

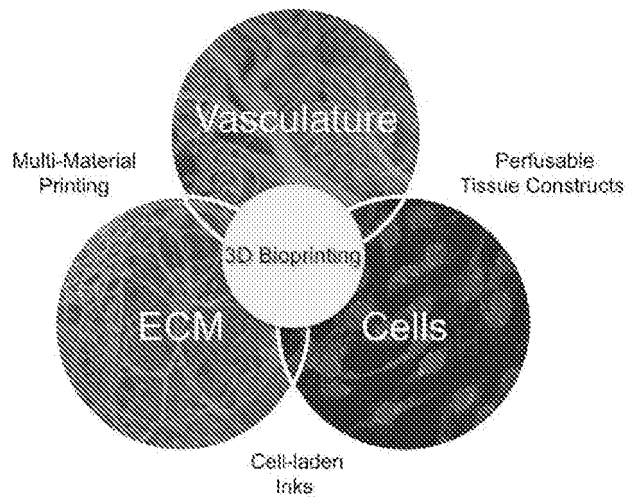


FIG. 1A

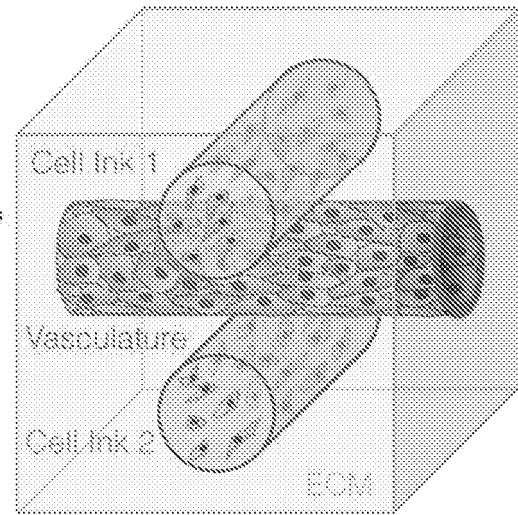


FIG. 1B

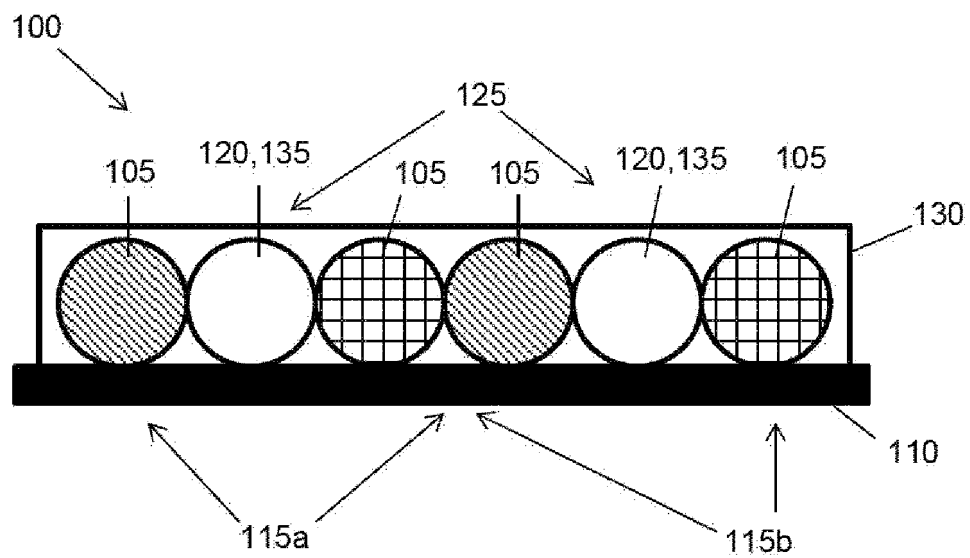


FIG. 2A

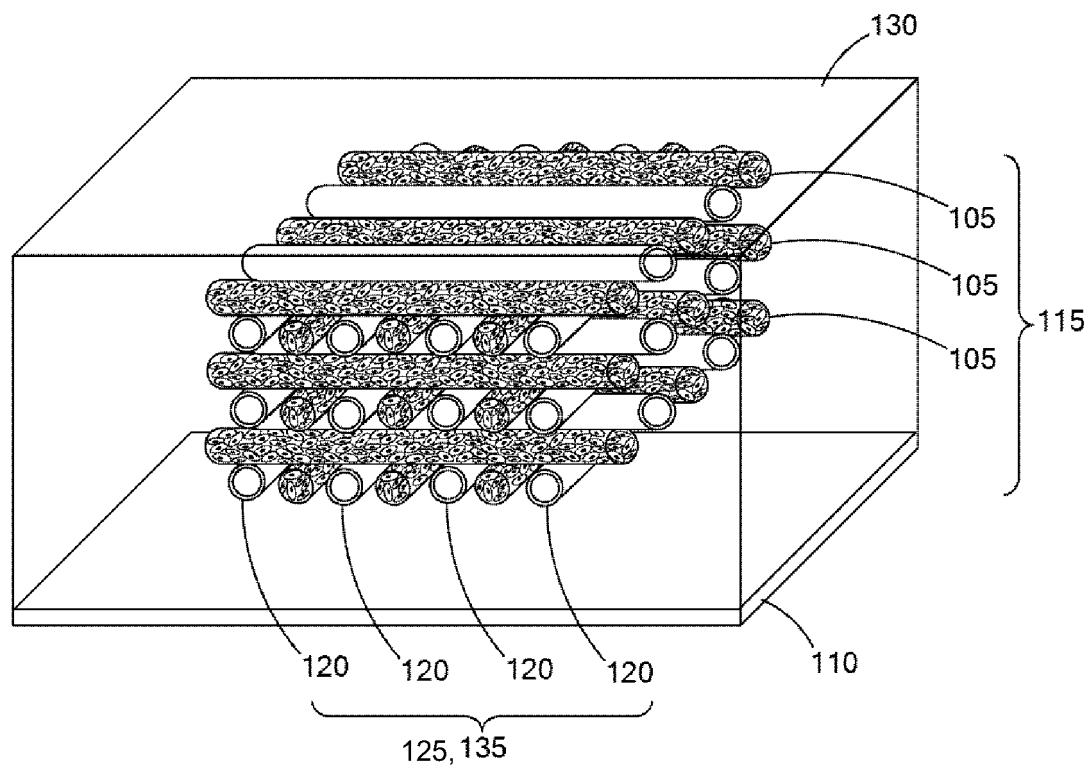


FIG. 2B

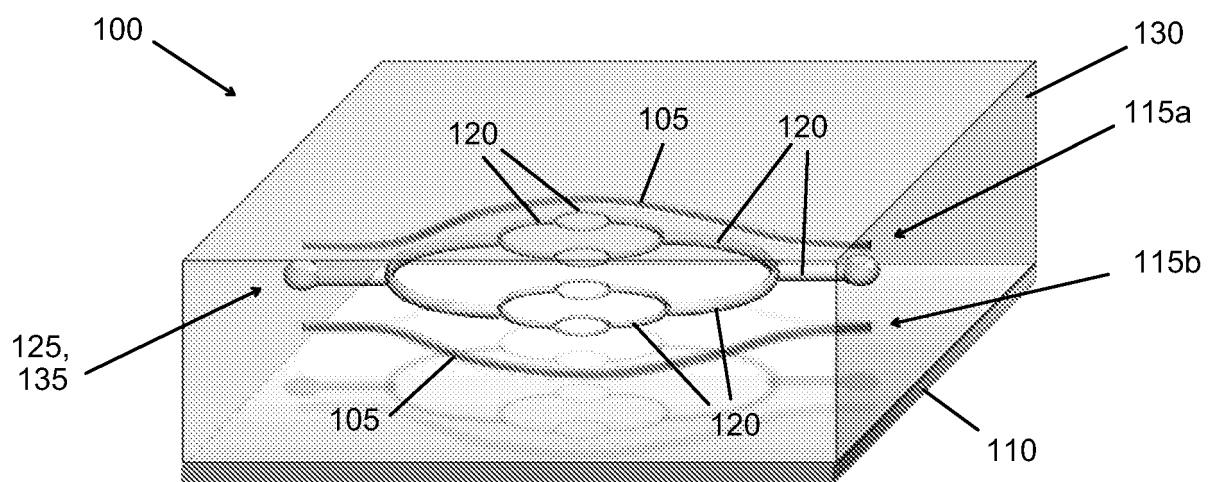


FIG. 2C

