

Enzyme experience Energetic delivery

The biocatalysis experts you'll enjoy working with

Maria Bohlin Analytical Chemist R&D



We're big on biocatalysis

Cambrex has developed and commercially manufactured APIs. intermediates and bulk chemicals using biocatalysis for over 15 years. As a result, our enzymes and processes are improving cost and the efficiency of manufacturing small molecules at multi-ton scale. Not just in pharmaceuticals and generics, but in everyday life - from cosmetics and fragrances to food flavorings.

Innovation

Clients from all sectors challenge us to identify enzymes suitable for the requested chemical conversions and develop the reaction ready for the integration into the complete production workflow. We respond by creating patentable know-how they can own, whilst we can operate as their reliable bulk supplier.

Adopting our technology requires no specialist equipment or knowledge, which keeps our clients' processes simple and their costs down.

Experience

Since 1999, we've grown to specialize in developing processes, designing and optimizing routes and providing R&D screening services using our proprietary library of >600 enzymes.

Our services in this area include:

- Enzyme screening
- Enzyme development
- Cloning and gene discovery
- Characterization and description of genes for different enzymes and functions
- Using different expression systems

- Process development and enzyme manufacturing
- Ability to work with different organisms and enzymes
- Process know-how for industrial enzyme production
- Process optimization and technology transfer available
- Synthetic route development and consulting
- Analytical method development

Performance

From bulk production to industrialization, our specialists offer your business more benefits:

- Shorter synthetic and alternate routes
- Reagents and solvents are biodegradable
- Typical side reactions are avoided, meaning few by-products and impurities
- High conversion, yield and enantiomeric excess
- Low enzyme and negligible cofactor costs
- Biocatalyst experts you'll enjoy working with

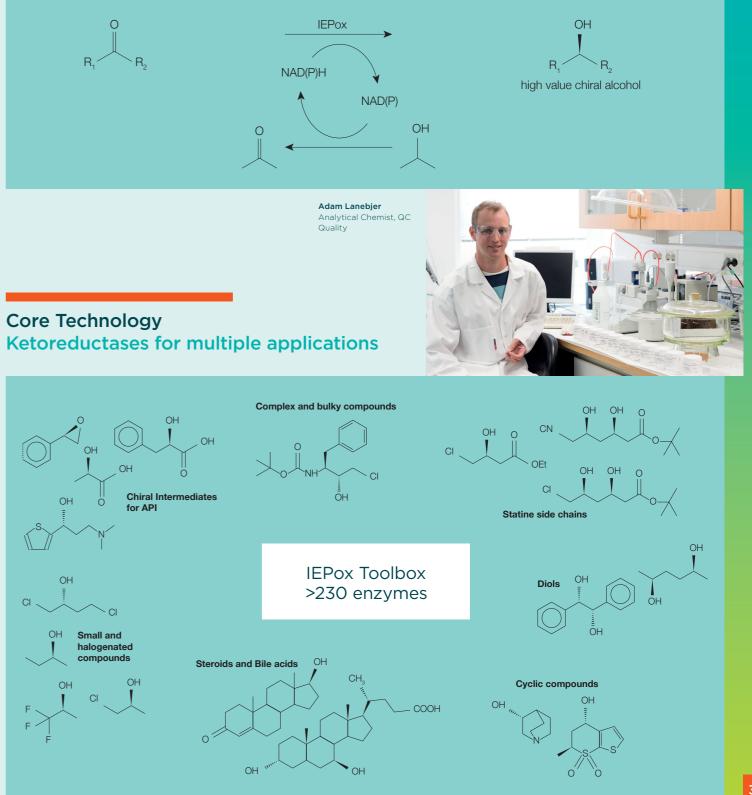
Read on to learn more about the conversions and reaction parameters Cambrex can achieve for you...

Core Technology Ketoreductases (>230 enzymes)

- Substrate load 100-400g/l
- Simple technology and equipment/ standard batch reaction
- Inexpensive enzymes for R and S alcohols available in any scale
- Excellent enantio purity (>99.8%)
- in 6-12 hours



Core Technology



• Complete and quick conversion

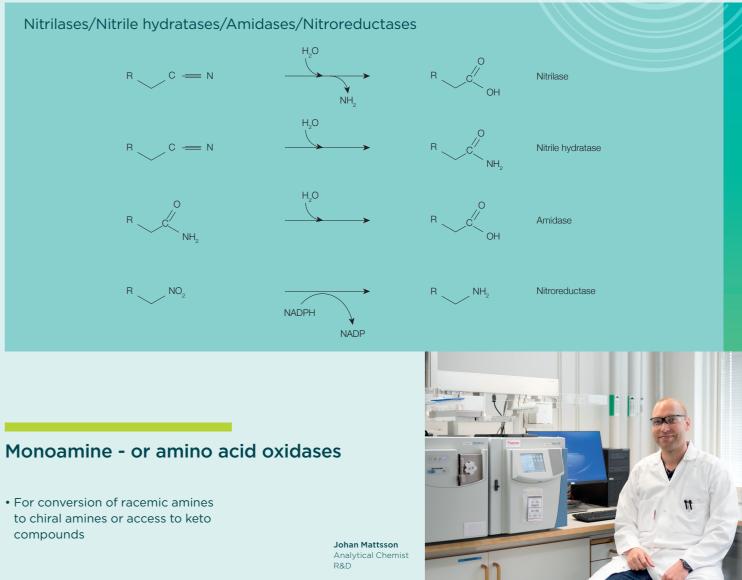
- Cost contribution of coenzyme NAD(P) <1€/kg product
- No expensive ingredients or solvents
- Easy work up and removal of enzyme
- Environmentally friendly

