**International Conference on Bioengineering & Regenerative Medicine-2020**

**(Arial 12)**

**Scientific Research Area (**preferably from Thematic Areas given on Abstract page**):** ............ (Arial font 11)

**Preferred Presentation Method:** Oral/Poster

**Student Type:** B.Tech/M.Tech/M.Sc./Ph.D./Postdoctoral Scholar

**Designation:** ……………

**Citizenship:** ……………

**Country of Birth:** …………………

**Country of Residence:** …………………

**Generation of 3D printed core-shell scaffolds using biopolymers for tissue engineering application***(*Arial font 11)

**Author1(PhD) & Author2 ....... (**Arial font 10)

**School of Biochemical Engineering, IIT BHU, Varanasi-221005, India (**Arial font 10)

Tel: +91-xxxxxxxx, Email: xxxxx.bce@itbhu.ac.in (Arial font 10)

Tel: +91-xxxxxxxx, Email: xxxxxx@iitbhu.ac.in (Arial font 10)

**Abstract (Arial font 10)**

In the past decades, additive manufacturing technologies has entered the field of medical engineering due to its high potential in the production of 3D scaffolds for effective tissue regeneration. Thereby, recent approaches include printing of cell-laden hydrogels in a strand-wise layer-by layer approach achieving resolutions of a few hundred micrometers. To produce mechanically stable scaffolds with a high shape fidelity, a high hydrogel concentrations must be applied. This accompanies strong shear forces within the gel, when it is extruded through the print head and leads to generation of high shear forces. Thereby an effective technologies is required to minimize such shear effect over the viable cells while printing the cell-scaffold construct. The proposed project aims to overcome these limitations by printing core-shell structures that enable the functional separation of printing shape fidelity and mechanical stability on the one side and optimum environmental growth conditions for cells on the other side. The aim is to print structures with a mechanically stable shell that can be composed of a highly concentrated hydrogel or of a solid polymer film protecting the cell-laden soft core-hydrogel from the occurring shear forces during printing. To ensure sufficient diffusion of nutrients and metabolites into and out of the core, the shell should display a porous structure which can be generated by a porogen leaching procedure. The major goal of this project will be towards translational research by biofabrication of the core-shell scaffold using high resolution 3D printing technique.

**Keywords:** Core-shell scaffold, 3D printing, additive manufacturing, hydrogel, polymer, biofabrication, tissue regeneration (Arial font 10)