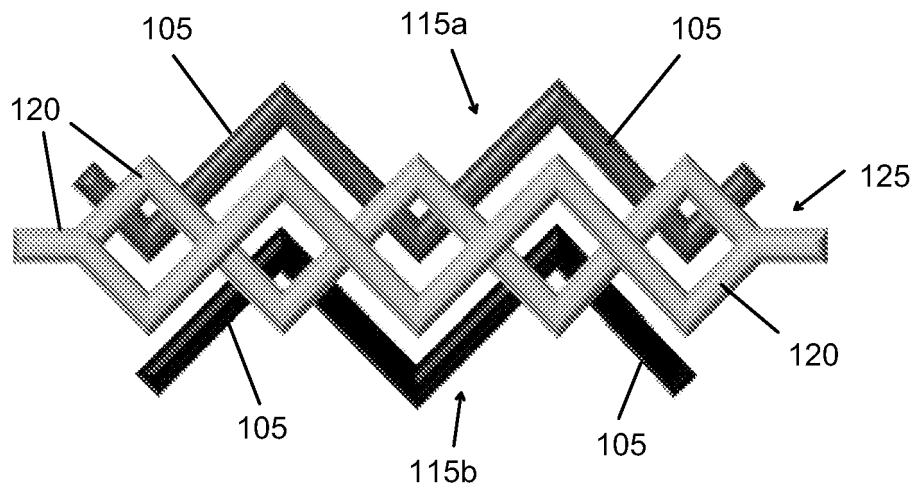


FIG. 3A

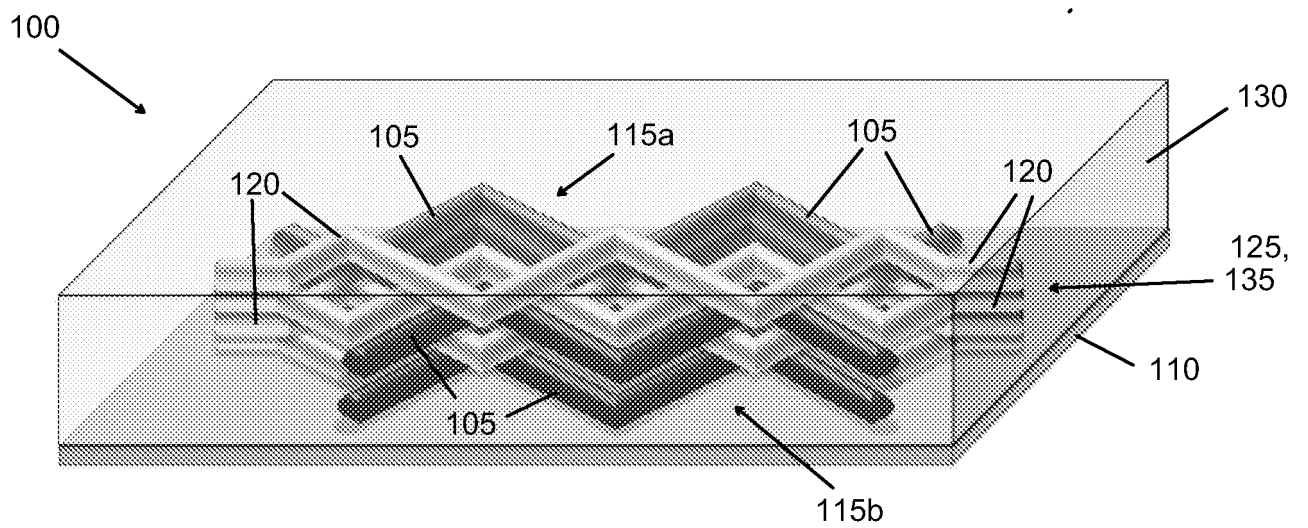


FIG. 3B

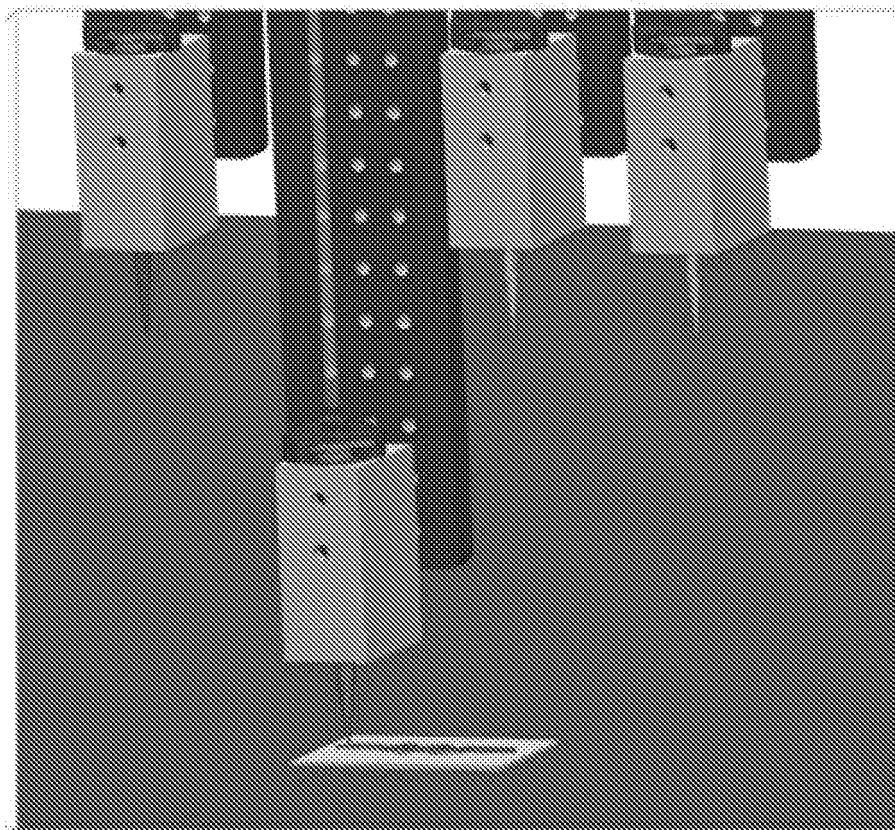


FIG. 4

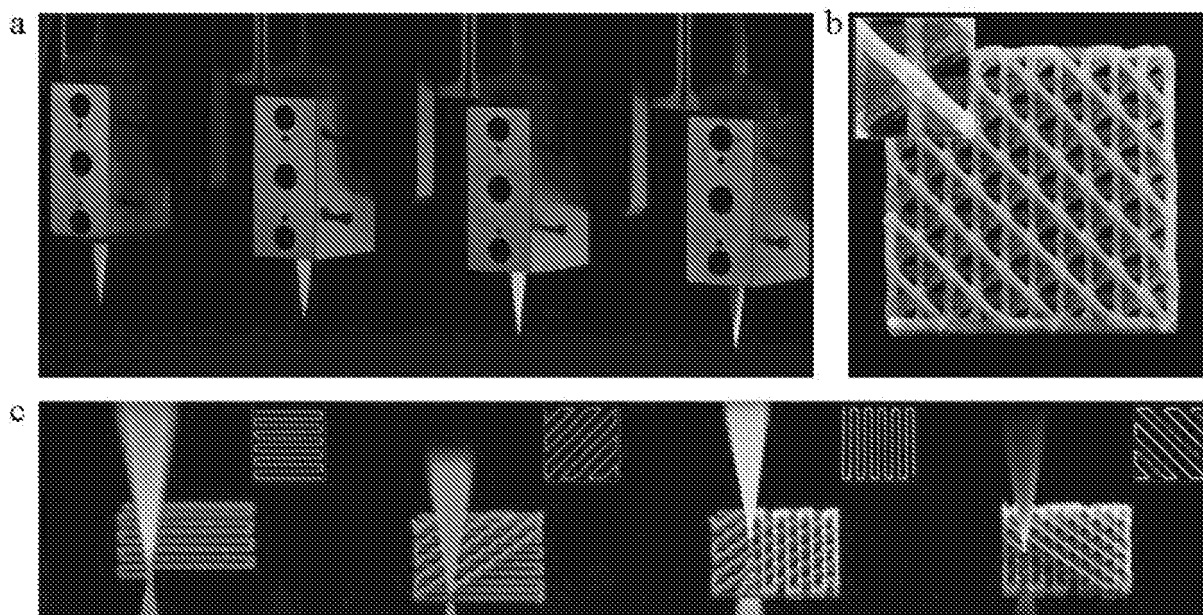


FIG. 5A-5C

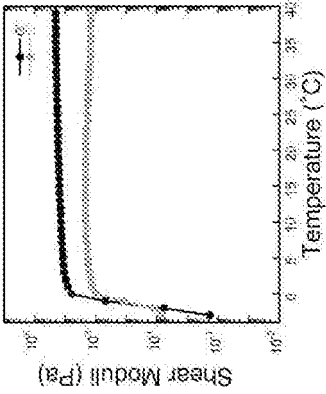
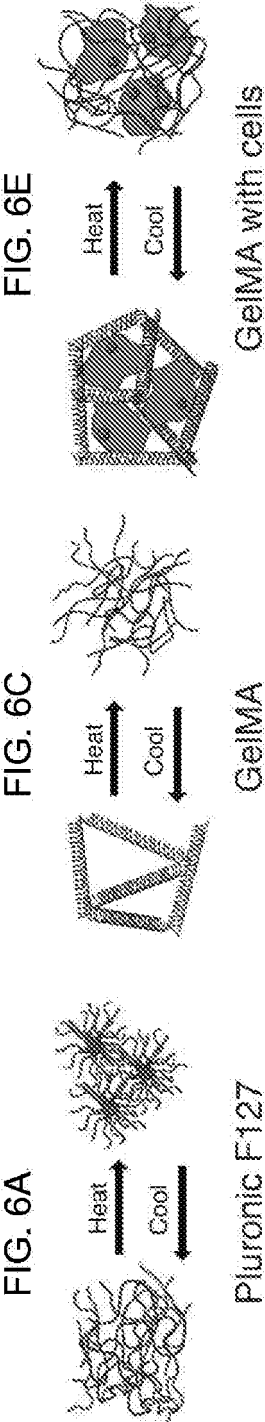


