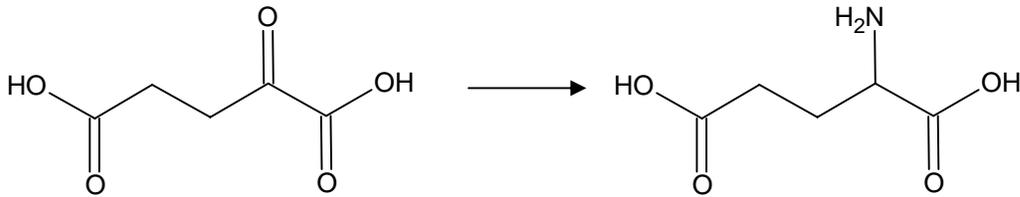


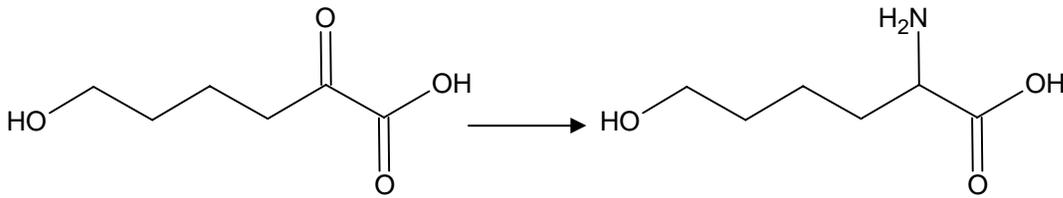
Survey of Biocatalytic Reactions

Glutamate Dehydrogenase

Natural: α -ketoglutarate \rightarrow glutamate

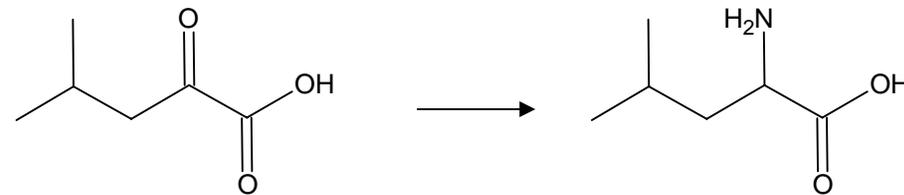


Unnatural: 2-keto-6-hydroxyhexanoic acid \rightarrow L-6-hydroxynorleucine

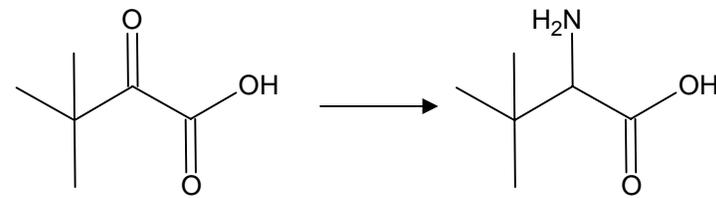


Leucine Dehydrogenase

Natural: 2-keto-4-methyl-pentanoate \rightarrow L-leucine

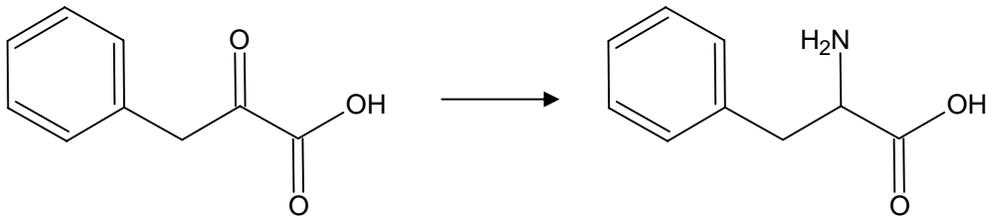


Unnatural: trimethylpyruvate \rightarrow L-tert-leucine

