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(54) Title: POLYPEPTIDES AND BIOSYNTHETIC PATHWAYS

(57) **Abstract:** Methods and compositions that can be used to make monatin from glucose, tryptophan, indole-3-lactic acid, indole-3-pyruvate, and 2-hydroxy 2-(iridol-3-ylmethyl)-4-keto glutaric acid, are provided. Methods are also disclosed for producing the indole-3-pyruvate and 2-hydroxy 2-(indol-3-ylmethyl)-4-keto glutaric acid intermediates. Compositions provided include nucleic acid molecules, polypeptides, chemical structures, and cells. Methods include *in vitro* and *in vivo* processes, and the *in vitro* methods include chemical reactions.



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