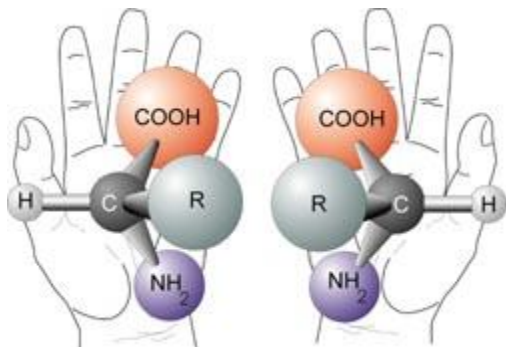


Novel Thermostable Biocatalyst



Source:

<http://microbewiki.kenyon.edu/images/thumb/9/98/Chirality.jpg/>

Reference

8810-7248

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Patent status

U.S. Issued Patent

Stage of development

Lab scale proof of concept completed,
seeking a partner for scale up and
licensing

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Background

The global market value for the chemical industry has been expanding in recent years. One of the major reasons for such market expansion is a rising demand for chiral compounds. In 2008, the European market for chiral compound manufacturing was estimated at \$1.9 billion. However, despite the high demand for chiral compounds, productivity has been low. Currently, biosynthesis is being explored over conventional chemical synthesis to increase productivity and the ability to produce specific single enantiomer. Biosynthesis commonly exploits the reaction of Alcohol dehydrogenase (ADH). However, most ADHs are unstable at high temperature, their enzyme activities are low, and they are dependent on expensive co-factors to maintain activities. These issues are key hindrances to their practical uses.

Description of the invention

A University of Waterloo researcher has isolated a novel ADH from *Thermococcus guaymasensis* (TGADH). This microorganism produces ethanol and acetoin during glucose fermentation. Studies on this TGADH have shown that this TGADH can react on both primary alcohols (e.g. ethanol) and secondary alcohols (e.g. propanol). TGADH is stable at high temperature. It has very high enzyme activity and increases as temperature elevates (up to 95 °C). Therefore, this enzyme can be a potent biocatalyst for chiral compound synthesis in both laboratory and industrial-scale setting.

Advantages

- High specific enzymatic activity
- Stable at high-temperature
- Wide substrate specificity
- Distinct stereo-specificity
- Good solvent tolerance

Potential applications

- Chiral compound biosynthesis (industrial-scale).
- Laboratory research tool (Organic chemistry).
- Biofuel/Bioethanol production.