Biomedical applications of Silicate Nanoplatelet-based Shear-Thinning

Hydrogel

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Every person is unique with different challenges to optimal health-from genetic predisposition to disease to socioeconomic barriers. Advances in biomaterial synthesis, microfluidics, microsurgical procedures, and microscale technologies have made minimally invasive therapeutic approach a promising tool in regenerative medicine. Minimally invasive delivery strategies can 1) minimize the damage to the tissue surrounding the injured tissue during approach, 2) lower the risk of complications, 3) result in faster recovery, and 4) show the maximum effect with a relatively small dose compared to the conventional invasive approach. In particular, the importance of minimally invasive treatment technology is being emphasized in the era of personalized medical care where the patients satisfaction after recovery is more important than ever, as well as shortening the recovery time of the patient from the disease and the effectiveness of the treatment strategy. Here, we will discuss minimally invasive treatment strategies utilizing biomaterials based on naturally derived polymers and silicate nanoplatelets. As part of this, the development of catheter-based minimally invasive embolization as well as injectable drug delivery technologies will be presented. In addition, several future prospects for this emerging sector through the integration of various technologies will be highlighted.