Calculating Growth Factor Dilutions

Purpose

The amount of a growth factor needed in cell media is often so small that its mass cannot be accurately measured on a scale. Therefore, growth factors are put into solutions at a concentration feasible for pipetting.

General steps for making growth factor solutions

1. Determine the amount of growth factor needed (mass of growth factor per mL media) and the stock concentration recommended.
    a. If no stock concentration is recommended, choose a concentration at which the mass per mL media will be feasible to pipette.

2. Calculate the volume to dilute the growth factor in which will yield the recommended concentration. Noggin is used in the following example:

    The goal is to make 100ug/mL Noggin given 50ug Noggin.
    50ug Noggin / x mL = 100ug/1mL
    50 = 100x
    x = 0.5mL

3. Mix the growth factor with the calculated volume of filtered 0.1% BSA (unless otherwise indicated on the manufacturer's website… some growth factors are not soluble in BSA and require a different solvent).
    a. First, pipette some of the BSA into the vial containing the powdered growth factor. Pipette up and down to mix. Remove to a screw-top eppendorf.
    b. Pipette the rest of the BSA into the vial containing the remnants of the powdered growth factor. Mix. Remove to the eppendorf. Mix.

4. Aliquot out smaller amounts of the stock solution into separate screw-top eppendorfs. Label with growth factor name, date, and your initials. Freeze at -20°C to store. Once defrosted, aliquots are good for about 1 week and cannot be refrozen.

Note: Some growth factors arrive in liquid form and may need to be diluted/aliquoted before use. Ex. 1-thioglycerol comes as a liquid of concentration 1.25 mg/mL. Dilution in PBS at 1/100 ratio results in stock solution at 12.5 ug/mL.