

Effect of protein layer on the photo-thermal harvesting of cell sheets

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Various protein layers with different thickness were coated on a conjugated polymer surface and explored for growth and harvesting of cell sheets by NIR photothermal method. There was a large difference in cell morphology among the different protein layers while the dependence of cell growth on the different protein layer was similar to each other. Fibroblasts showed the highest proliferation rate when cultured on the collagen surface with an optimized thickness. In this condition, the cell was adhered well indicating that the collagen-coated substrate provides the most favorable surface for cell growth than other substrates. The cells cultured on the protein coated conjugated polymer substrate was excited with an NIR laser, to examine the thermal response of the proteins on the polymer substrate. The segregation of protein layers and detachment of cell sheet area were highly dependent on the protein thickness as well as light dose. By adjusting the thickness, concentration, light dose, and polymer layers, a large area cell sheet was spontaneously harvested from the substrate within 5 min of NIR exposure. Further analysis on the proteins after NIR exposure, effect of proteins on cell behavior, and application potential of this method will be discussed in the presentation.

Biography

Jongbeom Na is Integrated Doctoral course student in Prof. Eunyoung Kim's Lab in Yonsei University. His major research area is the polymer materials with nanostructure for energy and biomedical applications.

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