Bio-ink: Evaluation of Protein as Biomaterials for 3D Bioprinting

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Three-dimensional (3D) bioprinting is one of the most promising methods of tissue engineering as it provides unprecedented versatility and precision in delivering cells and biomaterials. However, limitations still exist in the availability of bioinks with natural bio-macromolecular components. In this research, chicken albumin is evaluated as a potential bioink for direct extrusion bioprinting of hollow constructs through alginate-templated crosslinking. Channel diameter, wall thickness, and bioink feed rates are calculated to assess the printing performance of the alginate-based bioink. It is shown that an albumin-based bioink with as low as 1.33% of total alginate concentration can be employed to successfully print microfibrous hollow constructs with a uniform diameter.