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(54) **Title:** COMPOSITIONS AND METHODS FOR PRODUCING CHEMICALS AND DERIVATIVES THEREOF

(57) **Abstract:** The present invention provides methods for producing a product of one or more enzymatic pathways. The methods include both enzymatic and chemical conversions as steps. Various pathways are provided for converting glucose into 5-dehydro-4-deoxyglucarate (DDG), and for converting glucose into 2,5-furandicarboxylic acid (FDCA). The methods also involve the use of engineered enzymes that perform reactions with high specificity and efficiency.

