

One-step optical resolution of amino acid by preferential crystallization combined with enzymatic racemization

Koichi Igarashi<sup>†</sup>, Tomono Fujimura  
Osaka City University  
(igarashi@osaka-cu.ac.jp<sup>†</sup>)

Many of the pharmaceutical compounds have asymmetric carbon. There is a need for techniques to reliably obtain one enantiomer. One of the methods of optical resolution is a preferential crystallization. In the preferential crystallization, crystals with high purity can be obtained by a simple operation. However, if chiral molecules do not racemize in solution, the maximum yield is 50%. By racemizing the chiral molecule in solution, other enantiomers can be converted to opposite enantiomer and crystallized as the desired product. So, the maximum yield would be 100%. In this study, the enzymatic reaction by racemase was employed for racemization. We aimed to improve yield by performing preferential crystallization of amino acids combining it with racemization by racemase. The racemase genes of original host bacteria were artificially synthesized and expressed in *E. coli*. The obtained racemase was used for cooling preferential crystallization of alanine and glutamic acid. By using enzymatic racemization, the undesired crystallization of opposite enantiomer was avoided, and the efficient chiral crystallization was realized.