ABSTRACT

Disclosed is a method for catalytically synthesizing a single chiral 2-aryl-substituted nitrogen-containing heterocyclic derivative by means of an imine reductase, and the use thereof. The method comprises: under the catalysis of an imine reductase, converting a compound represented by formula II into a single chiral compound represented by formula I. In formulas I and II, each R is independently selected from hydrogen, fluorine, chlorine, bromine, C1-C6 alkyl, halogenated C1-C6 alkyl, C2-C6 alkenyl, C2-C6 alkynyl, cyano, nitro, or carboxyl; X is selected from -CH2- or -O-; and n is an integer selected between 0 and 5. The imine reductase is selected from any one of or a combination of at least two of the following amino acid sequences: (1) an amino acid sequence as shown in any one of SEQ ID NOs: 2, 4, 6, 8, or 10; and (2) an amino acid sequence having imine reductase activity and having at least 90% identity to the sequence as shown in any one of SEQ ID NOs: 2, 4, 6, 8, or 10.