

Screening, cloning and characterization of enantioselective epoxide hydrolase from a marine bacterium

Young-Ok Hwang^{1,2}, Jung-Hee Woo¹, Sung Gyun Kang¹,
Myong Soo Han² and Sang-Jin Kim¹

¹Marine Biotechnology Research Centre, Korea Ocean Research & Development Institute, ²Department of Life Science, Hanyang University
TEL: +82-31-400-6294, FAX: +82-31-406-2495

Enantioselective synthesis or hydrolysis is getting much more attention due to current concerns about mixed chirality of a lot of chemical, pesticides and medicine. To screen strains producing an epoxide hydrolase (EH) which hydrolyzes (*R*) or (*S*)-epoxide preferentially, 120 strains isolated from a variety of marine environments primarily by the capability of living on styrene oxide were tested for EH activity using spectrophotometric assay. Among those, one strain (JCS 358) was selected by enantioselective hydrolysis of styrene oxide, confirmed by gas chromatography. The enantioselective EH gene was cloned from screening PCR of the isolate, and overexpressed heterologously in *E. coli* using pET 24a (+) driven vector system. The protein was purified using His-tag affinity chromatography, and the purified protein was further characterized in terms of enantioselective hydrolyzing activity. This study presents a first example which discovered an enantioselective epoxide hydrolase from marine environment successfully.

[Supported by grant from the Marine & Extreme Genome Research center Program and the Marine Novel Bioactive Development Program, Ministry of Marine Affairs & Fisheries]

References

1. Nicole A.E. Kronenburg, Jan A.M. de Bont. Effect of detergents on specific activity and enantioselectivity of the epoxide hydrolase from *Rhodotorula glutinis*, (2001), *Enzyme and Microbial Technology*, 28, 210-217.

2. Adriana L. Botes, Jeanette Lotter, Owen H.J. Rhode, Alfred Both, Interspecies differences in the enantioselectivity of epoxide hydrolases in *Cryptococcus laurentii* (Kufferath) C.E Skinner and *Cryptococcus podzolicus* (Bab, Jeva & Reshtova) Golubev, (2005), *Systematic and Applied Microbiology*, 28, 27-33.