FIG. 6B

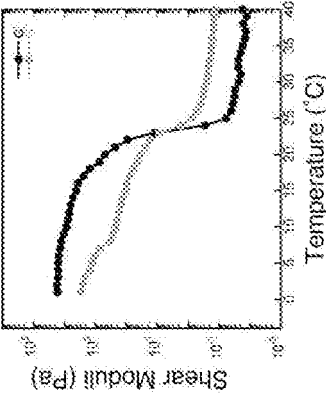


FIG. 6D

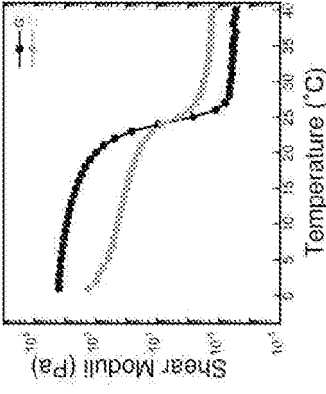
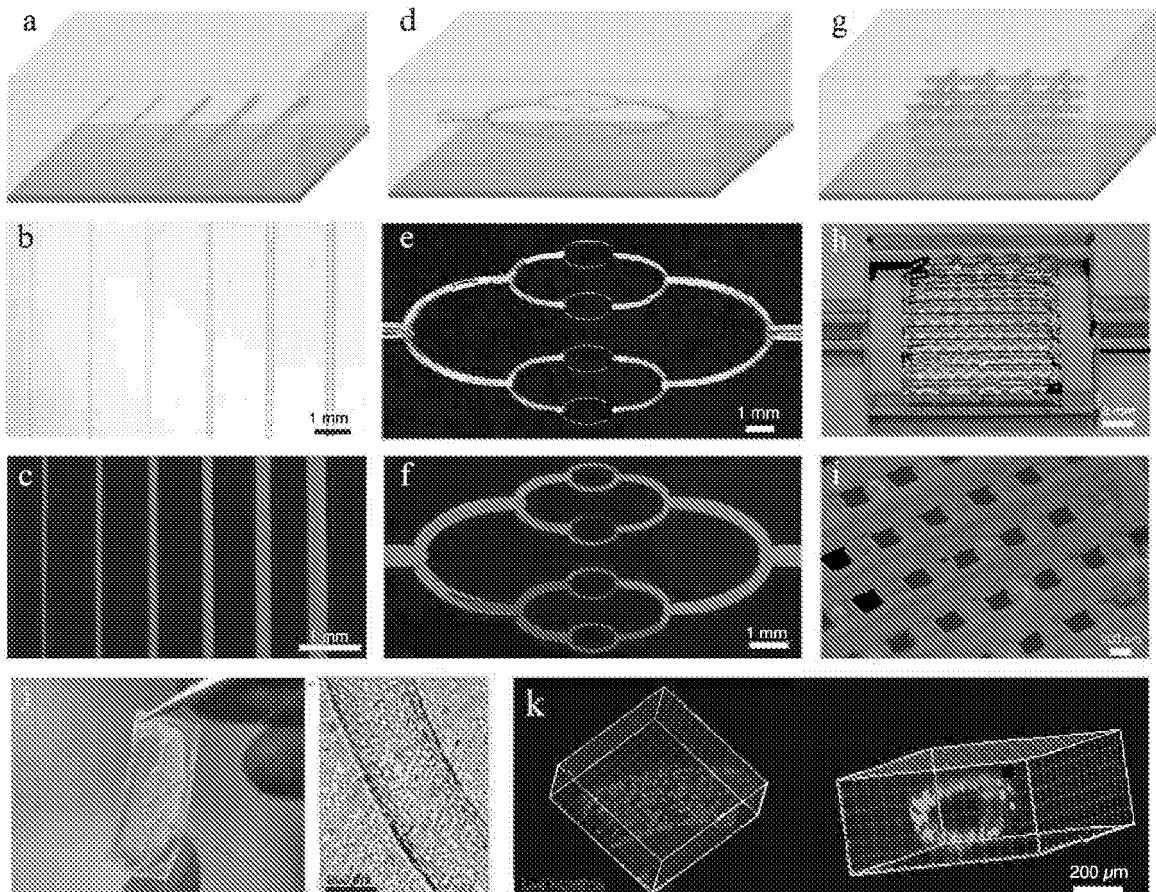


FIG. 6F



FIGs. 7A-7K

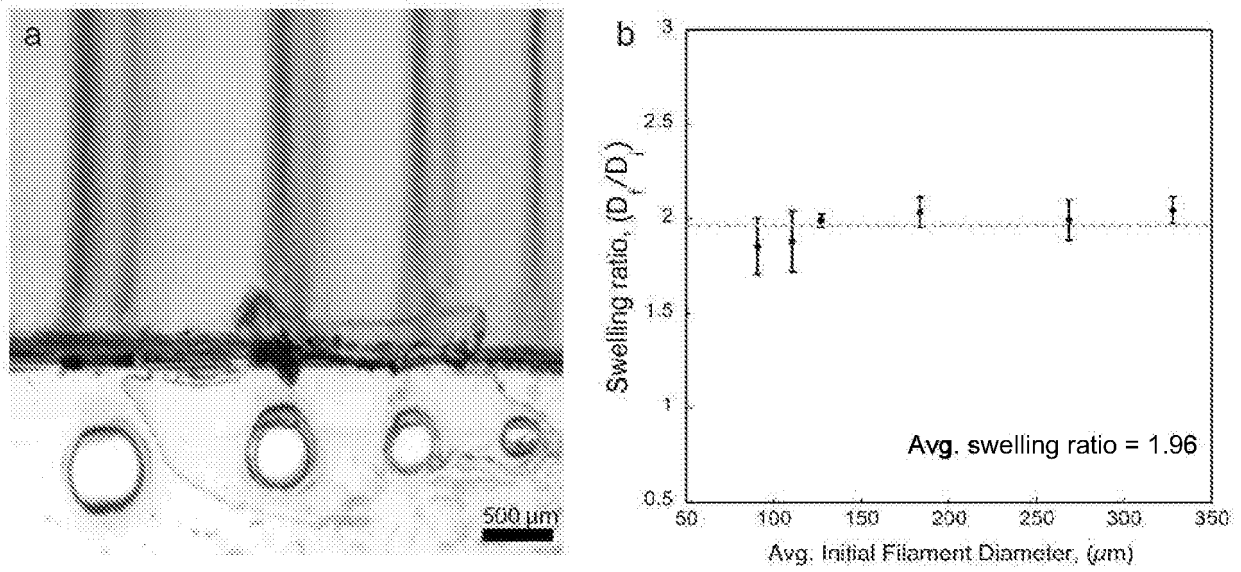
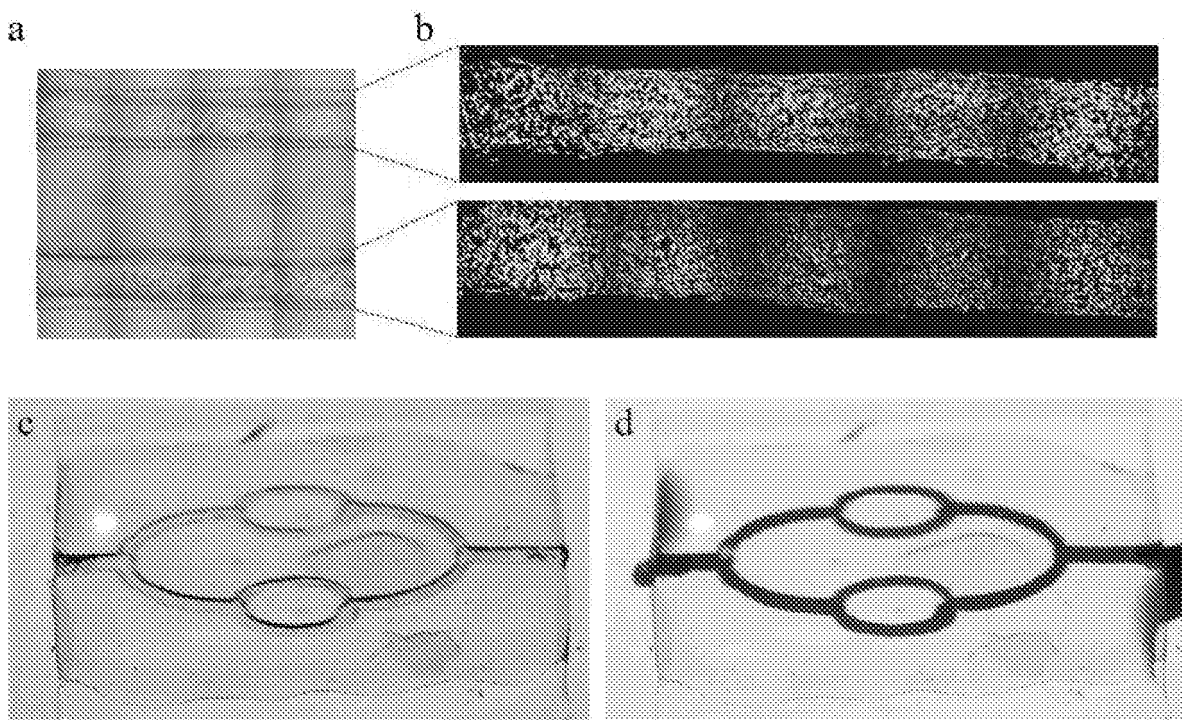
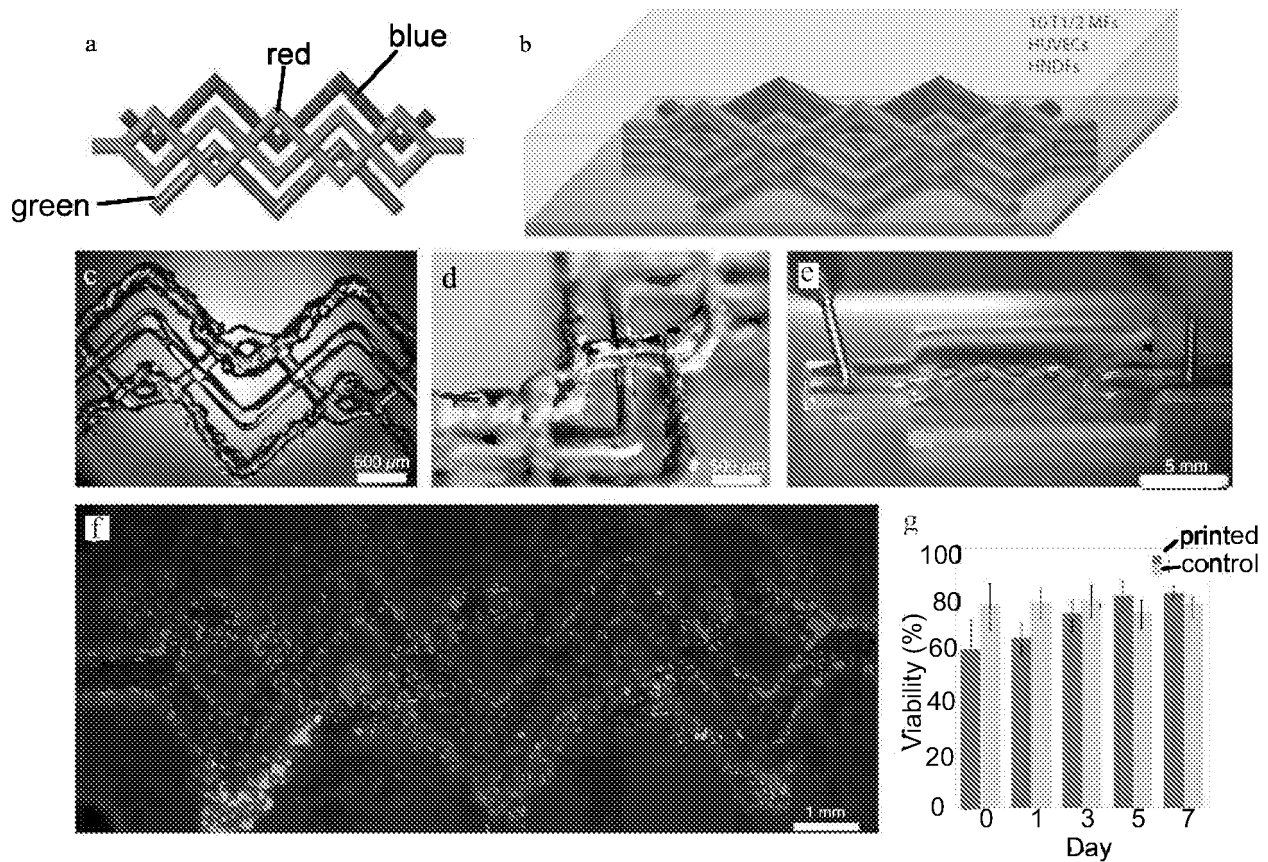


