

Application Note

CELLINK Bioink

Description

CELLINK® bioink is the first universal bioink designed to optimize 3D bioprinting of human tissues. CELLINK® bioink is a non-animal derived polysaccharide hydrogel, and its biocompatibility and ease of bioprinting make it the best bioink for 3D cell culturing. Simply stabilize the bioprinted construct with our crosslinking solution. CELLINK® bioink can be utilized as a base bioink with our **VASKIT** to develop vascularized tissues.

Application

CELLINK® bioink is intended for and has been used with a wide range of cell types. It supplements easily with a range of tissue-specific constituents and biomolecules to tailor its differentiation capacity toward nearly every target tissue or cell type. CELLINK® bioink's biological functionality has been evaluated extensively for tissue engineering applications. In these cases, the maturation of human chondrocytes bioprinted with CELLINK® bioink into neo-tissues was evaluated with gene expression and protein levels. Studies validate CELLINK® bioink's capacity to support the synthesis of cartilage-specific extracellular matrix components by human chondrocytes. Additionally, the material demonstrated compatibility with skin and tumor applications.

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Storage

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

Mixing with Cells

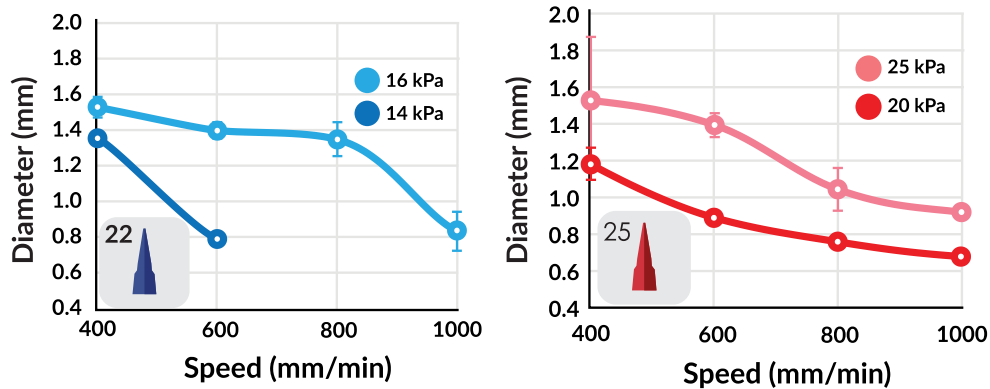
We recommend mixing CELLINK® bioink with a high concentration of cells. You can either mix the cells manually or, for larger quantities, use our revolutionary **STARTINK-Kit** with our **CELLMIXER**. The **CELLMIXER** is designed to simplify the mixing process and enable a homogeneous suspension with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

Crosslinking

CELLINK® bioink easily crosslinks with our CaCl₂-containing crosslinking solution. After bioprinting, apply enough droplets to cover the construct. A 30-second to 5-minute incubation time is sufficient for most structures. After incubation, remove the crosslinking solution, wash with PBS or basal cell-culture medium and add the desired cell culture media.

Printing Parameters

We recommend using the following parameters to optimize printability. Set the layer height to equal to the inner nozzle diameter. Optimal printing temperature is between 20 and 37 degrees Celsius.



Printability Observations

CELLINK® bioink may produce a filament larger than the extrusion nozzle's diameter. To account for this, we recommended printing CELLINK® bioink at a faster translation rate and lower pressure. CELLINK® bioink contains nanocellulose, elevating the chance of clogging. To minimize clogging risk, use nozzles with a 25-gauge diameter or larger. CELLINK® bioink 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.