

# Syncore Laboratories

**[www.syncorelabs.com](http://www.syncorelabs.com)**

*Efficient Technology, Customer-Oriented Service, High Quality Products*

# Outline

- Company Introduction
- Chemistry Expertise
- Biotransformation Expertise
- Our Clients and Partners
- Summary

# Introduction

- Company founding: 12/2006 (chiral tech. division)
- Founders: ex-CEOs of prestigious CMO and CRO
- Funding (as of 08/2008): \$4.0M
- R&D headquarter: Nanhui Industrial Park,  
Shanghai, China
- Total R&D facility: 3000 m<sup>2</sup>
- Key employees: 44 (as of 08/2008)

# Mission

*To enable our customers to accelerate their drug discovery & development process with efficient technologies, novel products and customer-oriented services.*

# Key Equipments

## *Chemistry:*

- 400MHz NMR
- LC-MS
- Chiral HPLC
- GC
- Kilo lab
- CMO (3<sup>rd</sup> party)

## *Biology:*

- HT screening
- PCRs
- Fermentors
- Lyophilizer
- Homogenizer
- Enzyme Production

# Services

- Chiral synthesis
  - Drug scaffold design
  - Synthetic route redesign
  - Process development
  - Biocatalyst development
  - Biotransformation screening
  - Enzyme production & formulation
  - Biocatalytic route development
- 
- MedChem & FTE projects
  - Custom synthesis & Kilo lab
  - CMO (3<sup>rd</sup> party)

