

Development of functional molecules by using of peptidocalixarene libraries

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Calixarenes are useful building blocks in supramolecular chemistry. Their derivatives can be used as sophisticated molecules, such as chemical sensors and enzyme mimetics. Despite their potential use in supramolecules, desired receptors are sometimes difficult to access because of their design. On the other hand, applications of combinatorial chemistry are now widespread. In the field of molecular recognition, combinatorial libraries are powerful tool for investigation of host-guest interaction. We synthesized fluorescence-labeled calix[4]arene library substituted with peptides at the upper or lower rim. Fluorescence spectrum of the peptidocalix[4]arene, which was found in the screening of libraries against the target peptide, was dependent on the concentration of the peptide.

Selection of desired molecules is very important in the filed of combinatorial chemistry. The on-bead color assays for the combinatorial library are a very rapid screening method and can be used to easily assess qualitative binding abilities. However, many simple dyes bind certain peptides in water with significant selectivity. We developed a new labeling reagent and color assay system in water utilizing the Trinder reaction to detect binding between target molecules and library members on beads. The screening method is free of label-induced artifacts, which can cause misleading results.

Development of artificial hydrolase utilizing the screening will be also discussed.