Expression of endocellulase from C. thermocellum and P. horikoshii and employment for rational design study

백승필*, 민기하, 안태정, 기미란
고려대학교
(spack@korea.ac.kr*)

Cellulose, biopolymer composed of only glucose via beta-1,4- linkage, is the most abundant material in nature, so that many research efforts have been poured on the development of efficient cellulose-hydrolysis process. In current process, the employment of cellulase, which can catalyze the hydrolysis of crystalline cellulose, is inevitable, but the high cost of such enzymatic treatment is one of the bottle-neck to the efficient use of cellulosic materials. Protein engineering of high-active cellulase is one of the strategies for reduction of the process cost and enhancement of the cellulose-usage efficiency. So, many protein researches are focused on "natural screening" or "directed evolution" but not so many successes are achieved for obtaining the high-active cellulase. In this study, we focused on a novel rational-design approach on the basis of molecular analysis and molecular modeling using docking program. Two strategies, (1) reduction of product inhibition and (2) reduction of lignin-relevant compound, are considered. Two endocellulase models from C. thermocellum and P. horikoshii are prepared for further study.