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PVA/AMPS double network-based nanofiber hydrogel by electrospinning for articular cartilage**Kuk Ro Yoon**

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The aim of this study was to fabricate polyvinyl alcohol/2-acrylamido-2-methyl-1-propanesulfonic acid (PVA/AMPS) fiber-based foam gel by electro spinning method. Electro spun nanofibers had a broad range of applications in recent years, particularly for biomedical field such as drug delivery, tissue engineering, membranes/filters, sensors and so forth. PVA/AMPS double network gel was obtained, when PVA/AMPS network gel composite was irradiated with UV radiation. Double network gel had enhanced mechanical properties and tougher than the network gel. Double network gel had on cell compatibility and high mechanical strength for cell culture. Negatively charged in AMPS was induced chondrocytes cultured. This study application was cell culture medium for chondrocytes. Above prepared solutions were transferred into a plastic syringe of 20 ml with a needle inner diameter of 0.58 mm. The needle was connected to a high voltage of the positive power supply. The negative terminal was joined with the collector. The collector was placed vertically at a horizontal distance of 15 cm from the tip. During the electrospinning, the flow rate of the electrospinning solution was fixed at 0.5 ml/h and the applied voltage was 17 kV. To get nanofiber gel, UV radiation irradiation was carried out on nanofiber sheet. Schematic formation of nanofiber gel by electrospinning procedure was shown in Scheme 1. Trees can connect to accomplish this purpose. PVA/AMPS fiber sheet and double network gel properties were characterized by SEM Contact angle, FT-IR, TGA. SEM images show fiber shape and when PVA 15 wt%+AMPS 2M-MBAA 4 mol%-OA 1 mol% fiber shape was best. Contact angle images confirmed that hydrophilic increases when AMPS MBAA concentration is high. FT-IR analysis show PVA and AMPS characteristics OH, NH in 3450 cm^{-1} , 1630 cm^{-1} C=O, 1080 cm^{-1} C-O. When fiber sheet changed double network gel C=O, S=O double bond was broken, and general intensive was decreased. TGA analysis indicates double network gel thermal stability was enhanced than fiber sheet and when MBAA concentration high, double network gel thermal stability was increasing.

Biography

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