Core Technology Transaminases (>100 enzymes)

- Substrate load 50-150g/l
- Simple technology and equipment/ standard batch reaction
- Inexpensive enzymes for R and S amines available in any scale
- Excellent enantio purity (>99.8%)
- >90% conversion in 6-12 hours • No expensive ingredients
- or solvents

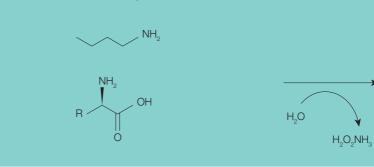
- Easy work up and removal of enzyme
- Environmentally friendly

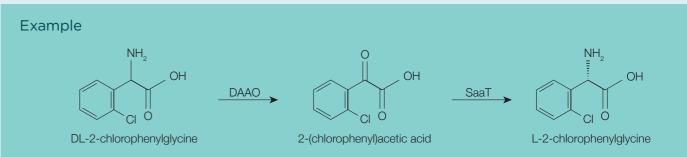
Special Biotransformations



• For conversion of racemic amines to chiral amines or access to keto compounds

Amino acid oxidase/Monoamine oxidase



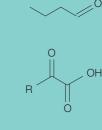




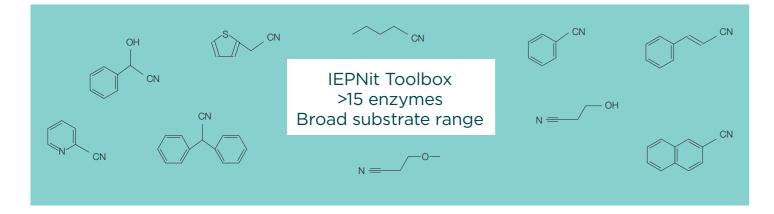






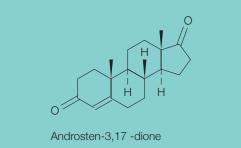


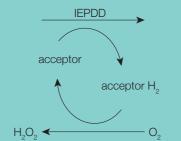
Nitrilases

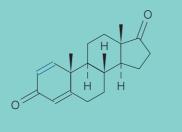


Delta1/Delta4 Dehydrogenation

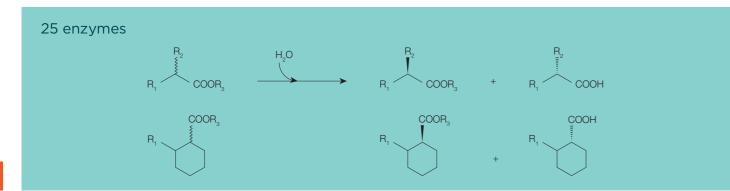
- Substrate concentration 50 up to 120g/l
- Simple technology and equipment
- Inexpensive enzyme, recombinant over-expressed (<10€/kg product)
- >95% conversion in 24 hours • Cost contribution of co-enzyme
- <5€/kg product • No expensive ingredients or solvents
- Easy work up and removal of enzyme
- Environmentally friendly





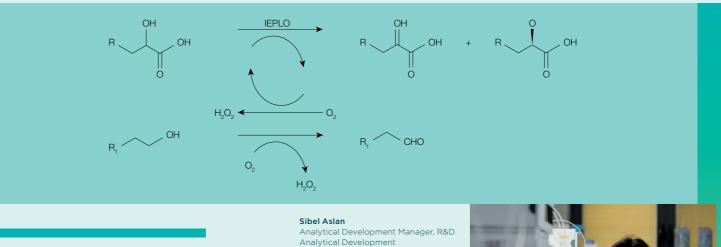


Esterases/Lipases and Hydrolases



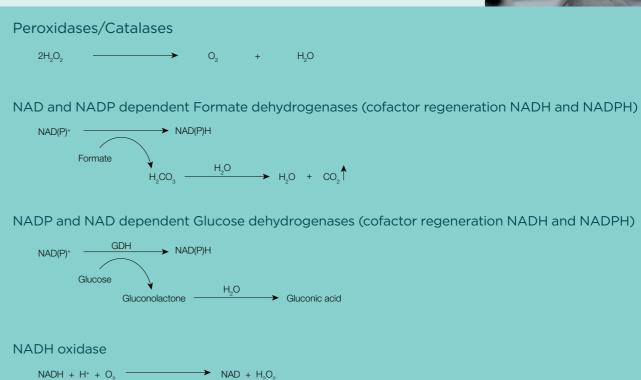
Oxidases

- Substrate concentration 100g/l
- Simple technology and equipment
- Inexpensive enzymes, recombinant over-expressed
- More than 95% conversion in 24 hours
- No additional acceptor required • No expensive ingredients
- or solvents



And many others

- Lactate oxidases
- Glycolate oxidases
- Azoreductases
- Halohydrin dehalogenases
- Aldolases (N-Acetylneuraminic acid lyase)
- ENE-Reductases



- Easy work up and removal of enzyme
- Environmentally friendly



Contact Cambrex

Experts you'll enjoy working with **www.cambrex.com**