**Synthesis of colloidal dextran-conjugated superparamagnetic iron nanoparticles (SPIONs)**

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**Abstract**

This method describes the synthesis and usage of dextran-conjugated superparamagnetic iron nanoparticles (SPIONs)

**Keywords:**

Dextran-conjugated superparamagnetic iron nanoparticles (SPIONs), lysosome purification, organelle purification, synthesis

**Synthesis of colloidal dextran-conjugated superparamagnetic iron nanoparticles (SPIONs)**

**Solutions to prepare**

1.2 M FeCl2 in MilliQ water (10 mL)

1.8 M FeCl3­ in MilliQ water (10 mL)

30% NH4OH in MilliQ water (10 mL)

0.3 M HCl in MilliQ water (80 mL)

**Protocol**

1. Combine 10 mL 1.2 M FeCl2 and 10 mL 1.8 M FeCl3­ in a 500 mL glass beaker with magnetic stirring.
2. Slowly add 10 mL of 30% NH4OH and stir for 5 minutes.

**NOTE**: During the addition of 30% NH4OH, a dark brown sludge should form.

1. Place the beaker on a strong magnet and allow the particles to migrate towards the magnet.
2. Remove supernatant, remove beaker from magnet, and resuspend particles in 100 mL of MilliQ water.
3. Repeat this wash step two more times.
4. Place beaker back on magnet, remove supernatant, resuspend particles in 80 mL of 0.3 M HCl, and stir for 30 minutes.
5. Add 4 g of dextran and stir for 30 minutes.
6. Transfer particles to dialysis bags and dialyze for 48 hours in MilliQ water. Change water approximately every 12 hours.
7. Centrifuge the resulting mixture at 19,000 g for 15 minutes to remove large aggregates.
8. Collect supernatant and store at 4˚C.