FIG. 8A-8B



FIGs. 9A-9D



FIGs. 10A-10G

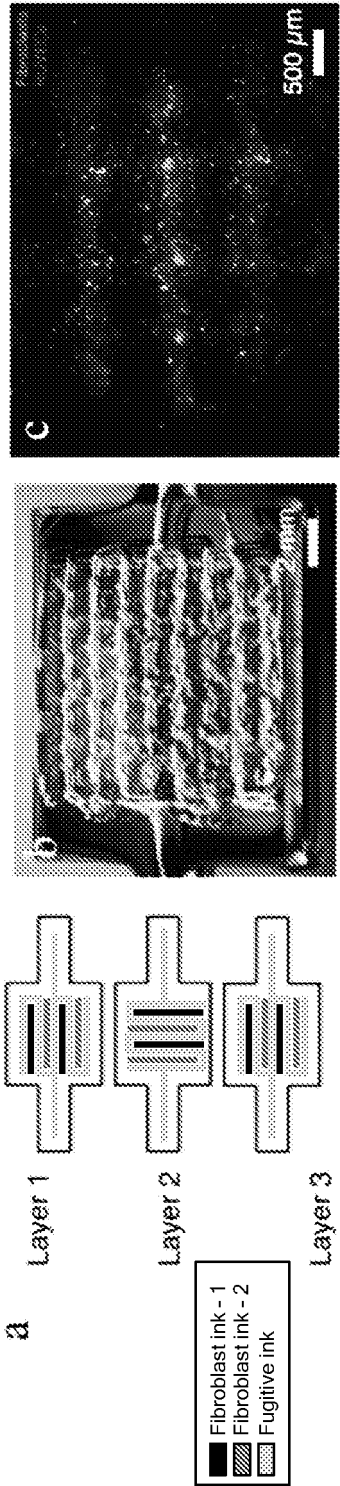


FIG. 11A-11C

FIG. 12A

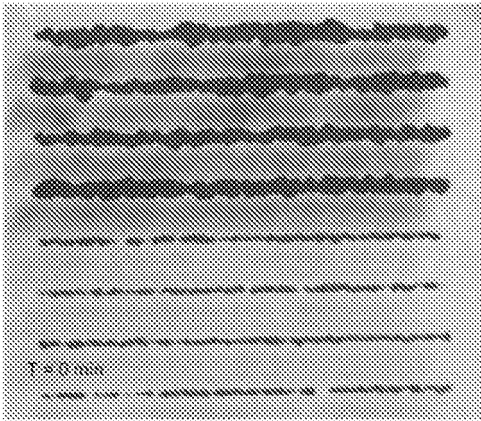
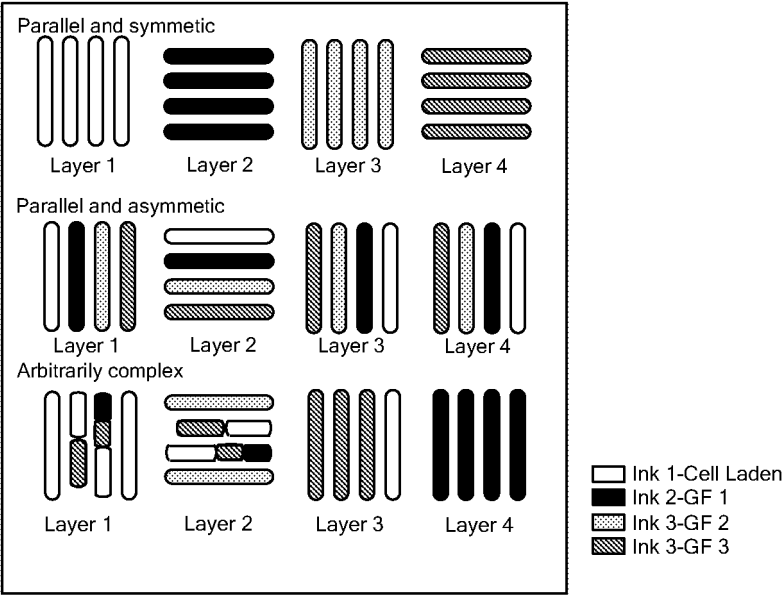


