Application of hydrogel to protein microarray and artificial cornea

고원건*
연세대학교
(wongun@yonsei.ac.kr*)

PEG hydrogels have a high equilibrium water content, which should provide rapid transport of small molecules through gels and it was demonstrated that microporosity of PEG hydrogels could be easily altered. Aqueous environment of PEG hydrogel is appropriate for encapsulation of various biomolecules such as proteins, nucleic acids and even whole cells. Furthermore, PEG hydrogel have been shown to be both biocompatible and nonfouling in complex environments. Because of these characteristics, PEG hydrogel have been evaluated for in vivo use such as implanted glucose sensor, drug delivery devices, tissue engineering and cell transplantation. In addition, photopolymerized PEG hydrogels served to both stabilize and immobilized enzyme, providing a protective environment for enzymes and inhibit degradation and fouling. Transparent nature of PEG hydrogels also makes them suitable for various detection schemes when they are used biosensing application. In this seminar, two applications of PEG-based hydrogel will be described. First, PEG hydrogel was used for protein microarray using photopatterning. Second, artificial cornea was developed using interpenetrating hydrogel networks.