

# FerroMag™ 10 nm PEG Stabilized Iron Oxide (II, III) Magnetic Nanoparticles



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## PRODUCT INFORMATION

Product Name: FerroMag™ 10 nm PEG stabilized iron oxide (II, III) magnetic nanoparticle solution  
Catalog Number: 9010, 9010A  
Quantity: 1 mL (concentration 5 mg Fe/mL)  
Appearance: Dark brown solution  
Storage: Upon receipt store product at  $\leq -20^{\circ}\text{C}$ . Product is shipped at ambient temperature.  
Revision: 2.0 (January 2018)

### Introduction

FerroMag™ is a highly biocompatible, non-toxic formulation of surface-stabilized iron oxide ( $\text{Fe}_3\text{O}_4$ ) magnetic nanoparticles (MNPs). The particles are very well tolerated ( $\text{MTD}_{50} > 1.0\text{g Fe/kg body weight}$ ) and have been shown to be very active as a hyperthermia treatment for cancer therapy in mice<sup>1</sup>. After EPR leakage into subcutaneous tumors, exposure to a localized alternating magnetic field (980 kHz and 38 kA/m) resulted in rapid heating of the tumors without significant heating of surrounding tissue, resulting in durable tumor ablation.

### Contents

Each vial of FerroMag™ contains 5 mg of iron in the form of  $\sim 10$  nm iron oxide ( $\text{Fe}_3\text{O}_4$ ) nanoparticles (this is the weight of the iron, and does not include the weight of the oxygen atoms or surface-stabilizing ligand shell surrounding the magnetite core). It is supplied at a concentration of 5 mg Fe/mL in 1 mL water.

### Physical Properties

The magnetic nanoparticles are brown to yellow-brown in color and soluble in aqueous solutions. They are also soluble in up to 50% acetone, which reduces surface tension for applying evenly to EM grids, as well as 50% DMF and 50% DMSO.

### Storage

The product is shipped at ambient temperature. Store product  $-20^{\circ}\text{C}$  or  $-80^{\circ}\text{C}$  upon receipt. After thawing, the liquid product can be kept at  $4^{\circ}\text{C}$  for at least one month.

## INSTRUCTIONS FOR USE

FerroMag™ is supplied as a 5 mg Fe/mL solution in water. It can be diluted to the desired concentration in water, PBS or other common buffers. For long-term storage or concentrated solutions it is recommended to quick freeze in liquid nitrogen for storage at  $-20$  or  $-80^{\circ}\text{C}$  to avoid aggregation.

If desired, FerroMag™ may be concentrated using using Amicon (Millipore) type filters (50,000 or 100,000 MWCO; low amounts of product will pass through 100,000 MWCO filters). Samples may become viscous near 150 mg/mL. Make 0.5X

in phosphate buffered saline (PBS: 20 mM phosphate, 150 mM NaCl, pH 7.4) for injection into animals using e.g. a 10 X PBS stock solution. Samples may become viscous near 150 mg Fe/mL. A sample in phosphate buffered saline (PBS: 20 mM phosphate, 150 mM NaCl, pH 7.4) is prepared for animal injection by adding e.g. 10X PBS stock. We recommend passing through a 0.2 µm filter immediately before injecting into animals. A typical volume for intravenous injection into a mouse (for example, into the tail vein) is 0.2 mL. Based on a dose of 1.7 g Fe/kg body weight<sup>1</sup>, a 20 g mouse should be injected with approximately 35 mg of FerroMag™ at 130 mg Fe/mL.

### **Reference**

1. Huang, H. S., and Hainfeld, J. F.: Intravenous magnetic nanoparticle cancer hyperthermia. *Int. J. Nanomed.*, **8**, 2521-2532 (2013). doi: 10.2147/IJN.S43770. Epub 2013 Jul 17. PMID: 23901270.
  - [Free full-text access in PubMed.](#)
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Technical Assistance Available.

For a complete list of references citing our FerroMag™ products, please visit our world-wide-web site at:

<http://www.nanoprobes.com/references/>