# Commitment

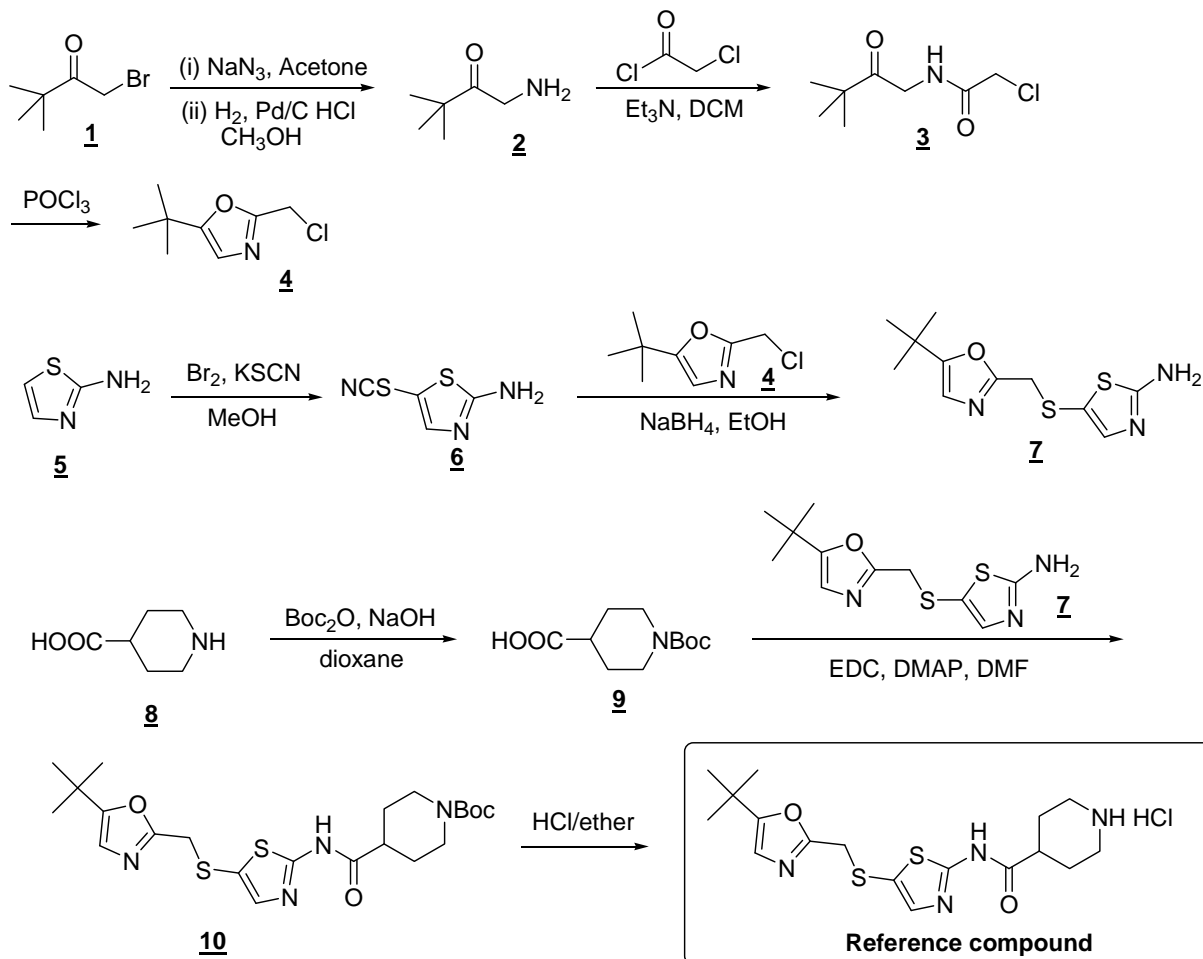
## *Guaranteed Customer Satisfaction*

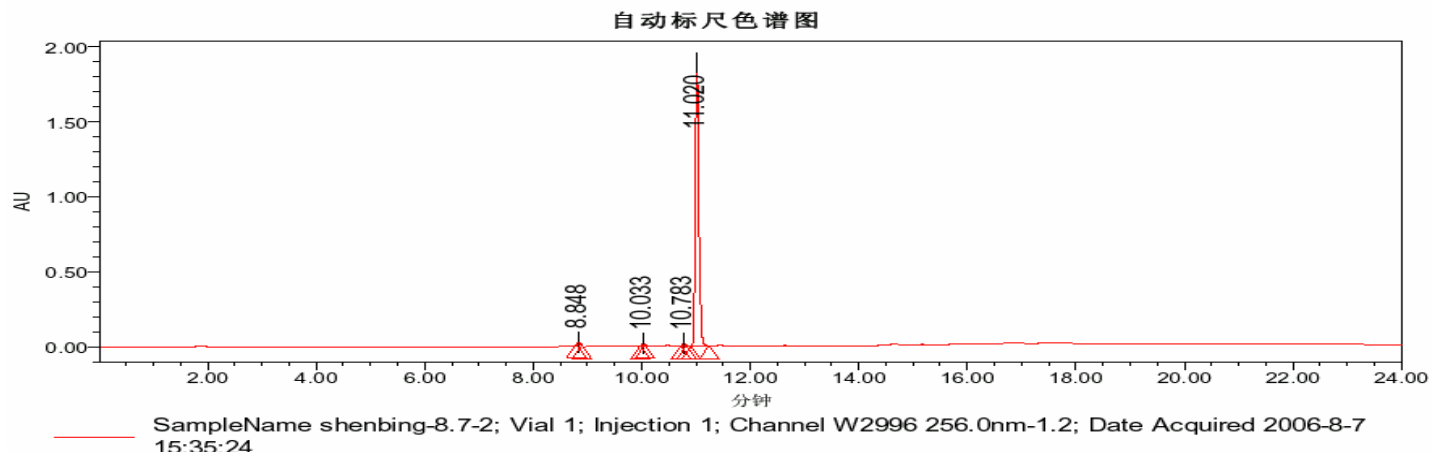
- Safeguard customers IP
- Communicate well with customers
- Make unique contributions in executing projects
- Deliver projects on-time

# Chemistry Expertise

- Chiral synthesis of building blocks and bulk intermediates
- Design of novel drug scaffolds
- Multi-step synthesis, Oxidations, Reductions, Aldol
- Claisen, Stobbe, Ugi, Buchwald, Grignard, Negishi
- Michael, Diels-Alder, Wittig, Mitsunobu, Knorr pyrazole
- Sonagashira, Suzuki, Pictet-Spengler, Staudinger

