

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.

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±4 kPa for nozzle sizes of 20-27G. Figure 1 display 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.

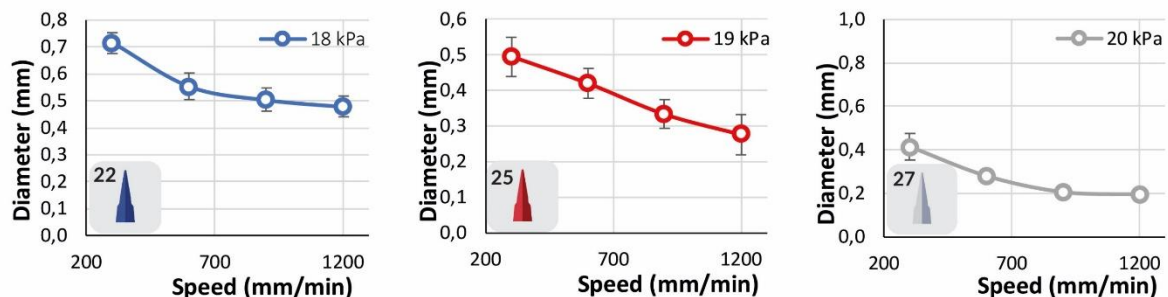


Figure 1. Resulting filament diameter when printing at different nozzle sizes, printing pressures and printing speeds.

3. Crosslinking

MATERIAL

Crosslinking Agent

DESCRIPTION

CELLINK XPLORE is crosslinked using the CaCl₂-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 cm³ blocks.