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Purification and characterization of fluorinated ketone reductase from *Geotrichum candidum* NBRC 5767

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Among chiral compounds, enantiomerically pure alcohols are particularly useful as building blocks for the synthesis of natural products, pharmaceuticals, and agricultural chemicals. Especially, fluorinated chiral alcohols have received increased attention in recent years due to their physicochemical properties concerning biological activity, stability, and lipophilicity. So that dehydrogenases/reductases are among the most requested enzymes for the preparation of optically active compounds, for the inherent advantages in terms of their high chemo-, regio-, and enantioselectivity.

Previously, a strain of *Geotrichum candidum* NBRC 4597 that can reduce aromatic and aliphatic ketones was studied. Further study suggested that there are two classes of enzymes in *G. candidum* NBRC 4597: fluorinated and non-fluorinated ketone reductases. Acetophenone and trifluoroacetophenone were reduced to opposite configurations (Fig. 1). A similar strain, *G. candidum* NBRC 5767, also has two kinds of reductases, and because of the unique properties of the fluorinated ketone reductase (FLRD), I have deep interest in FLRD. In this study, I conducted the purification, characterization and partial gene cloning of a novel fluorinated ketone reductase from *G. candidum* NBRC 5767 and found that it specifically recognizes the ketones containing fluorines at the α position.

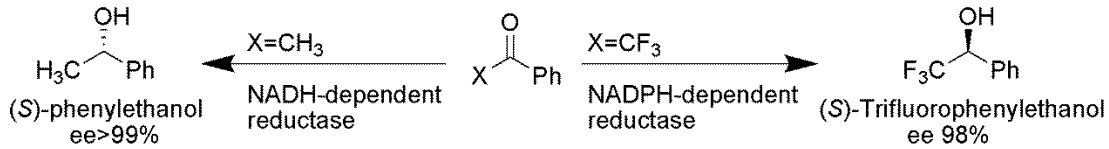

Fig. 1 Asymmetric reduction by acetone powder of *G. candidum* NBRC 4597