# Synthesis Example



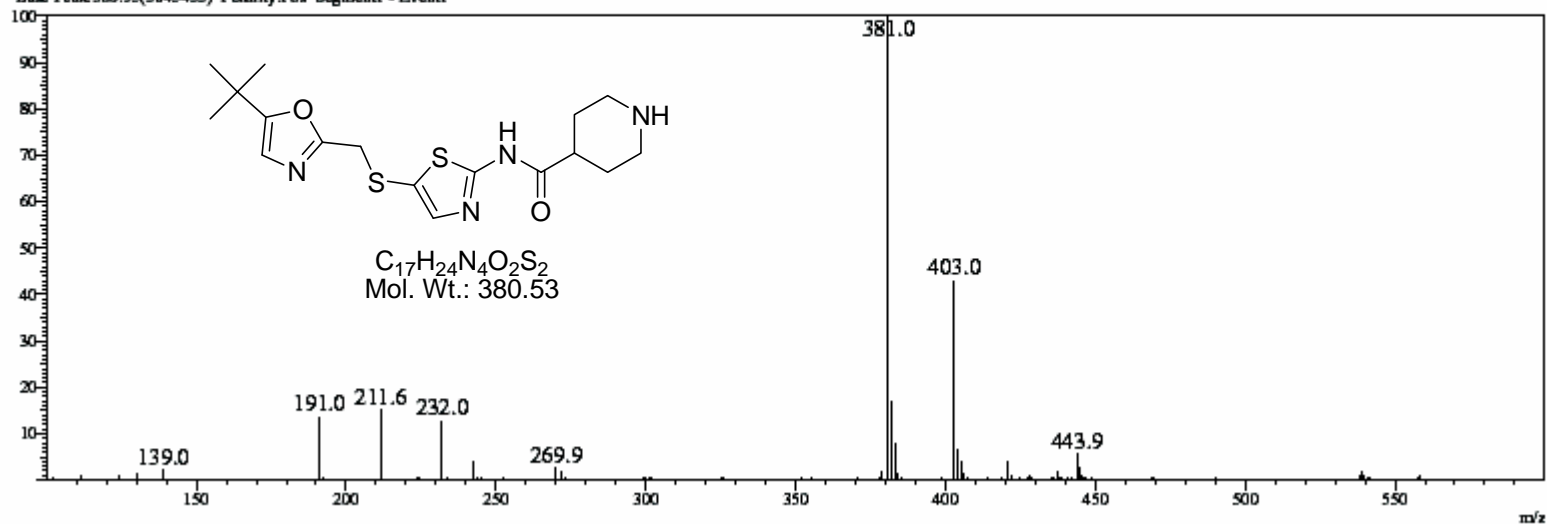


MS Spectrum Graph

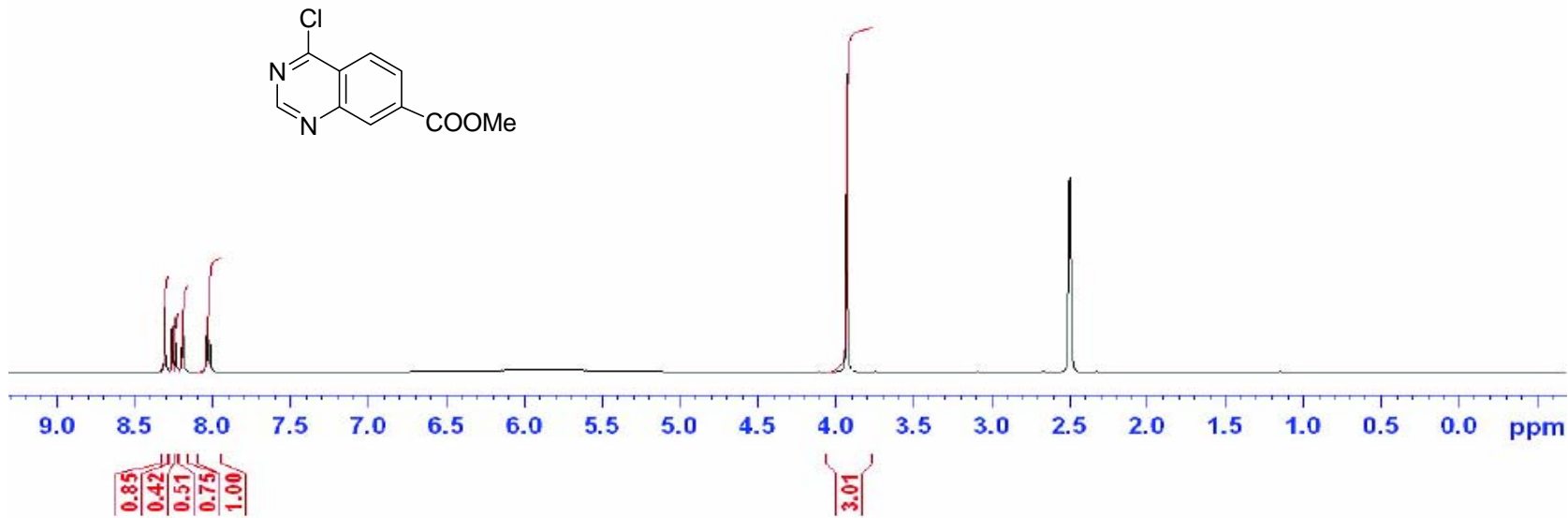
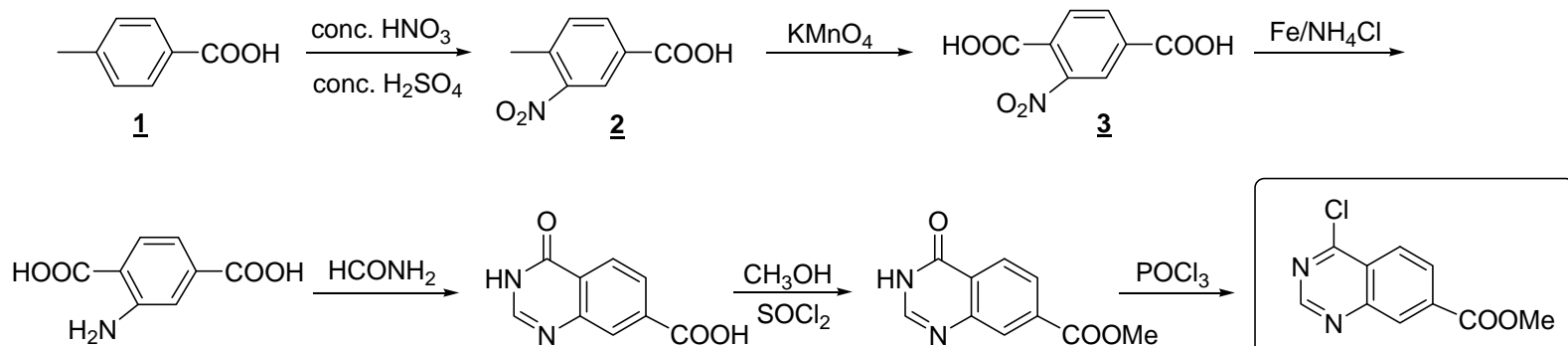
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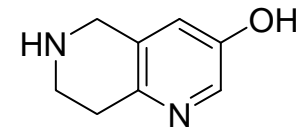
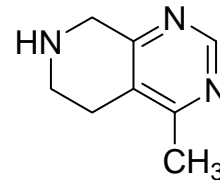
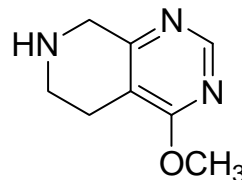
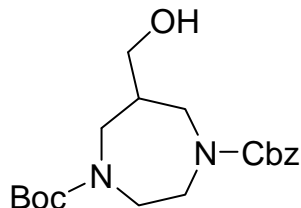
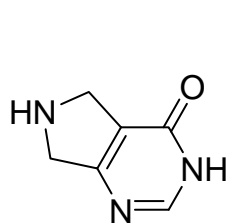
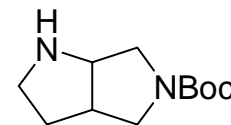
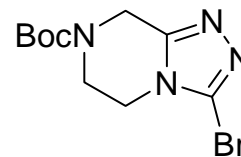
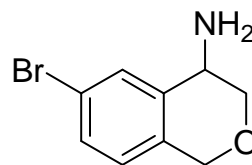
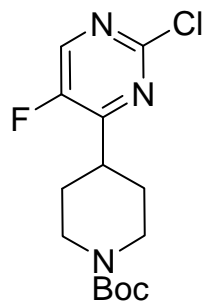
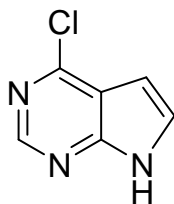
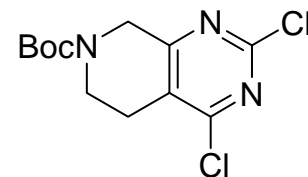
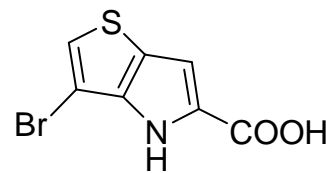
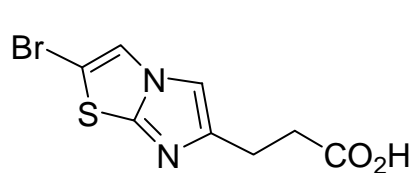
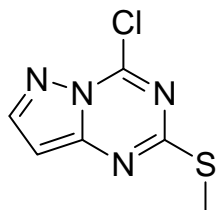
Base Peak:380.95(3845433) Polarity:Pos Segment1 - Event1



