil palm empty fruit bunches (OPEFBs). In one embodiment, the genetically engineered microorganism is *Escherichia coli* comprising a metabolic pathway consisting of 9 enzymes (11 genes) to utilize depolymerized lignin, namely vanillin, *p*-coumaric acid, *p*-hydroxybenzaldehyde, vanillic acid, *p*-hydroxybenzoic acid and ferulic acid, to produce β -ketoadipic acid, which can be subsequently converted into commercially important derivatives such as adipic acid and levulinic acid. The enzymes are feruloyl-CoA synthetase (*fcs*), enoyl-CoA hydratase (*ech*), vanillin dehydrogenase (*vdh*), vanillate O-demethylase (*vanA*; *vanA* and *vanB*), *p*-hydroxy benzoate hydroxylase (*pobA*), protocatechuate 3,4-dioxygenase (*pcaGH*; *pcaG* and *pcaH*), 3-carboxy-cis,cis-muconate cycloisomerase (*pcaB*), 4-carboxymuconolactone decarboxylase (*pcaC*), and β -ketoadipate enol-lactone hydrolase (*pcaD*).

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