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(54) Title: DNA SHUFFLING OF DIOXYGENASE GENES FOR PRODUCTION OF INDUSTRIAL CHEMICALS

(57) Abstract: This invention provides improved polypeptides, including dioxygenases, dehydrogenases, ligases and transferases that are useful for the biocatalytic synthesis of compounds such as α-hydroxycarboxylic acids, and aryl- and alkyl-hydroxy and carboxylic acid compounds. The polypeptides provided herein are improved in properties such as regioselectivity, enzymatic activity, stereospecificity, and the like. Methods for obtaining recombinant polynucleotides that encode these improved polypeptides are also provided, as are organisms that express the polypeptides and are thus useful for carrying out said biocatalytic syntheses. Also provided by the invention are methods for increasing said solvent resistance of organisms that are used in the synthetic methods.

DNA SHUFFLING OF DIOXYGENASE GENES FOR PRODUCTION OF INDUSTRIAL CHEMICALS

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims priority from and the benefit of U.S. Provisional Application No. 60/148,850, filed August 12, 1999, pursuant to 35 USC 119(e) and any other applicable statute or rule.

This application is related to USSN 09/373,333, filed August 12, 1999, "DNA Shuffling to Produce Herbicide Selective Crops", Subramanian, Venkitswaran, et al., which is a non-provisional application of USSN 60/096,288, filed August 12, 1998, USSN 60/111,146, filed December 7, 1998, and USSN 60/112,746, filed December 17, 1998, and related to International Application No. PCT/US99/18394, filed August 12, 1999, "DNA Shuffling to Produce Herbicide Selective Crops."

This application is also related to USSN 09/373,928, filed August 12, 1999, "DNA Shuffling of Monooxygenase for Production of Industrial Chemicals," Affholter, Joseph A., et al., which is a non-provisional of USSN 60/096,271, filed August 12, 1998, and USSN 60/130,810, filed April 23, 1999, and related to International Application No. PCT/US99/18424, filed August 12, 1999, "DNA Shuffling of Monooxygenase for Production of Industrial Chemicals."

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FIELD OF THE INVENTION

This invention pertains to the shuffling of nucleic acids to achieve or enhance industrial production of chemicals by dioxygenase genes.