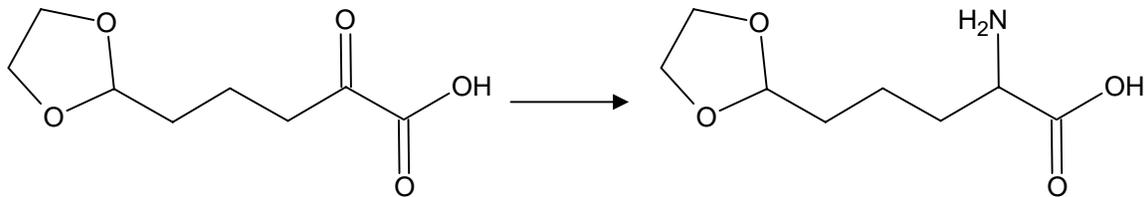


Phenylalanine dehydrogenase

Natural: phenylpyruvate \rightarrow phenylalanine

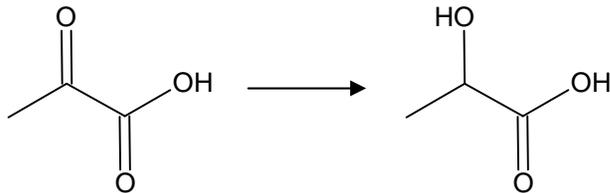


Unnatural: 5-(1,3-dioxolan-2-yl)-2-oxopentanoic acid \rightarrow 2-amino-5-(1,3-dioxolan-2-yl)pentanoic acid

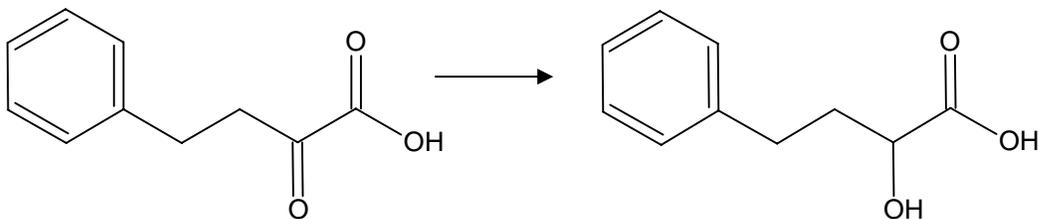


Lactate dehydrogenase

Natural: pyruvate \rightarrow lactate

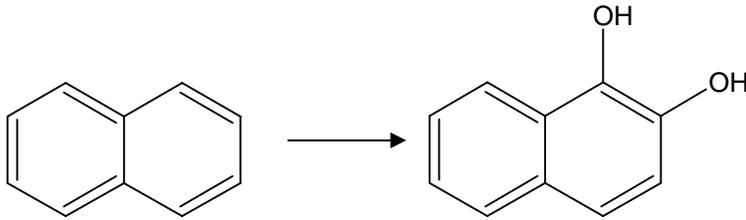


Unnatural: 2-oxo-4-phenylbutanoic acid \rightarrow 2-hydroxy-4-phenylbutanoic acid

