

## PRINTING PROTOCOL

# CELLINK XPLORE

This is a suggested procedure, please adjust according to your experimental needs.

### Protocol aim

The aim of this protocol is to provide instructions for printing of CELLINK XPLORE using the INKREDIBLE, INKREDIBLE+, BIO X, or BIO X6. Changing the parameters in the protocol might change printing pressure required. CELLINK XPLORE is a non-sterile ink with good printability to be used for training and demonstrations purposes.

### Materials needed

- CELLINK XPLORE\*
- Conical bioprinting nozzles, 22-27G recommended\*
- BIO X\*, BIO X6\* or INKREDIBLE-series\* 3D bioprinter
- Well plate or Petri dish\*
- Crosslinking Agent (included with the ink purchase)

\*The product can be purchased in the CELLINK shop at [www.cellink.com/shop](http://www.cellink.com/shop).

# Protocol

This protocol can be performed with printheads and print bed at room temperature, where room temperature is between 20-25°C.

## 1. Preparing the ink

### MATERIAL

CELLINK XPLORE

### DESCRIPTION

- Use CELLINK XPLORE at room temperature.

Note: It is not recommended to blend cells with CELLINK XPLORE as it is intended for use in demonstration purposes and for visualization of different compartments within a construct

## 2. Printing

### MATERIAL

Conical bioprinting nozzles, 22-27G recommended

BIO X, BIO X6 or INKREDIBLE series bioprinter

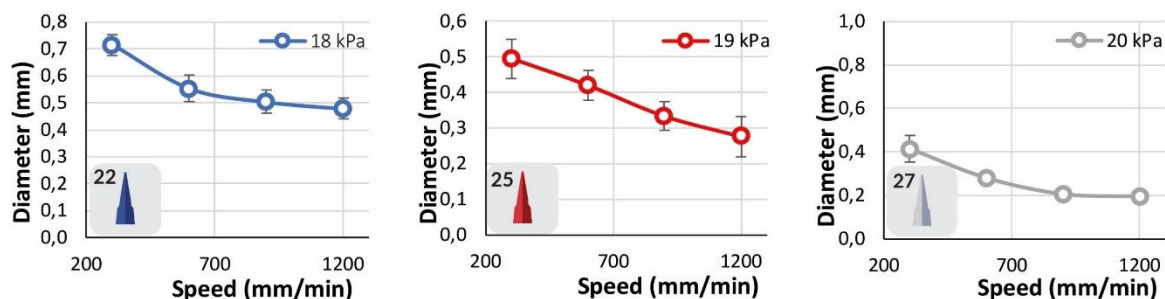
Well plate or Petri dish

### DESCRIPTION

- Cap the cartridge with a printing nozzle of choice and place in the printhead. Connect the cartridge to the air adapter.
- CELLINK XPLORE is not sensitive to the thermal environment during printing and can be printed at room temperature with pressures ranging from 18-20 kPa for nozzle sizes of 20-27G. Figure 1 displays the filament thickness achieved using the minimal pressure needed for extrusion of a continuous filament at different printing speeds.
- Print structures onto a well plate or Petri dish. If printability is not as desired, adjust the pressure up/down by 1 kPa to extrude more/less material.

Note: If waiting more than 5 minutes between extrusions the ink can dry in the nozzle causing it to clog. If this occurs, replace with new nozzle.

Note: Test the flow of the ink after the calibration is performed and start with a low pressure and increase stepwise.



**Figure 1.** Resulting filament diameter when printing at different nozzle sizes, printing pressures and printing speeds.

# 3. Crosslinking

## MATERIAL

Crosslinking Agent

## DESCRIPTION

CELLINK XPLORE is crosslinked using the CaCl<sub>2</sub>-containing Crosslinking Agent.

- Submerge the constructs in the Crosslinking Agent for 30 seconds to 5 minutes depending on construct size, infill density and desired construct stiffness. Remove Crosslinking Agent and rinse constructs with water or PBS.

Note: 30 seconds is recommended for 10 µL droplets while 10 minutes might be required for dense 1 cm<sup>3</sup> blocks.