FIG. 12B

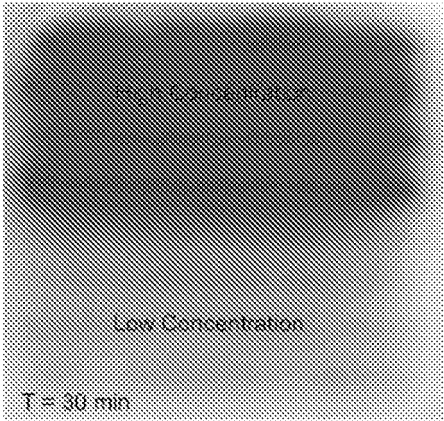


FIG. 12C

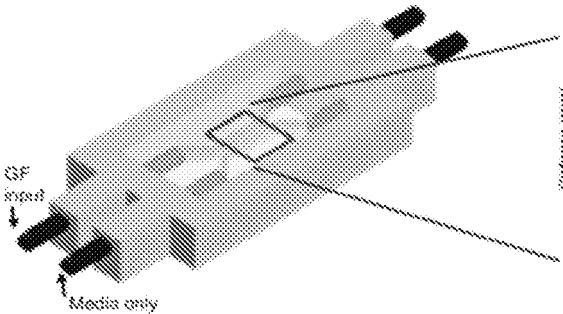


FIG. 12D

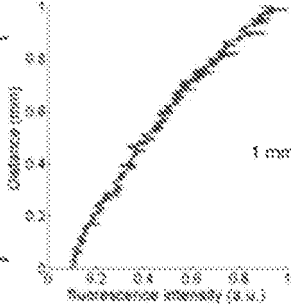


FIG. 12E

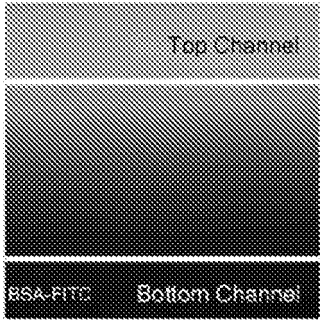
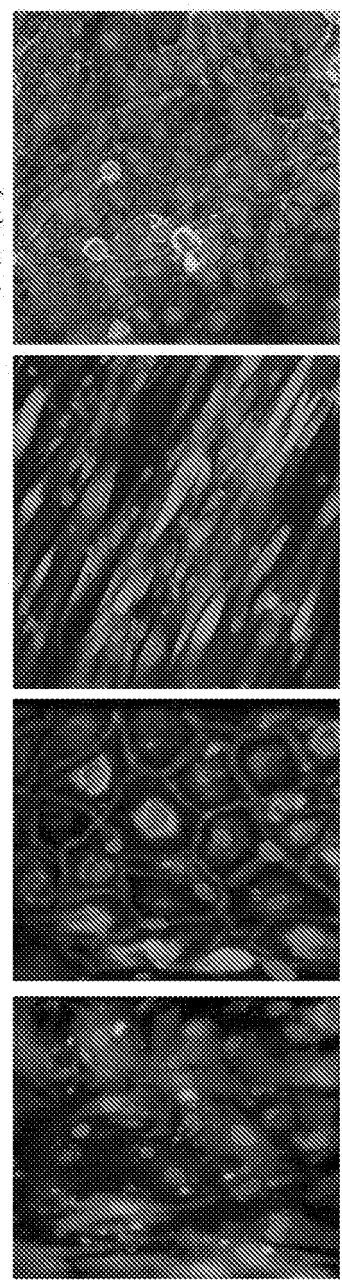
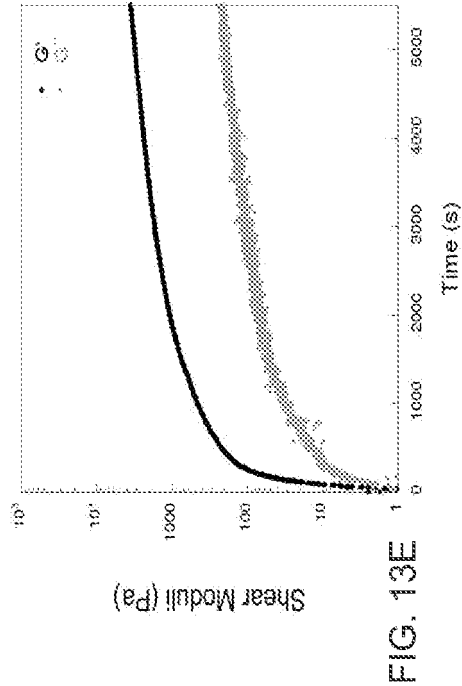
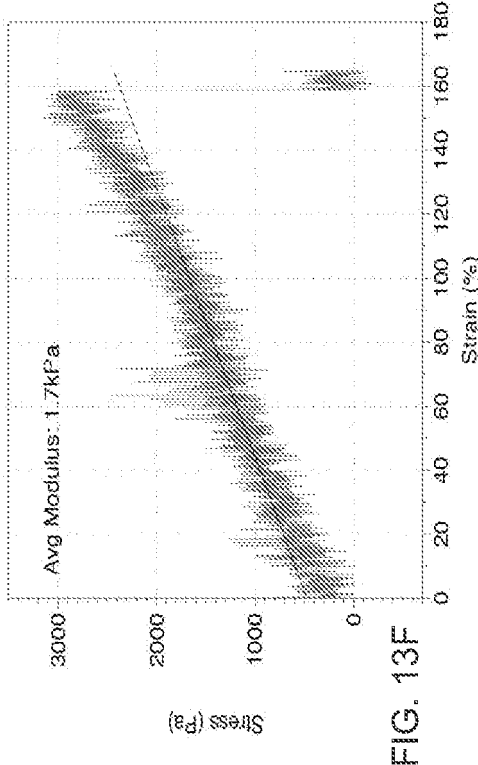
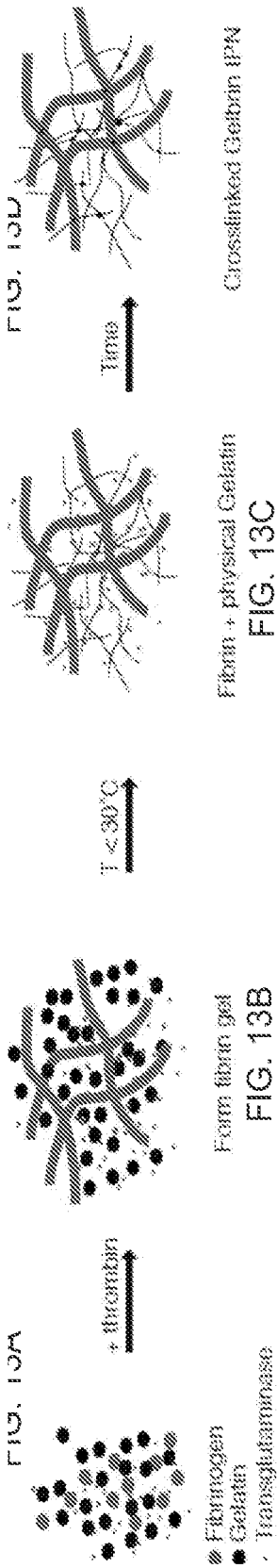


FIG. 12F



Fibroblasts

Endothelial cells

Smooth Muscle cells

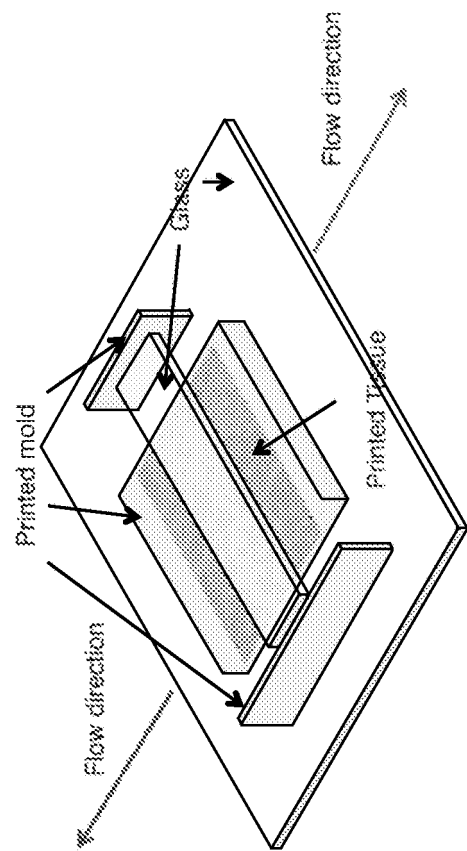
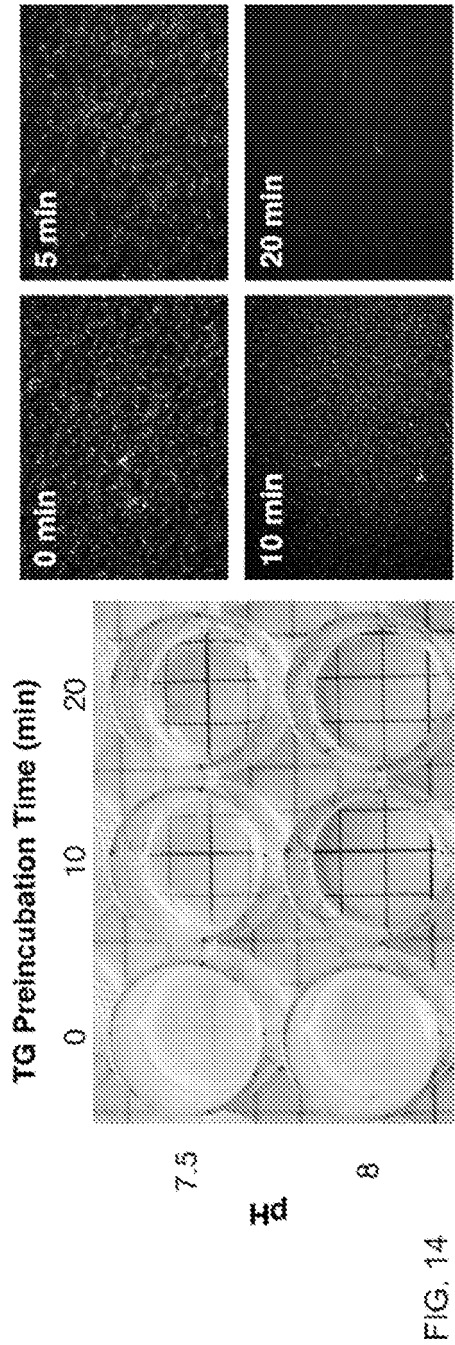
Proximal tubule cells