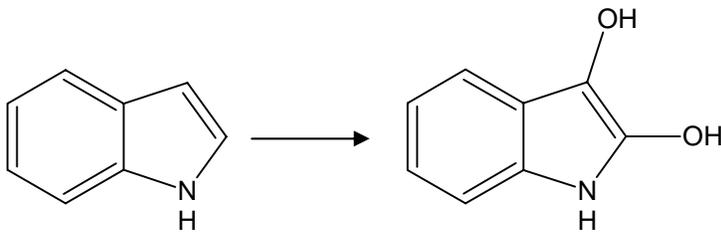


Naphthalene dioxygenase

Natural: naphthalene \rightarrow naphthalene-1,2-diol

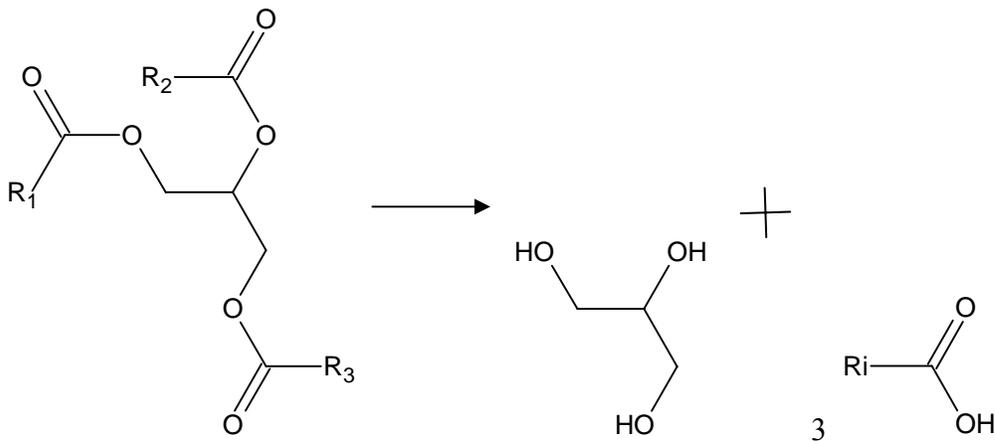


Unnatural: 1*H*-indole \rightarrow 1*H*-indole-2,3-diol



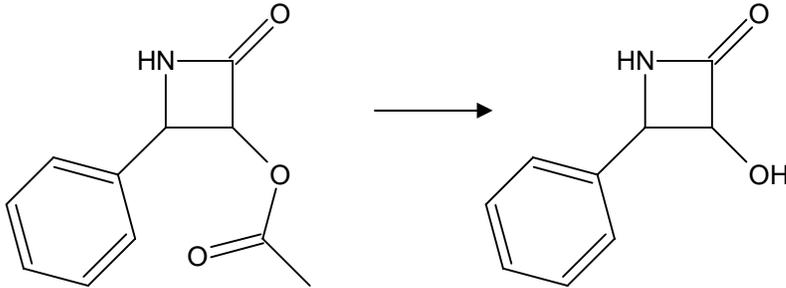
Lipases

Natural: lipid \leftrightarrow glycerol + fatty acids (Note that these enzymes are also often used in the reverse direction)

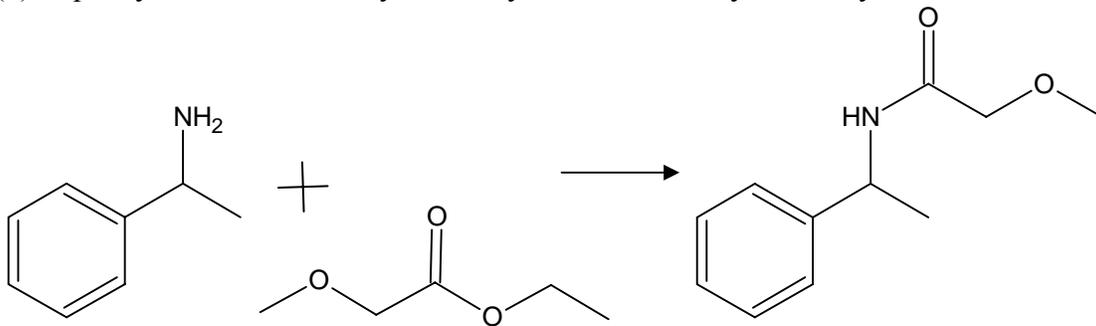


Unnatural:

(1) 2-oxo-4-phenylazetidin-3-yl acetate \rightarrow 3-hydroxy-4-phenylazetidin-2-one

