

## BIOPRINTING PROTOCOL FOR AORTIC VALVE

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**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](#))

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- Printing speed: 600 mm/min
- Printhead temperature: Room temperature (22°C)
- Printbed temperature: Room temperature (22°C)

### 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