LAP Solid Use Protocol and Tips

Overview:

Phenyl-2,4,6-trimethylbenzoylphosphinate (LAP) is a water soluble, non-cytotoxic photoinitiator that can initiate the solidification of Okagel. It helps to control Okagel in 3D bioprinting, cell culture, drug delivery, tissue engineering and biological device design.

LAP is visible light sensitive with its peak absorbance occurring of light with a wavelength of 400nm. This characteristic often makes LAP a desirable choice for cell-laden applications of Okagel; the successful polymerization initiator by LAP using visible improves cell viability in biological studies.

Protocol:

1. Determine the parameters required by the final Okagel solution:
    a. Final volume
    b. %w/v Okagel
    c. % concentration LAP
- For example, 10mL of 5% w/v Okagel with 0.5% LAP concentration is required.
2. Based on the requirements above, determine the amount of Okagel and LAP required.
    - for 10mL final volume, use 0.5g of Okagel Solid and 0.05g of LAP.
3. Prepare LAP stock solution - it is recommended this concentration be between 0.05% and 1.0% w/v.
    a. Add LAP solid to a volume of PBS that corresponds to 20% of the final volume of Okagel.
        i. For 10mL of final solution, dissolve 0.05g in 2mL PBS.
    b. Place LAP/PBS at room temperature and vortex. If not dissolving easily, place in a 50°C water bath for 20 mins.
    c. If sterile final product is required, sterile filter the solution in a biosafety cabinet.
4. Prepare precursor Okagel solution.
    a. Add Okagel Solid to a volume of PBS that corresponds to 80% of the final volume of Okagel.
        i. For 10mL of final solution, dissolve 0.5g in 8mL PBS.
5. Transfer the LAP solution to the Okagel solution.
6. Mix well for ~15 minutes at 40°C.
7. Store the final Okagel/LAP solution at 4°C.