

## AT2 LIPASE

### TECHNOLOGY DESCRIPTION

This technology is a cold-active and solvent stable enzyme which can be used in detergent manufacturing, pharmaceutical, cosmetics and food & beverages.

### TECHNOLOGY FEATURES

This technology is able to produce high quality products value added benefits. The solvent stable lipase produces catalysis of chemical reactions in non-aqueous media. It favours synthesis reactions over hydrolysis by increasing solubility of hydrophobic substrates. It also able to eliminate microbial contamination. Cold active lipase produced from the technology is suitable for chemical reactions at low temperature. This type of lipase also applicable for reactions which is using heat sensitive substrates. During the process, energy consumption and loss of volatile compounds are reduced.

### ADVANTAGES

- Thermo stable
- Increase solubility of hydrophobic substrate
- Eliminate microbial contamination
- Prevent the lost of volatile compound
  - Reduce energy consumption
  - Cost effective
  - Produces high quality of product
  - Green technology

### INDUSTRY OVERVIEW

**Prospects: Detergent Manufacturers, Pharmaceuticals Companies, Cosmetic Vendors, Food and Beverages Producers**

The global industrial enzyme market valued at USD4.41 million in 2013 and is expected to increase to USD7.65 million by 2020, growing at a CAGR of 8.3% from 2014 to 2020. As compared to other categories in industrial enzyme market, the market for lipase is stagnant, holding less than 5% of the total enzyme market. In terms of application,

detergent gain the largest global lipase market in 2012 (41%) followed by sweeteners and dairy products (21% and 17% respectively). From regional perspective, North America was the largest regional market for enzymes with market revenue of USD1,648.6 million in 2013. However, the fastest growth is expected to be continuing in Asia Pacific at an estimated CAGR of 9.4% from 2014 to 2020. The current global enzyme market is still dominated by Novozymes and DuPont (Genencor) which are also the main contributors and major enzyme players for detergents. Although lipase took only less than 5% of the enzyme market, this share has the potential to increase dramatically via a wide range of different applications.



**Prof. Dr. Raja Noor Zaliha Raja Abd. Rahman**  
 Faculty of Biotechnology and Biomolecular Sciences  
 rnzaliha@upm.edu.my