# Synthesis Example



# Scaffold Products



# Biotransformation Expertise

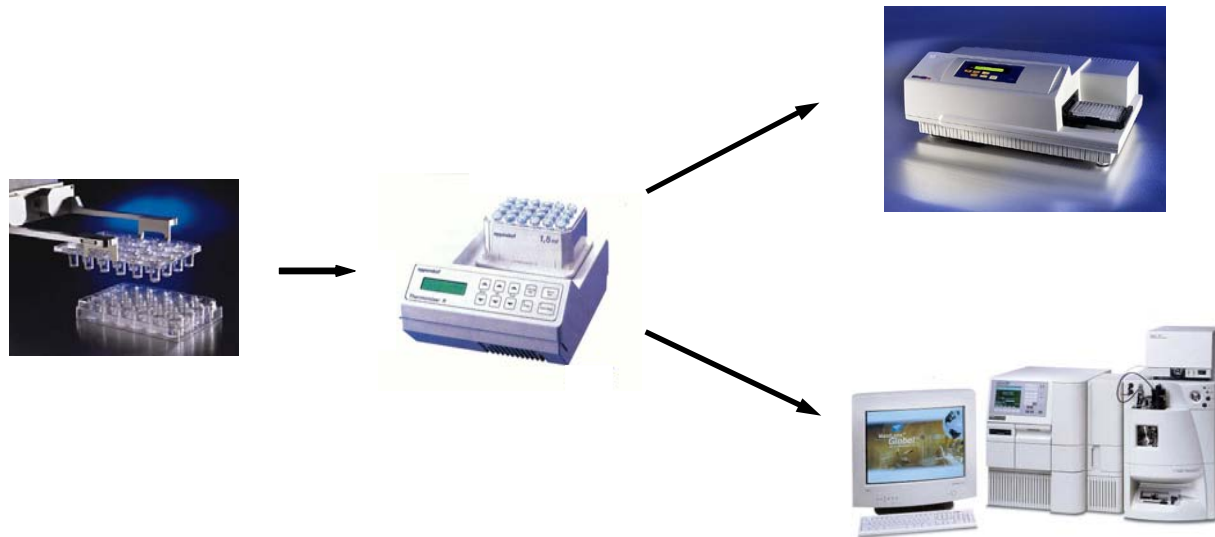
- Large(est) libraries of novel/proprietary enzymes
- Biocatalysts discovery through genomes and metagenomics
- Enzyme engineering and directed evolution
- Biocatalysts production from g to >kg
- Fermentation capability: L to >100L
- Deep experience in development of biocatalytic processes

# Novel/Proprietary Biocatalysts

- ❖ Amidases
- ❖ Ene reductases
- ❖ Ketoreductases
- ❖ Nitrilases
- ❖ Nitrile hydratases
- ❖ Oxynitrilases (HNLs)
- ❖ Proteases
- ❖ Transaminases
- ❖ Nitroreductases
- ❖ Alcohol oxidases
- ❖ P450s
- ❖ Lipases
- ❖ Amine oxidases
- ❖ Aldolases
- ❖ Epoxide hydrolases
- ❖ Monooxygenases
- ❖ Nitrile reductases
- ❖ Glycosidases