FIG. 13G

FIG. 13H

FIG. 13I

FIG. 13J



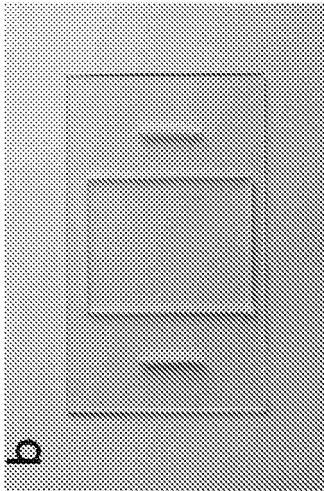


FIG. 15B

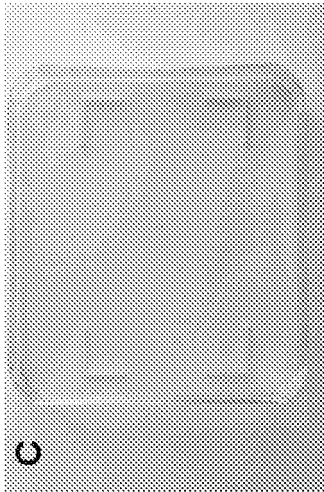


FIG. 15C

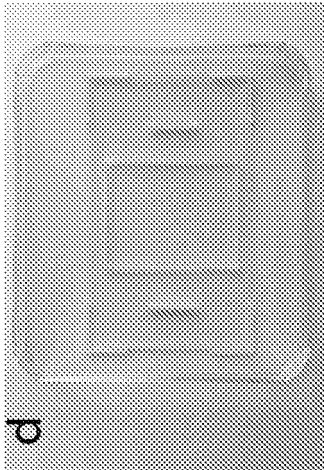


FIG. 15D

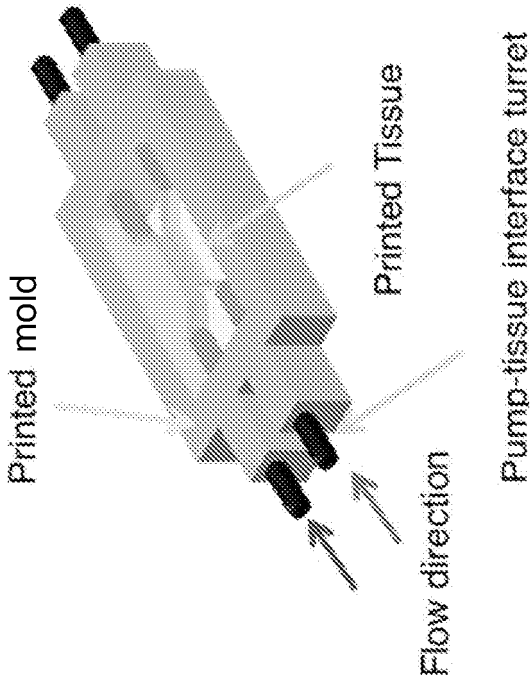


FIG. 15E

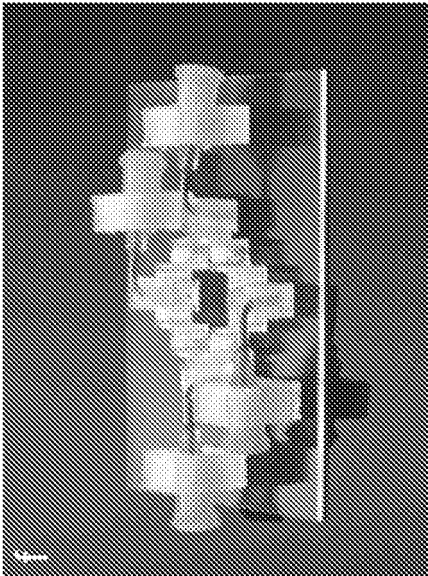


FIG. 15F

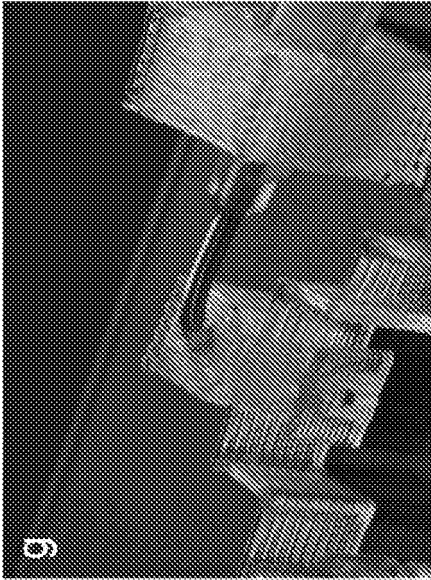
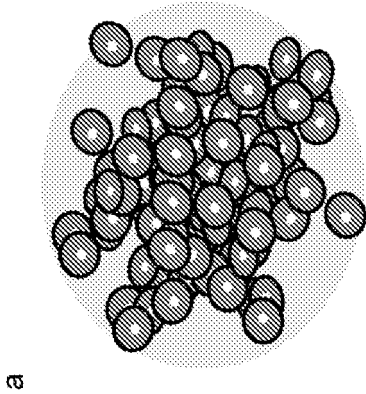


FIG. 15G

FIG. 16A

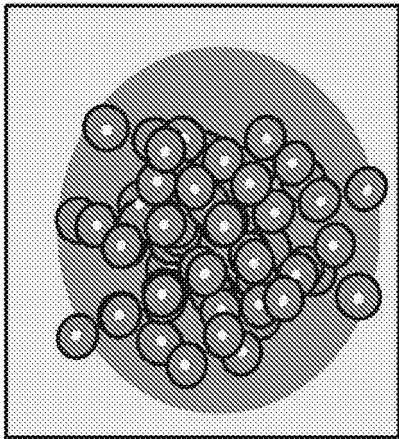
Print Endothelial cells



Endothelial cells dispersed in Pluronic F127 and 3D printed

FIG. 16B

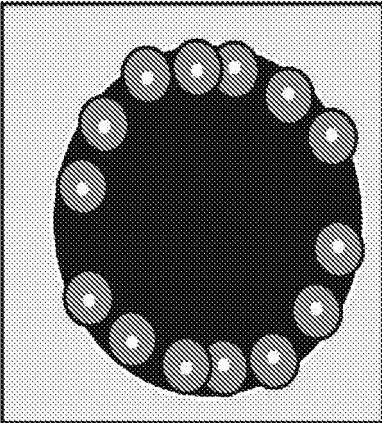
Matrix encapsulation



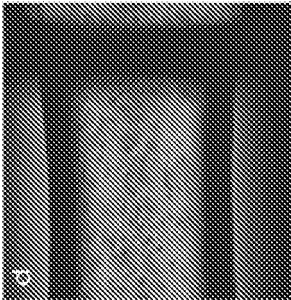
Channels are encapsulated with matrix material.

FIG. 16C

Evacuate

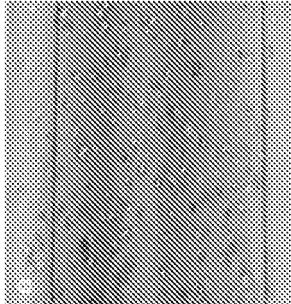


Structure is cooled to liquefy Pluronic F127. Left with a layer of cells on channel walls



