Indigenous 45S5 bioglass scaffolds were biofunctionalized using human adipose tissue-derived stem cells (hASC) seeded collagen coating. The amount of vascularization was evaluated on in vitro human umbilical vein endothelial cells formation assay, and for in vivo assay on CAM model. Angiogenesis was significantly higher in the biofunctionalized scaffolds than the fibroblast-seeded constructs and unseeded scaffolds. The study has proved the significance of Cam model as a quantitative tool on large 3D implants and the functional utility of the combining 45S5 bioglass with hASC (Handel et al., 2013).

As a foremost trial, the effect of 45S5 bioglass on arteriovenous loop AVL model was quantified. In the medial thigh of eight rats, an AVL was created interpositioning, a venous graft on the contralateral side between the femoral artery and vein. Embedding of the loop on sintered granular 45S5 glass matrix filled with fibrin gel was done. Histological and microcomputed tomography at (Adair and Montani, 2010) weeks show numerous immature blood vessel sprouts approximating the vascular axis (Arkudas et al., 2013). This type of angiogenesis would make transplantation of the construct a possibility.

Earlier studies have proved that ionic products of bioactive glasses—that is Si, Ca, and phosphate ions improvise the angiogenic potential of endothelial cells (Kong et al., 2014; Li and Chang, 2013; Hoppe et al., 2011).

This study investigated the angiogenic capability of Si ions alone. The duo delivery of Si ions and VEGF together were seemingly more effective as angiogenic stimulus in chicken CAM model (Dashyam et al., 2017).

In vitro and in vivo analysis throws light on the enhancement of proangiogenic genes-HIF1 by blocking the enzyme-PHD2, which consecutively activated the signal molecules VEGF and FGF2. In addition to activation of this pathway, the VEGF molecule triggers proangiogenesis. This finding along with the unique capability of mesoporous microsphere carriers promises its use in the **regeneration of bone tissues and therapeutics**.

When any defective or diseased structure is attempted to be substituted, the biggest challenge is the reaction of the host tissue-foreign body response. Lack of blood supply and inflammation usually causes failure of the tissue-engineered products. In rat animal models, microspheres of collagen-in-hydrogel system (Browne et al., 2015) were used to release interleukin-6siRNA (IL-6) and endothelial nitric oxide synthase (eNOS) pDNA in a slow manner. Each of these was checked at different doses, for their capability to reduce inflammation at 7 days in the form of reduced inflammatory cell volume fraction, and lengthening of blood vessels at 14 days. The best possible dose of both were administered and analyzed using Raman microspectroscopy. It showed not only reduction of inflammation and increased blood vessel formation, but the binding of growth factors-$VEGF_{165}$ and bFGF to ECM's sulfated glycosaminoglycan (sGAG), enhancing the angiogenic potential in multitudes.

Wound healing has seen an overwhelming favorable response with bioglass. Polymeric resorbable suture material coated with silver-doped bioglass (2Ag-60S) offered **bactericidal effect** (Blaker et al., 2004; Pratten et al., 2004).