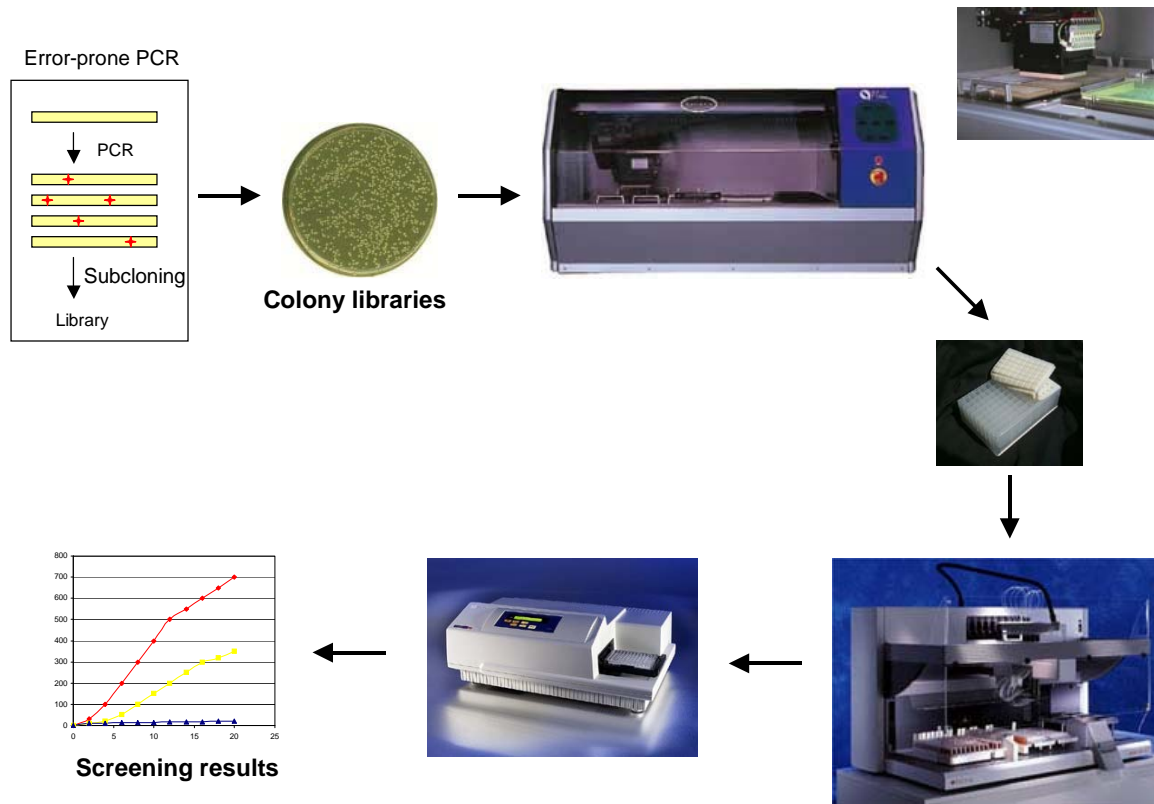
➤ *Available from catalogs at industrial scale*

# Automated Enzyme Screening

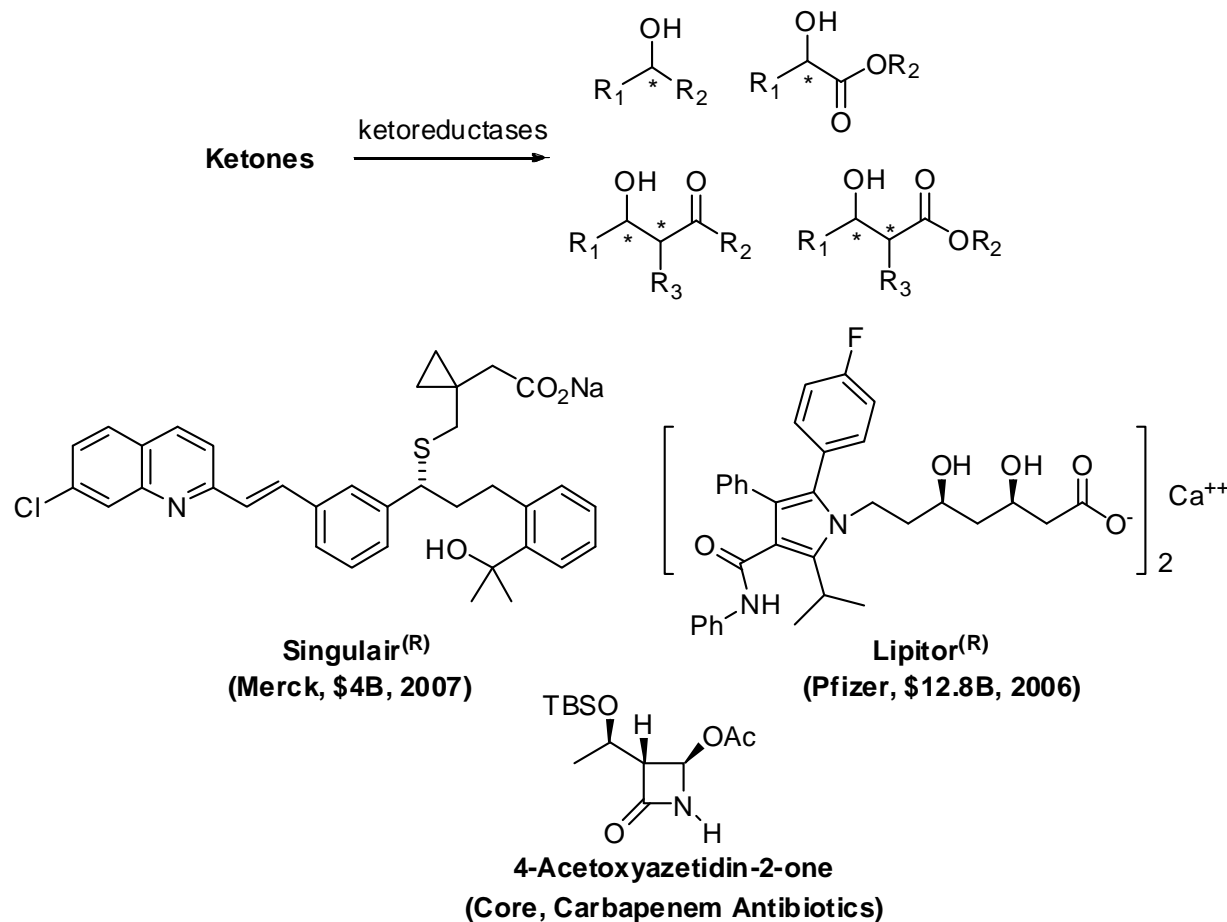


- All enzymes on 96-well plates
- Automated micro titer-based screening
- Significantly high success rates
- Ideal for good reaction control and optimization
- 2-4 Weeks from screening to preliminary lead optimization

