多孔型PVDF薄膜固定離胺酸與己二胺用於細胞培養

This research investigate the preparation, modification, and application in the biomedical field of porous poly(vinylidene fluoride) (PVDF) membranes. PVDF membranes with different porous structures were prepared by immersion-precipitation of a casting solution in coagulation baths composed of triethylphosphate (TEP, solvent) and water (nonsolvent). SEM, DSC, XRD, and Contact Angle analyzer were used to characterize the membranes. Onto the membrane surface, an amino acid, l-lysine, and 1,6-hexanediamine were immobilized by a chemical process. First, the membrane was grafted with poly(glycidyl methacrylate) (PGMA) by means of plasma-induced free radical polymerization. Then, lysine and 1,6-hexanediamine were immobilized on the membranes by reaction of them with epoxy group of previously grafted PGMA. The highest attainable grafting yield of PGMA on PVDF membrane reached up to 0.293 mg/cmP2P. For immobilization of l-lysine and 1,6-hexanediamine on the membrane, the yields were found to depend on factors, such as reaction concentrations, reaction temperature, and pH value. The maximal attainable immobilization yields were 0.278 mg/cmP2P and 0.222 mg/cmP2P, respectively. Furthermore, neuron cells were cultured on l-lysine/PGMA/PVDF and 1,6-hexanediamine/PGMA/PVDF membranes. It was found that chemical compositions on the membrane, in particular, the carboxylic acid of l-lysine, had a marked influence on the cell activity.