Celluid AM kit

Catalog Number: CBA-102

Overview

Celluid AM offers a alginate methacrylate (AIMA) for photocrosslinkable hydrogels or for mixing with other photocrosslinkable hydrogels (such as collagen, gelatin, or hyaluronic acid). Celluid AM can form 3d printed hydrogels and can be modulated at various concentrations and gel stiffness. This product can be ordered by itself (500 mg of lyophilized sponge), or as a kit that comes with a photoinitiator (ilgacure 2959) for photocrosslinking.

Items	Form	Quantity
Celluid® AM	Solid sponge	200 mg
Photoinitiator (Irgacure 2959 or LAP)	Liquid	10 ml

Storage & Handling

Celluid AM must be stored under -20℃, before use. And Irgacure 2959 can be stored at RT. However, 4 ℃ is recommended for a long term storage. Celluid AM and irgacure 2959 are light and moisture sensitive materials.

Caution

This product is for research use only. Not approved for use in diagnostic or therapeutic procedures.

Instructions for Use

A. To print with cells

1. Prepare bioink-cell solution

1) Dissolve 0.1~0.5 wt% irgacure 2959 in buffered saline (without divalent cations) and incubate 37℃ until clear solution. If crystal is present in the solution, sonicate and vortex the vial until fully dissolved.

2) Dissolve 1.0~2.0 wt% Celluid AM (AIMA) or mixing with other photocrosslinkable bioinks in sterile container with irgacure 2959 solution and warm at 37 °C to make a homogeneous bioink solution. Do not vortex or shake vigorously.

3) Next, filter the bioink solution into a sterile conical tube using a syringe and 0.22 μm sterile syringe filter. The filtered bioink solution is photosensitive, and light exposure must be avoided.

4) Resuspend the cell pellet at the desired cell density with the bioink solution by gently and slowly pipetting up and down several times. Ensure the cells are evenly distributed in the bioink solution by gently and slowly pipetting up and down several more times. Do not vortex or shake vigorously.

5) Be careful not to dilute the bioink solution with cell culture medium because the medium might interfere with the printability of the bioink. (Use of culture medium without divalent cations is strongly recommended)

6) Pipette the bioink-cell solution into the desired printing dispenser.

2. Bioprinting

1) Cool the filled printing cartridge to below 15 °C using a “temperature-controlled printing dispenser”, if available, or place the cartridge in 4 °C refrigerator for 15 minutes to induce gelation. If your print bed has a temperature control, set temperature to 15 °C (Do not keep cell laden bioink at low temperature for more than 20-30 minutes as that can be harmful for cell viability)

2) Follow the manufacturer's 3D printer instructions. Load the print cartridge onto the 3D printer and print directly onto a Petri dish or into multi-well plates. Adjust the flow rate according the nozzle diameter, printing speed, printing pressure, and temperature.

<Example>

3D bioprinter: U-FAB™ ACTIVO
Dispenser Temperature: 15 °C
Bed Temperature: 10~15 °C
Printing Speed: 200 mm/min
Nozzle: 18~20 G
Pressure: 1~10 Psi

3. Crosslinking
Place the UV light source directly above the 3D-bioprinted structure and expose the structure to UV light (wavelength 365 nm). Use the appropriate distance and exposure time based on your light source.

4. Cell cultivation
Culture the printed tissue with the appropriate cell culture medium following standard tissue culture procedures.

B. To print without cells

1. Prepare bioink solution

1) Dissolve 0.1~0.5 wt% irgacure 2959 in buffered saline (without divalent cations) and incubate 37℃ until clear solution. If crystal is present in the solution, sonicate and vortex the vial until fully dissolved.

2) Dissolve 1.0~2.0 wt% Celluid AM (AIMA) in sterile container with irgacure 2959 solution and warm at 37 °C to make a homogeneous bioink solution. Do not vortex or shake vigorously.

3) Next, filter the bioink solution into a sterile conical tube using a syringe and 0.22 μm sterile syringe filter. The filtered bioink solution is photosensitive, and light exposure must be avoided.

2. Bioprinting

1) Cool the filled printing cartridge to below 15 °C using a "temperature-controlled printing dispenser", if available, or place the cartridge in 4 °C refrigerator for 15 minutes to induce gelation. If your print bed has a temperature control, set temperature to 15 °C.

2) Follow the manufacturer's 3D printer instructions. Load the print cartridge onto the 3D printer and print directly onto a Petri dish or into multi-well plates. Adjust the flow rate according the nozzle diameter, printing speed, printing pressure, and temperature.

<Example>

3D bioprinter: U-FAB™ ACTIVO
Dispenser Temperature: 15 °C
Bed Temperature: 10~15 °C
Printing Speed: 200 mm/min
Nozzle: 20~22 G
Pressure: 1~10 Psi

3. Crosslinking

Place the UV light source directly above the 3D-bioprinted structure and expose the structure to UV light (wavelength 365 nm). Use the appropriate distance and exposure time based on your light source. (If not used immediately, the crosslinked structure should be stored at 2–8 °C. If stored under aqueous conditions, some hydrolytic degradation will occur; shelf life will be a few weeks)