

Codex™ ERED Panels

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- Functionally diverse ERED variants *demonstrated*:
 - to accept wide range of substrates
 - to be chemical process robust (stable to organics, thermo-stable)
 - to be manufactured at commercial scale
- Combinatorial design for sequence-function analysis
- Arrayed on 96-well plates for rapid screening

Advantages to the Process Research Chemist

- Quickly determine feasibility of a biocatalytic route
- Reduce development timelines for biocatalyst optimization – competitive with chemical process optimization
- Available for in-house screening, or as service provided by Codexis
- Deliver low-cost, scalable, environmentally-friendly methods of asymmetric alkene reduction

Asymmetric Reduction of Activated C=C Bonds

Asymmetric C=C bond reductions are particularly useful for the production of chiral-at-carbon intermediates. Such reactions are usually catalyzed using asymmetric transition metal catalysts. These reactions depend on the presence of highly polar conjugated functional groups (amides, acids, alcohols) and involve complex chiral ligands and metals that must be prevented from being carried forward into the pharmaceutical product. Enzymatic activated C=C reduction can provide more economical and environmentally friendly methods for production of chiral compounds containing a variety of functional groups.

Codex™ Ene Reductase (ERED) Panels: Biocatalytic Solution to Asymmetric Alkene Reduction

One method to reduce asymmetric activated C=C bonds is through the use of biocatalysts known as enone reductases (EREDs). Codexis EREDs selectively reduce alpha-beta unsaturated ketones, aldehydes, nitriles and esters. Codexis offers a set of unique, proprietary EREDs that are “pre-tuned” to accept a wide range of substrates that can perform under chemical process conditions suitable for pharmaceutical chemical manufacturing. Codex™ ERED Panel biocatalysts are coupled with an optimized cofactor recycling system and have been shown to perform at temperatures between 20°C and 50°C, at pHs between 5 and 7.5 and with a variety of solvents (IPA, THF, ACN, MTBE, nBuOAc).

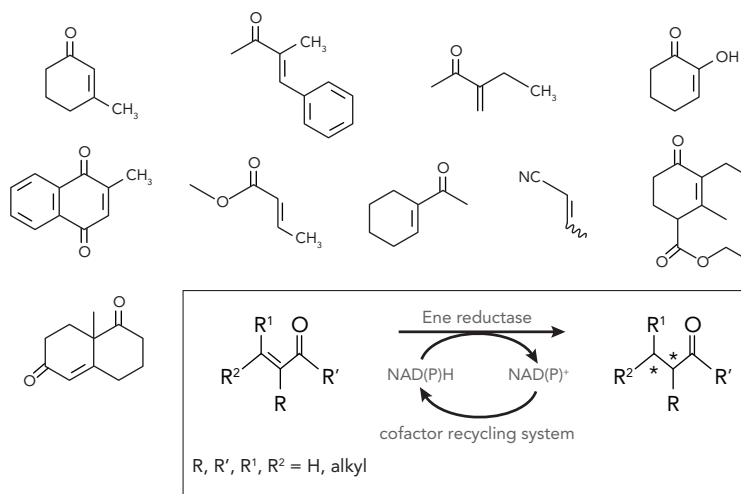


Figure 1 – Lists a number of substrates accepted by Codex™ ERED Panel biocatalysts.