# Enzyme Improvement by Directed Evolution

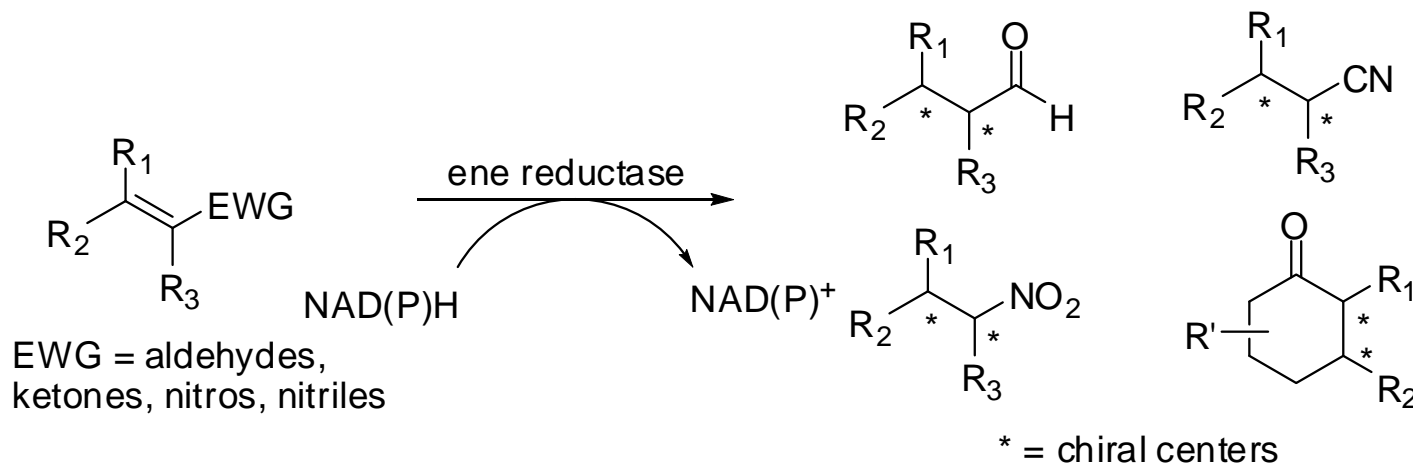


# Syncore Chiral Alcohol Technology



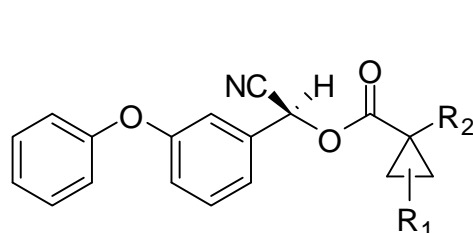
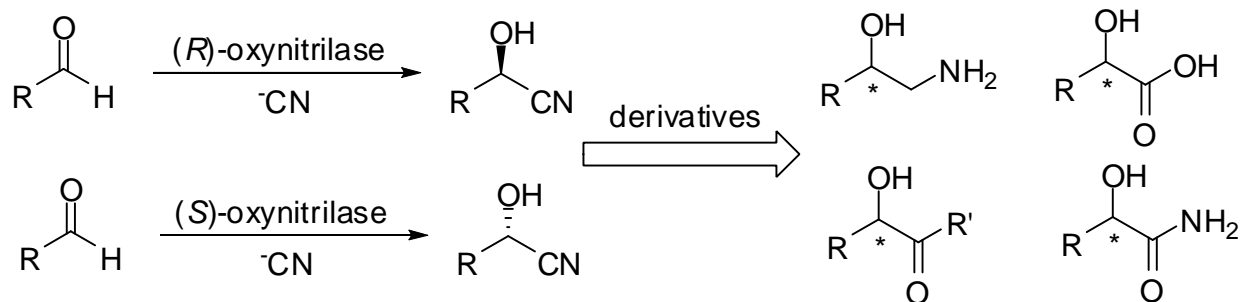
- ~70 KREDs discovered with broad substrate spectrum
- No toxic metals or high pressure required

# Syncore Technology for Asymmetric “Hydrogenation”

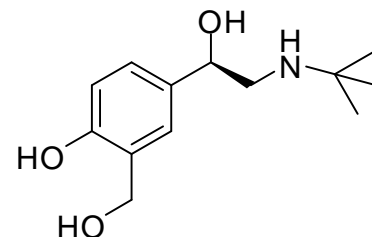


- >30 EREDs discovered with broad substrate spectrum
- **The largest library commercially available**
- Generation of up to two chiral centers in one double bond reduction
- “Equivalent” of asymmetric hydrogenation
- **No toxic metals and high pressure required**