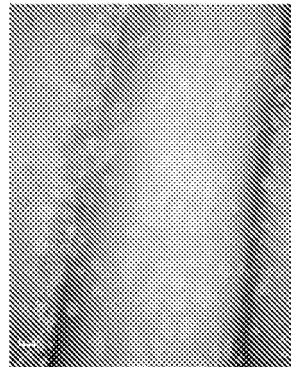
As printed HUVEC-Pluronic

FIG. 16D



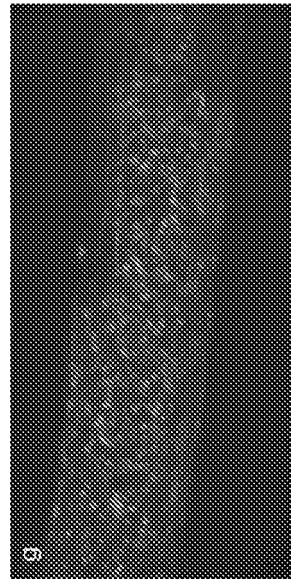
After casting and liquefying

FIG. 16E



After 1 day of incubation

FIG. 16F



After active perfusion for 24hrs

FIG. 16G

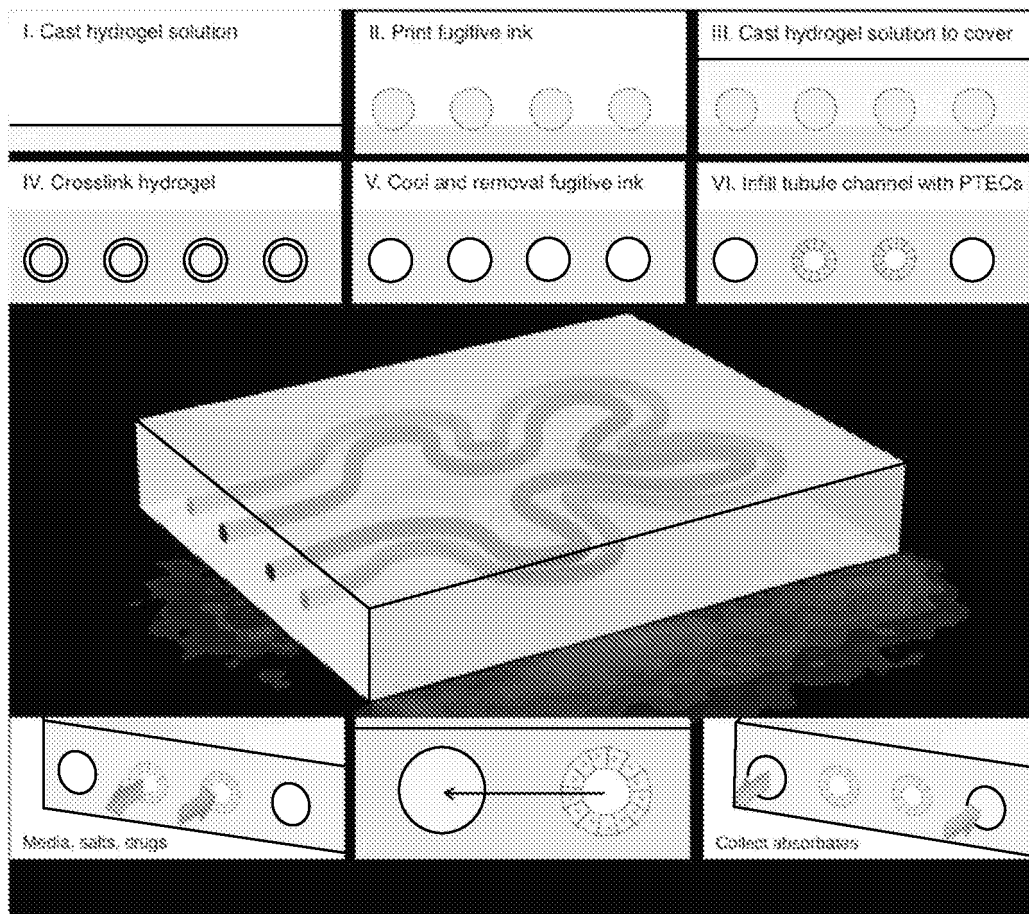


FIG. 17A

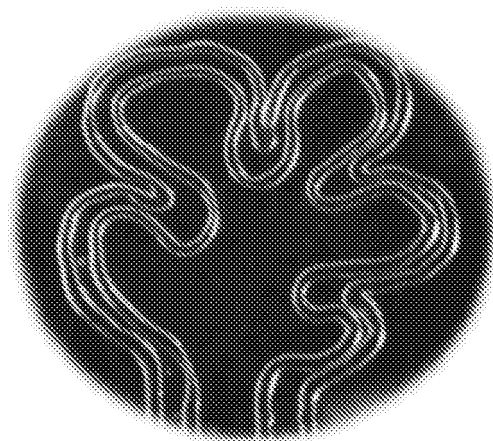


FIG. 17B

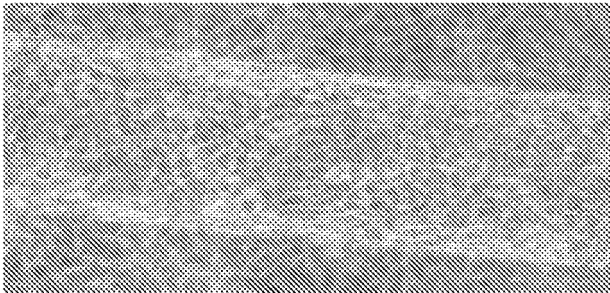


FIG. 17C

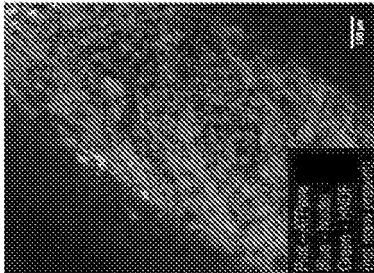


FIG. 17D

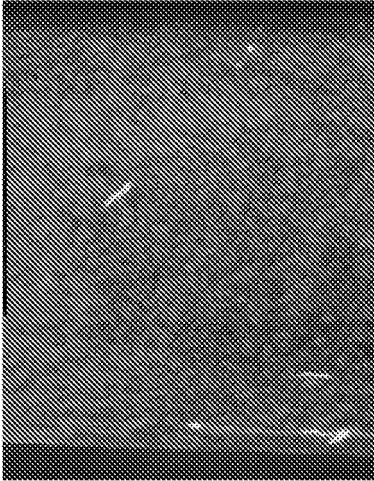


FIG. 17E

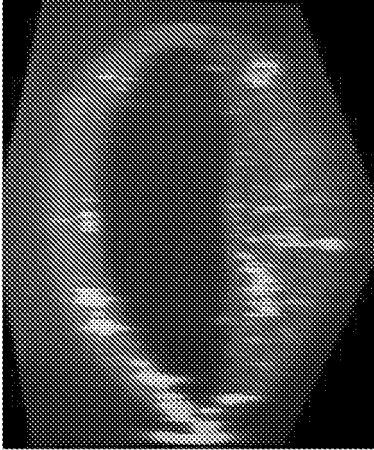


FIG. 17F

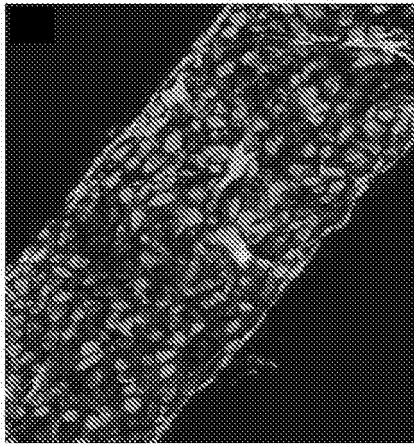


FIG. 18A

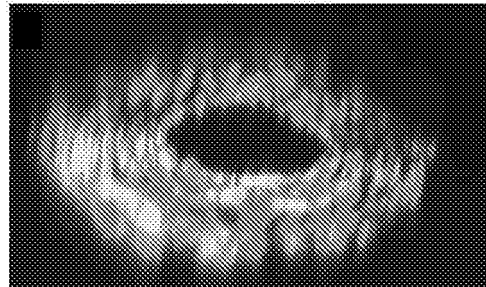


FIG. 18B

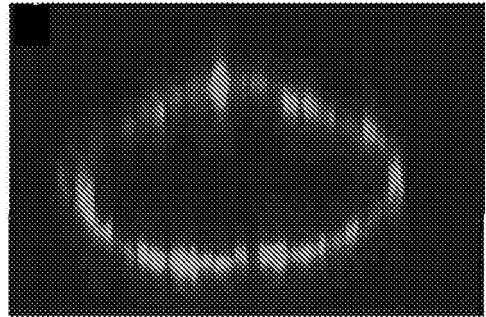


FIG. 18C

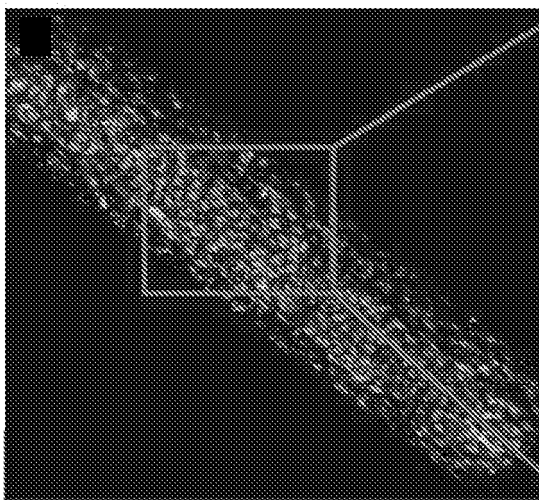


FIG. 18D

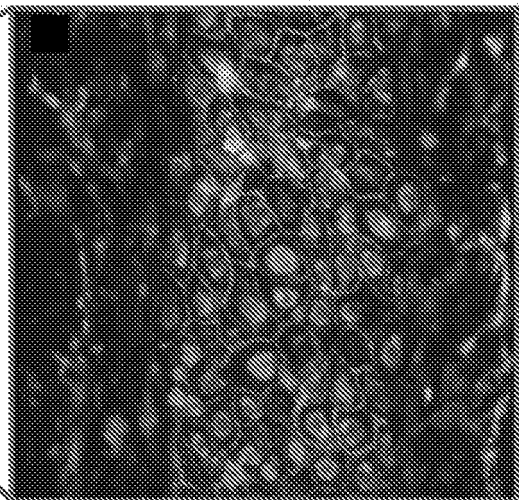


FIG. 18E

FIG. 19A

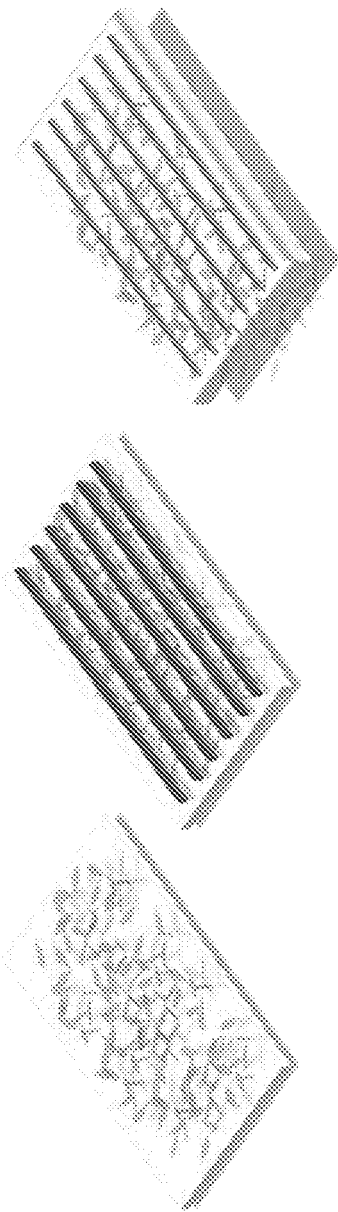


FIG. 19C

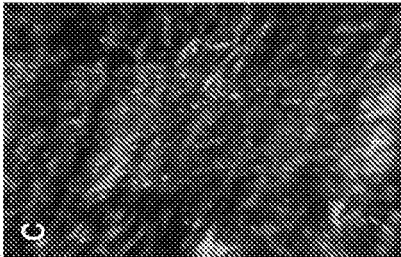


FIG. 19D

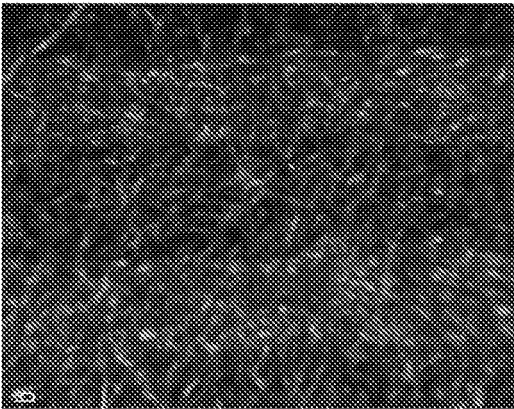
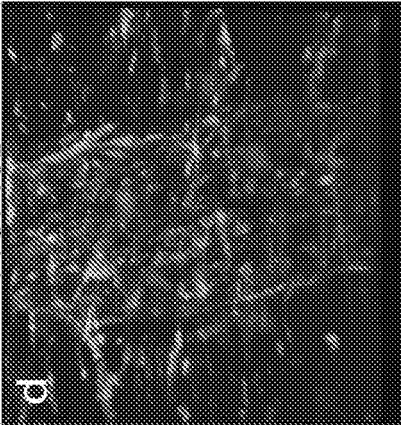


