Universal Bioink™ Kit - Mixing Protocol (Without Cells)

General Information

Storage

Universal Bioink™ in solid form should be stored at -20˚C, in the absence of light, for a maximum of 6 months.

The **completely reconstituted Universal Bioink™** should be stored at 2 to 8 °C, in the absence of light, for a maximum of 10 days.

Always reseal all **Universal Bioink™** kit jars and vials after use.

Intended Use

For research purposes only.

Safety Information

Work in a ventilated area and use suitable personal protective equipment. For more information, please refer to the Safety Data Sheets.

Protocol

This protocol outlines the mixing and preparation of the **Universal Bioink™** without the use of cells.

Guidelines for Handling

The **Universal Bioink™** was produced under sterile conditions. To maintain the sterility of the product, the components should be handled in a **sterile environment.**

For best results, components should be protected from light while mixing, preparing, and storing the **Universal Bioink™.**

Materials

Materials included in the Universal Bioink™ Kit:

- Bioink Photoinitiator: LAP (28 mg, non-sterile)
- Universal Bioink™ (830 mg, sterile)
- 0.22 µm syringe filter (sterile)
- Magnetic stir bar (12.7 mm × 8 mm, sterile)
- Magnetic stir bar (12.7 mm × 3.2 mm, sterile)

Other materials required:

- 10.3 mL of buffer or media of choice (PBS, cell culture medium, etc.)
- Magnetic stirring hotplate
- Pipette(s)
- Pipette tips
- Syringe
- Needle

Preparation

1. Remove the **Bioink Photoinitiator: LAP** and **Universal Bioink™** from cold storage and allow the materials to reach room temperature.
2. Using a pipette, add **7.5 mL** of **buffer or media** and add the **12.7 mm × 8 mm magnetic stir bar** to the amber jar containing the **Universal Bioink™**.
3. Using a **stirring hotplate**, heat the **Universal Bioink™** to 38 ± 2 °C while gently stirring (300-500 rpm). Once the **Universal Bioink™** components begin to dissolve and the polymers become fully submerged in the solution, the stir rate may be increased to 700-1000 rpm to aid dissolution. Complete dissolution will typically take 3-4 hours.
4. Using a pipette, add **2.8 mL** of **buffer or media** and add the **12.7 mm × 3.2 mm magnetic stir bar** to the amber vial containing the **Bioink Photoinitiator: LAP**.
5. Using a stirring hotplate, heat the **Bioink Photoinitiator: LAP** at 38 ± 2 °C while gently stirring (300-500 rpm) until the **Bioink Photoinitiator: LAP** is fully dissolved. This will typically take 10-20 minutes.
6. To maintain sterility of the **Universal Bioink™**, the **Bioink Photoinitiator: LAP** must be sterile filtered prior to addition. Take up the entire, warm, **Bioink Photoinitiator: LAP** solution using a syringe and needle. Replace the needle with the **0.22 µm syringe filter**, and filter the entire solution into the completely dissolved **Universal Bioink™**.

Note: the typical volume of the **Bioink Photoinitiator: LAP** solution lost to the syringe filter during filtering has been accounted for in this protocol.

7. Using a **stirring hotplate**, heat the **completely reconstituted Universal Bioink™** (containing the **Bioink Photoinitiator: LAP**) to 38 ± 2 °C while gently stirring (300-500 rpm) until a homogenous mixture is obtained.
8. Once the **Bioink Photoinitiator: LAP** and **Universal Bioink™** solutions are fully incorporated, the **completely reconstituted Universal Bioink™** is ready to use.

Guidelines for Reuse

Store any unused **completely reconstituted Universal Bioink™** in a sealed amber container at 2 to 8 °C.

To reuse, heat the **completely reconstituted Universal Bioink™** to 38 ± 2 °C using a **stirring hotplate** with a **sterile magnetic stir bar** for 30 minutes or until any precipitated components have been fully dissolved.