BIOPRINTING PROTOCOL FOR AORTIC VALVE

Overview: This protocol is a specific way to create an aortic valve from a CT scan using CELLINK Start bioink.

Materials:
Slic3r Software (v1.2.9)
CELLINK Start bioink
INKREDIBLE 3D Bioprinter by CELLINK
Straight tip, 22 GA
Conical tip, 27 GA
Conical tip, 25 GA
Conical tip, 22 GA

Protocol:

1. The first step is to segment and reconstruct a CT image using 3D Slic3r software. Using Slic3r (v1.2.9), convert the 3D model to a bioprinting protocol and toolpath with the following parameters:
   - Layer height = 0.40mm
   - External perimeters extrusion width = 0.40mm
   - Perimeters = 1
   - Infill density = 40%
   - Infill pattern = Rectilinear
   - Printing speed, F = 600mm/min

   Upload the bioprinting protocol with the following name: “Aortic Valve_Scale70_LH04_Infill40_F600.gcode”

2. The following bioprinting parameters can be used with the INKREDIBLE 3D Bioprinter by CELLINK using the pneumatic-driven micro-extrusion technology:

   - Printing pressure for PH1: 100-110 kPa (Nozzle: Straight tip, 22 GA)
   - Printing pressure for PH1: 50-60 kPa (Nozzle: Conical tip, 27 GA)
   - Printing pressure for PH1: 30-35 kPa (Nozzle: Conical tip, 25 GA)
   - Printing pressure for PH1: 25 kPa (Nozzle: Conical tip, 22 GA)
3. Bioprinting metrics
   a. Time for bioprinting: 8 minutes and 18 seconds per construct

**G-codes:**
Aortic Valve_Scale70_LH04_Infill40_F600.gcode

**Further Information:**
human aortic valve.stl

**References:**
N/A