# Syncore Technology for Chiral Cyanohydrins



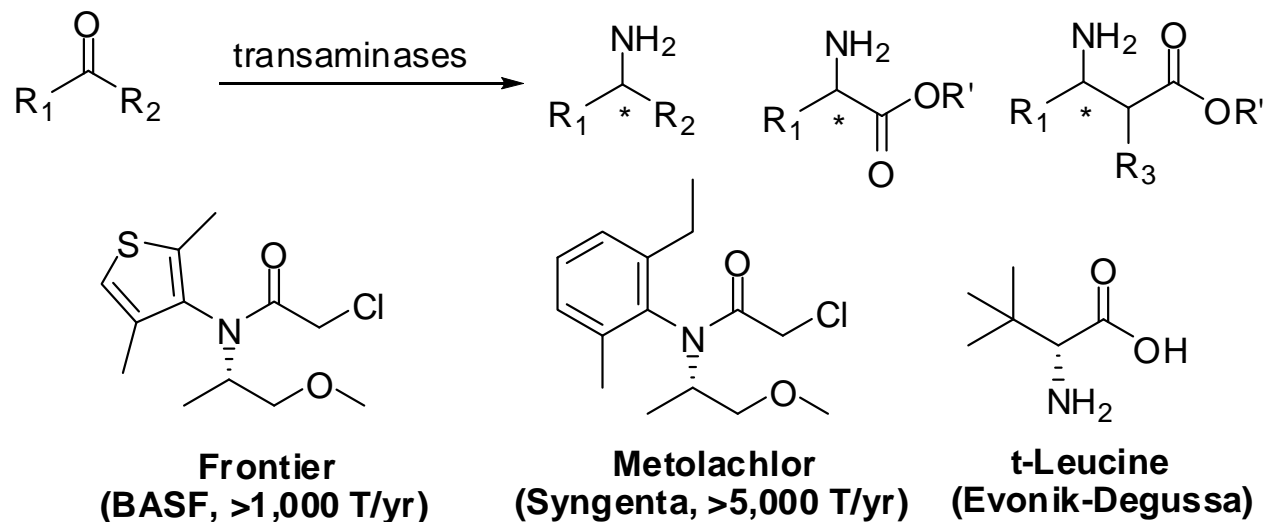
**Synthetic Pyrethroids**  
 (insecticides, >5,000 T/yr)



**Albuterol**  
 (Asthma, Generic, \$200M, 2007)

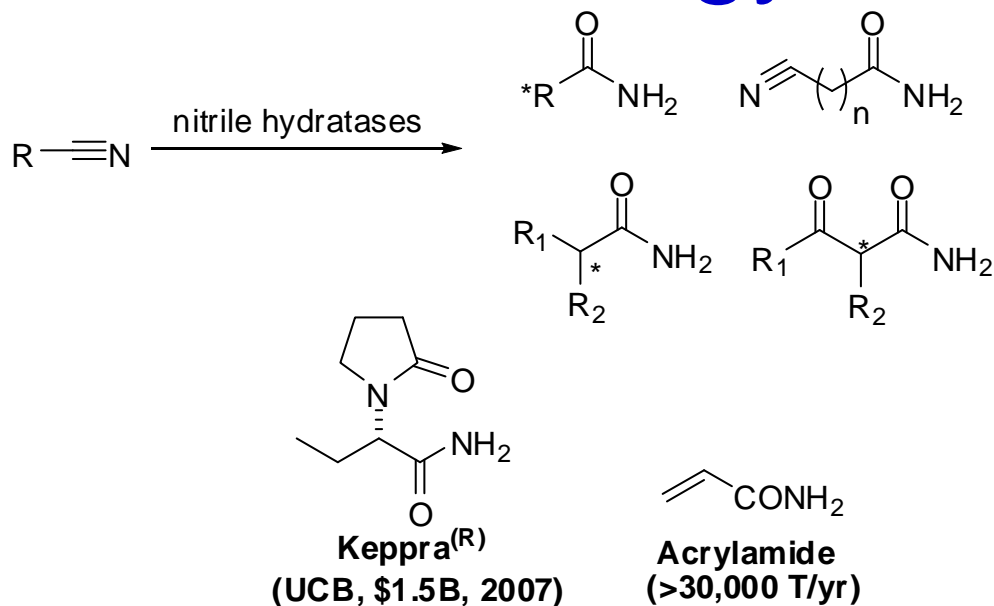
- About 30 HNLs discovered with broad substrate spectrum
- ***The largest library commercially available***
- Preparation of chiral cyanohydrins and their derivatives
- Demonstrated at industrial scale

# Syncore Chiral Amine Technology



- >20 ATAs discovered with broad substrate spectrum
- **The largest library commercially available**
- Direct synthesis of chiral amines and amino acids
- Demonstrated at industrial scale
- **No equivalent chemical transformations exist**

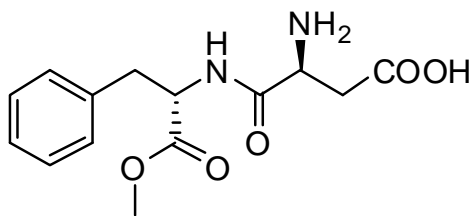
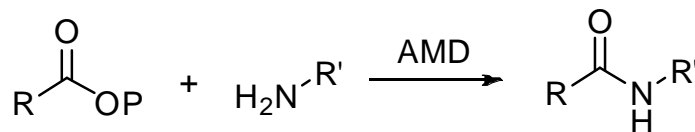
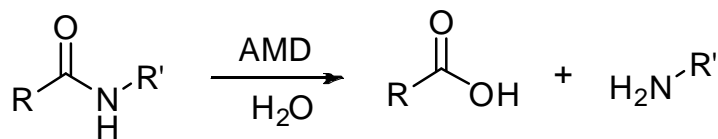
# Syncore Nitrile Hydratase Technology



