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Application Note

CELLINK BONE

Description

CELLINK® BONE is a modified version of our universal CELLINK® bioink designed for targeted-cell differentiation. This modification imparts an osteogenic capacity to guide cell differentiation. This is enabled by tricalcium phosphate (TCP) particles evenly dispersed throughout the ink.

Application

CELLINK® BONE is intended for use with cell types and tissue applications related to bones, joints and their interfaces, such as the bone-to-ligament or bone-to-cartilage transition region. As a universal bioink, it can be supplemented with other osteogenic factors, like BMP-2, to further enhance its osteogenic properties. CELLINK® BONE can be used as a base material for fabricating bone constructs. It can also be used to supplement constructs made with thermopolymers, such as PCL or PLGA.

Storage

Store CELLINK® BONE between four and eight degrees Celsius. CELLINK® BONE has a shelf life of six months. The expiration date is stated on the package. Ensure the cartridges are capped prior to storage to prevent drying. Keep CELLINK® BONE unfrozen – placing CELLINK® BONE in the freezer risks impairing its printability.

Mixing with Cells

We recommend mixing CELLINK® BONE with a high concentration of cells. You can mix the cells manually or, for larger quantities, use our revolutionary CELLMIXER. The CELLMIXER is designed to simplify the mixing process and offer a homogeneous suspension with increased cell viability. Please see the *Mixing with Cells Protocol* for more details.

Crosslinking

CELLINK® BONE crosslinks simply with our $CaCl_2$-containing crosslinking solution. After bioprinting, apply enough droplets to cover the construct. A 30-second to 5-minute incubation is sufficient for most bioprinted structures. After incubation, remove the crosslinking solution, wash with PBS or basal cell-culture medium and replace with the desired cell culture media.

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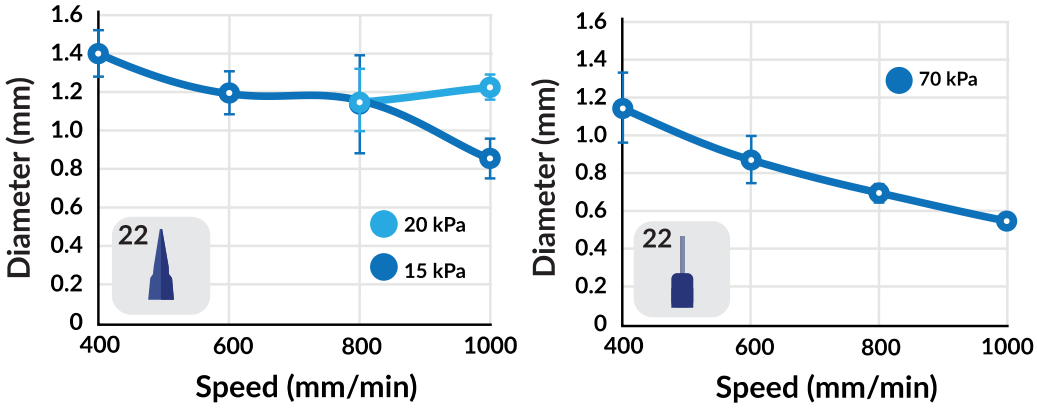
Printing Parameters

To optimize printability, we recommend the following parameters. Mix the bioink before printing to ensure uniform mineral distribution and prevent nozzle clogging. The TCP particles in CELLINK® BONE increase the risk of clogging. To reduce the risk of clogging, use nozzles with a 22-gauge diameter or smaller. Replace clogged nozzles. Avoid increasing pressure on a clogged nozzle.



Printability Observations

CELLINK® BONE may produce a filament diameter larger than that of the extrusion nozzle. To account for this, we recommend printing CELLINK® BONE at a faster translation rate and lower pressure.

CELLINK® BONE is not sensitive to the thermal environment during printing. We recommend printing CELLINK® bioink at room temperature. If cells are blended in, CELLINK® bioink can be printed at a maximum of 37 degrees Celsius

Replace the nozzle after pausing printing for more than ten minutes, as inactivity can cause CELLINK® bioink to dry at the tip and clog the nozzle.

For easier and more precise dispensing of crosslinking solution, use the Syringe Printhead as a second printhead to dispense crosslinking solution onto the newly printed construct.

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