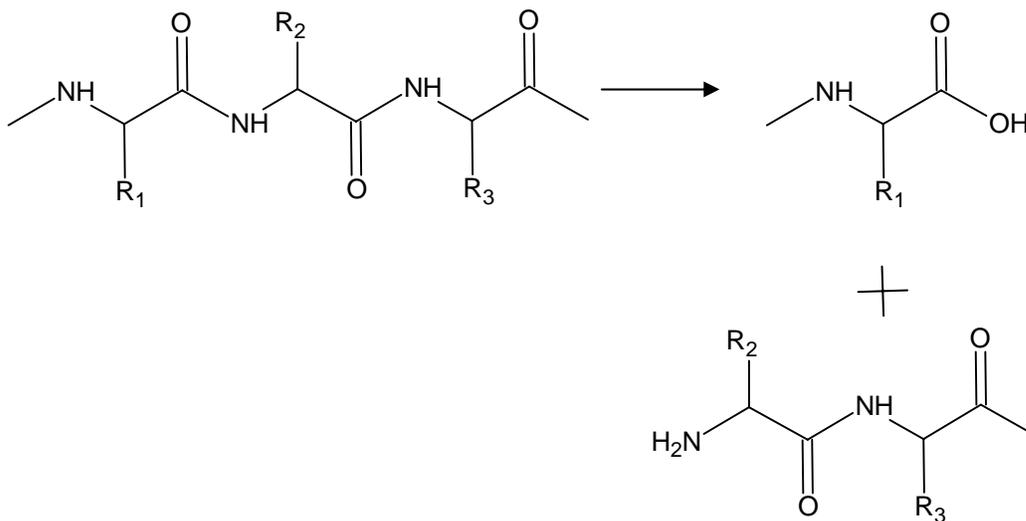


(2) 1-phenylethylamine + ethyl methoxyacetate \rightarrow ethyl methoxyacetate



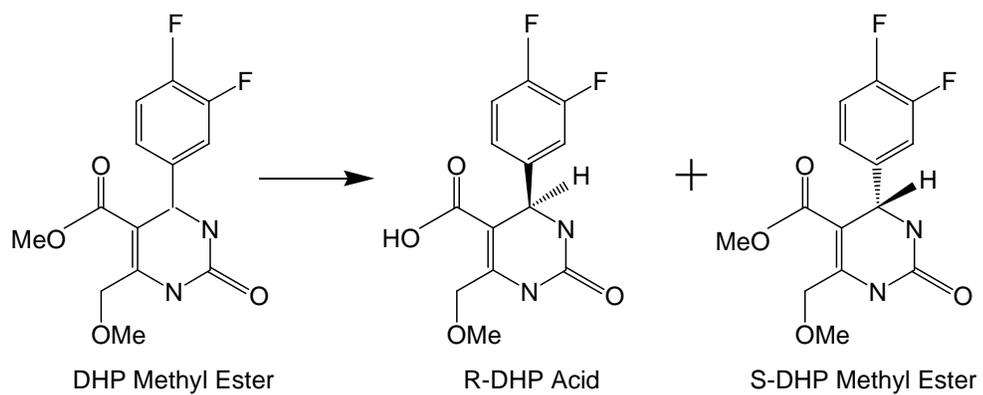
Subtilisin (protease)

Natural: peptide bond hydrolysis

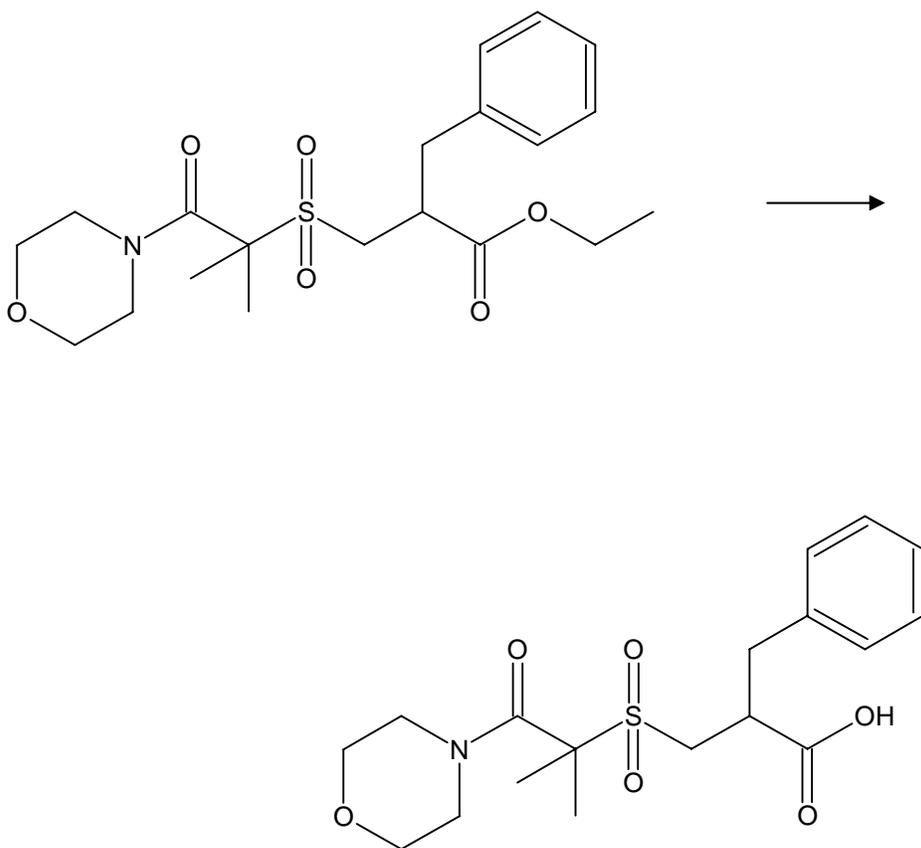


Unnatural:

(1)

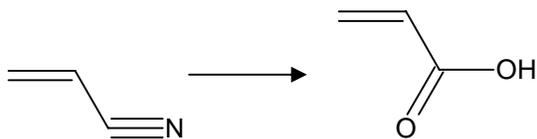


(2)



Nitrilase

Natural: acrylonitrile \rightarrow acrylic acid (acrylate)



Unnatural: pyrazine-2-carbonitrile \rightarrow pyrazine-2-carboxylic acid