FIG. 19B

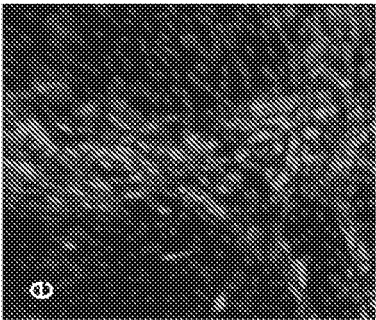


FIG. 19E

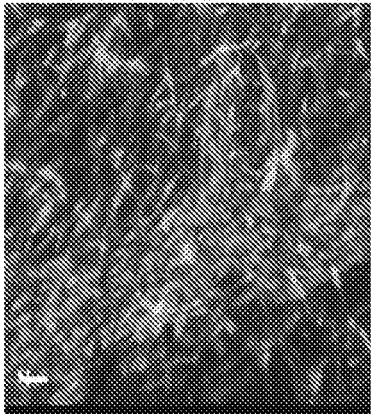


FIG. 19F



FIG. 20A

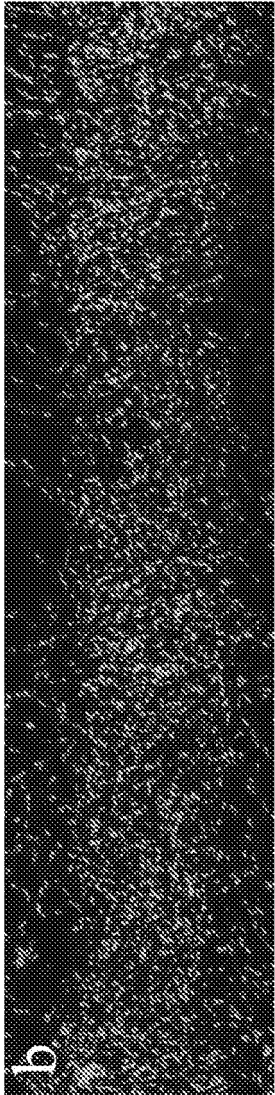


FIG. 20B

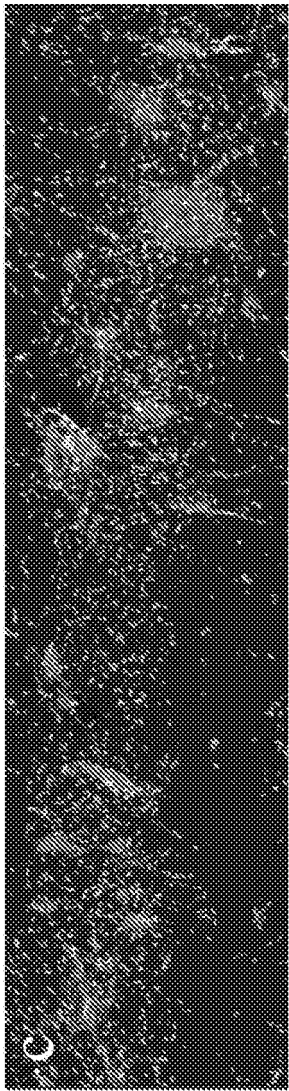
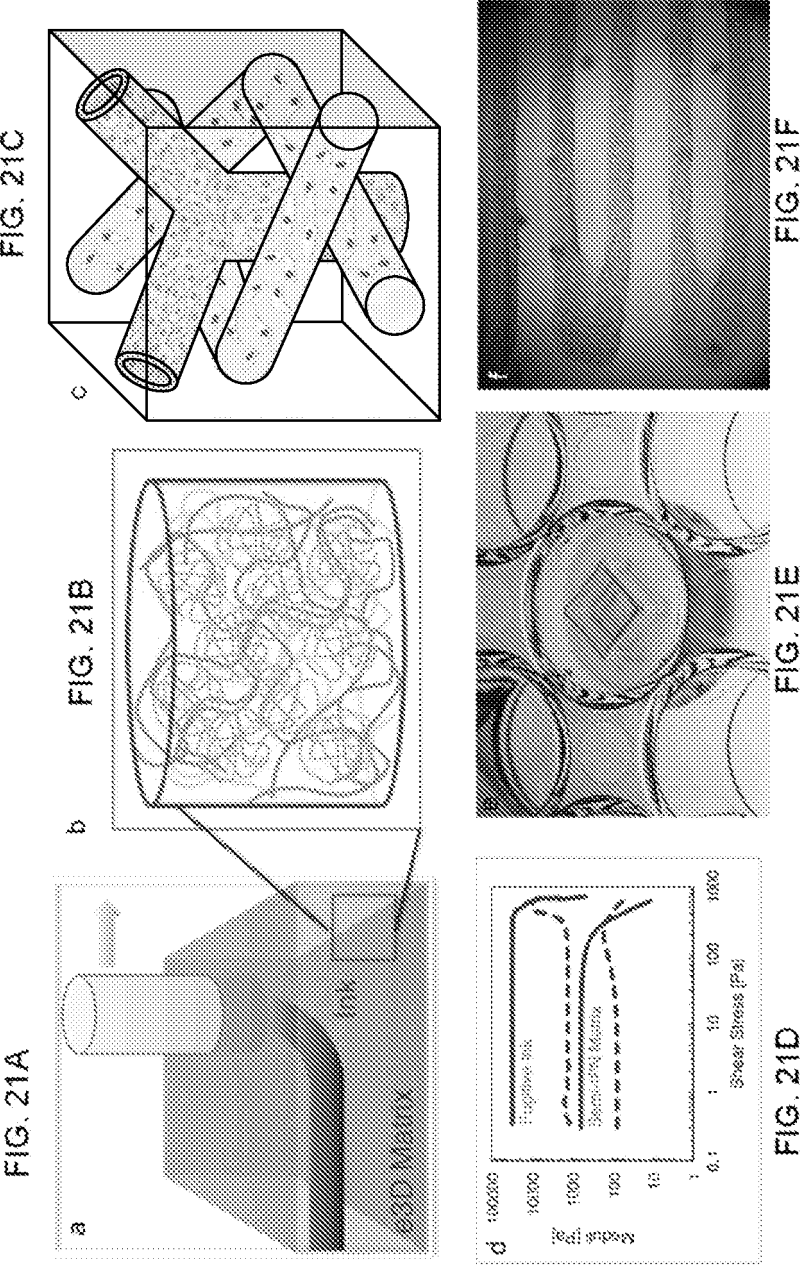


FIG. 20C



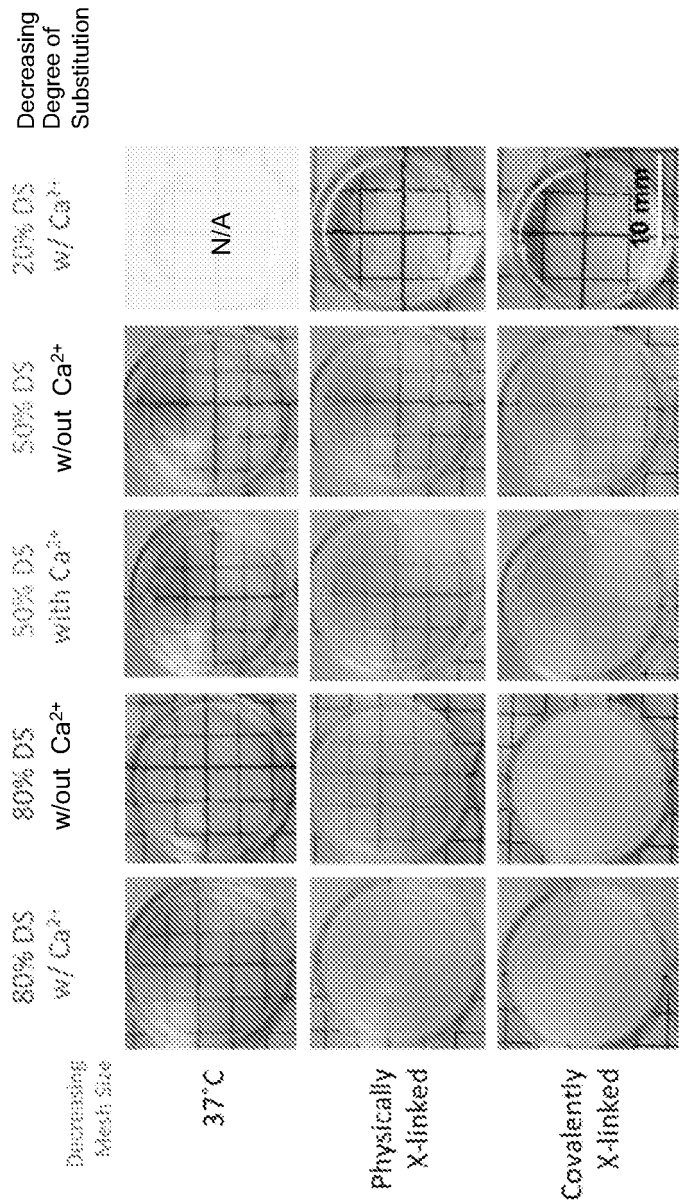


FIG. 22