عنوان مقاله:

Fabrication and experiment of hydrogel substrates with different mechanical properties to simulate body tissues and extracellular matrix

محل انتشار:

سی و یکمین همایش سالانه بین المللی مهندسی مکانیک ایران و نهمین همایش صنعت نیروگاهی ایران (سال: 1402)

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خلاصه مقاله:

Many cells in the body adhere to their extracellular matrix (ECM), and if they don't adhere, they can't survive. In addition to chemical messages and messages received from neighboring cells, the ECM and its mechanics also have an essential effect on regulating the behavior of adherent cells. The modulus of elasticity of the ECMs can also affect the behavior of the cell as an external static force. Different cells in the human body feel different modulus of elasticity of ECM. On the other hand, various cancer cells in the state of metastasis feel different modulus of elasticity in different places. The elasticity modulus has been found to have a profound effect on the behavior of cells. Fabricating matrix substrates with a defined modulus of elasticity can be a valuable technique to study the interactions of cells with their biophysical microenvironment. Matrix substrates composed of polyacrylamide hydrogels have an easily quantifiable elasticity that can be changed by adjusting the relative concentrations of its monomer, acrylamide, and crosslinker, bis-acrylamide. In this paper, we detail a protocol for fabricating polyacrylamide hydrogels. Also, with this protocol, models are made and their elastic modulus is tested with ASTM standards.

کلمات کلیدی:

extracellular matrix, Elastic modulus, polyacrylamide, Hydrogel, mechanotransduction.