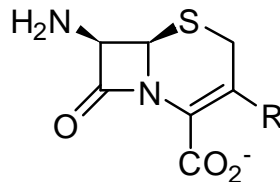
- Over 30 NHTs discovered with broad substrate spectrum
- ***Only library commercially available in the world***
- Preparation of chiral amides or nitriles or their derivatives
- Mild conditions, high selectivity and “green chemistry”
- Demonstrated at industrial scale



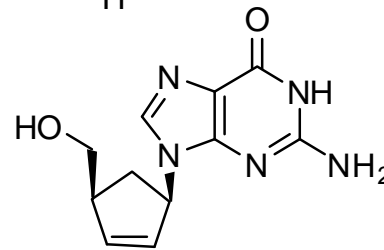
# Enzymatic Amide Hydrolysis & Formation



**Aspartame**  
(10,000T/Yr)



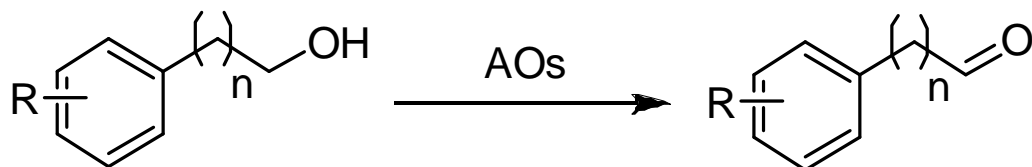
**7-ADCA**  
(Core, Antibiotics)



**Carbovir**  
(Antiviral)

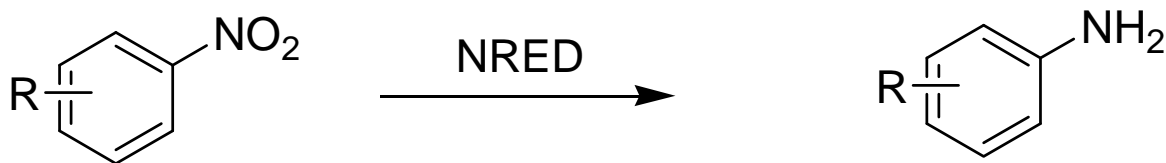
- >20 Novel amide forming enzymes developed
- **Only library commercially available**
- Tolerant of most functional groups
- Chiral synthesis or hydrolysis of amides

# Enzymatic Oxidation of Alcohols



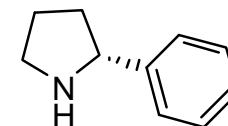
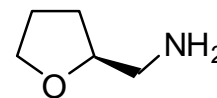
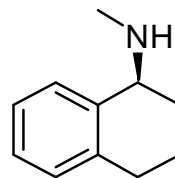
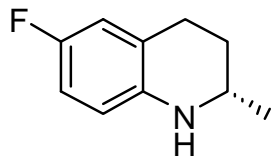
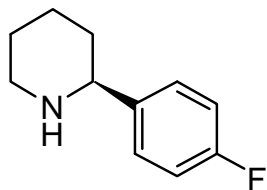
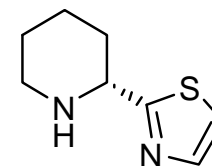
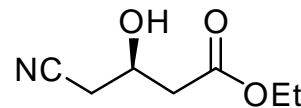
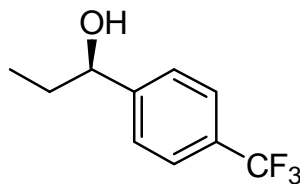
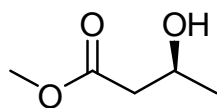
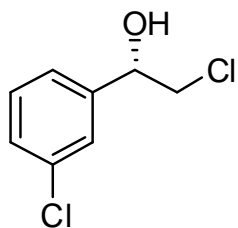
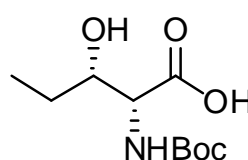
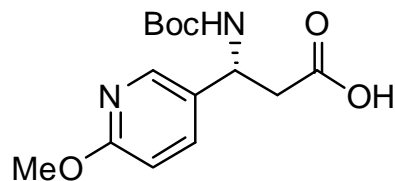
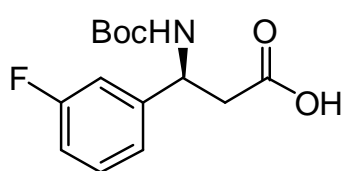
- >10 alcohol oxidases developed
- **The largest library commercially available**
- Green oxidation of aromatic alcohols to aldehydes

# Syncore Technology for Green Reduction of Nitro Compounds



- >15 NREDs discovered
- **Only library commercially available**
- Green reduction of aromatic nitro compounds

# Chiral Products



# Business Model

(A novel PST model)

*Products: Catalog or Customary*

Scaffolds, Chiral building blocks, Compound libraries, API intermediates, and Biocatalysts

*Services: Fee for Service*

Medchem, Custom synthesis, Process R&D, Biotransformations, Enzyme production

*Technology Licensing: IP transfer*

Biocatalysts, Chiral transformation platforms

# Selected Customer List



Bristol-Myers Squibb

**Lonza**



Bayer



**EVONIK**  
INDUSTRIES

degussa.



**TEVA**

 **Mylan**<sup>®</sup>



**DSM** 

 **Biocon**

# Summary: Integrated Chemical and Biological Transformation Platforms

- Strong technology platforms
- Strict IP Protection
- High Quality Service
- Cost efficient
- On-time Delivery



**Thank you!**

***[www.syncorelabs.com](http://www.syncorelabs.com)***  
***[services@syncorelabs.com](mailto:services@syncorelabs.com)***