viscover

FeraSpin™ R

MRI agent for pre-clinical imaging

1 vial (5 x 100 µL injections) # 130-095-138
5 vials (25 x 100 µL injections) # 130-095-139

Contents

1. Description

Components **850 µL FeraSpin™ R,**
MRI agent (superparamagnetic iron oxide [SPIO] nanoparticles)
or
5 × 850 µL FeraSpin™ R,
MRI agent (superparamagnetic iron oxide [SPIO] nanoparticles).

Capacity **5 × 100 µL injections**
or
25 × 100 µL injections.

Product format FeraSpin R is supplied as a sterile isotonic solution with an iron concentration of 5 mM.

Appearance Clear, amber liquid.

Storage Store at 2–8 °C. Do not freeze. The expiration date is indicated on the vial label.

For laboratory and animal research use only. Warning: Not for human or animal therapeutic or diagnostic use. Make sure to comply with all laws and regulations governing research on animals.

1.1 Background information

FeraSpin R is a nanoparticulate superparamagnetic iron oxide imaging agent specifically formulated for pre-clinical magnetic resonance imaging (MRI).
It is an imaging agent of high relaxivity enhancing the contrast in T_2- and T_2*-weighted MRI due to a shortening of the spin-spin relaxation time (T_2).
Upon intravenous injection, FeraSpin R is rapidly taken up by the Kupffer cells (macrophages of the liver) resulting in a short blood half-life of a few minutes.

FeraSpin R accumulates particularly in the liver and spleen and is degraded with its iron being transferred into the physiological iron stores.

1.2 Applications

FeraSpin R is indicated for use in MRI of small animals, for example mice, to facilitate the visualization of the liver and spleen. Examples include imaging of liver tumors and metastases. SPIO nanoparticles like FeraSpin R can also be useful for detection of bone marrow metastases.

1.3 Physico-chemical properties

Mean particle size: 60 nm (hydrodynamic diameter).
Particle size range: 10–90 nm.

Relaxivity (37 °C, 1.41 T) in water	Relaxivity (37 °C, 1.5 T#) in plasma	Relaxivity (37 °C, 1.5 T#) in water
r_1 = 10 L mmol^{-1} s^{-1} r_2 = 185 L mmol^{-1} s^{-1}	r_1 = 7 L mmol^{-1} s^{-1} r_2 = 95 L mmol^{-1} s^{-1}	r_1 = 9 L mmol^{-1} s^{-1} r_2 = 61 L mmol^{-1} s^{-1}

#measured with clinical device

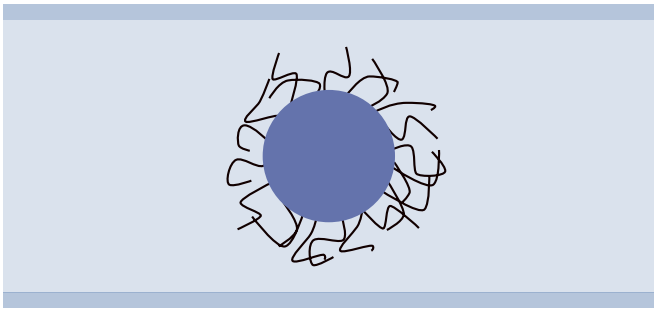

Figure 1: Schematic diagram of a FeraSpin R nanoparticle.

1.4 Requirements

- Sterile syringes and needles (27–30 G)
  Note: To allow sufficient volume for 5 × 100 µL injections per vial, the syringe/needle dead volume should be kept below 70 µL.
  Tip: Use insulin or tuberculin syringes.
- 70 % ethanol

2. Protocol

2.1 Preparation

- Read the entire protocol before starting.
  Tip: For optimum device settings perform initial studies in a suitable imaging phantom.
- The imaging agent is ready for injection as provided.

140-002-864.03

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- For a mouse weighing 20–30 g the typical injection volume is 100 µL corresponding to a dose of 20 µmol Fe/kg body weight (for a 25 g mouse).

  Note: Standard animal-handling procedures and local regulations must be followed.

2.2 Injection

- Vortex the vial to ensure thorough mixing.
- Disinfect the septum with 70% ethanol. Let septum dry.
- Warm the mouse tail to dilate the veins and enhance their visibility.
- Inject FeraSpin R (typically 100 µL) via the lateral tail vein of the mouse.

  Note: FeraSpin R contains no preservatives. Avoid microbial contamination and discard any unused material after 24 hours.

2.3 Imaging

- Imaging can be performed on a multitude of devices at all commonly used field strengths including high-field MRI.
- FeraSpin R is particularly suited for T_2- and T_2*-weighted MRI but can also be detected by T_1-weighted sequences.
- Taking a pre-contrast image is recommended.
- Prior to liver and spleen imaging, a waiting period of 10 minutes, preferably 30–60 minutes, is recommended.

Find examples of FeraSpin R-enhanced MR images at **www.viscover.berlin**.

3. References

1. Reichardt, W. *et al.* (2013) Phase Contrast MR Imaging to Image Bacterial translocation in a Mouse Model for Graft versus Host Disease. Proc. Intl. Soc. Mag. Reson. Med. 21, Salt Lake City, Utah, USA.
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3. Murakami, T. *et al.* (2001) Evaluation of regional liver damage by magnetic resonance imaging with superparamagnetic iron oxide in rat liver. Dig. Dis. Sci. 46: 148–155.
4. Tsuda, N. *et al.* (2005) Potential of superparamagnetic iron oxide in the differential diagnosis of metastasis and inflammation in bone marrow: experimental study. Invest. Radiol. 40: 676–681.
5. Metz, S. *et al.* (2004) Capacity of human monocytes to phagocytose approved iron oxide MR contrast agents in vitro. Eur. Radiol. 14: 1851–1858.
6. Kuhlpeter, R. *et al.* (2007) R2 and R2* mapping for sensing cell-bound superparamagnetic nanoparticles: in vitro and murine in vivo testing. Radiology 245: 449–457.
7. Rohrer, M. *et al.* (2005) Comparison of magnetic properties of MRI contrast media solutions at different magnetic field strengths. Invest. Radiol. 40: 715–724.

4. Related products

FeraSpin™ XS	# 130-095-140, # 130-095-141
FeraSpin™ S	# 130-095-166, # 130-095-167
FeraSpin™ M	# 130-095-168, # 130-095-169
FeraSpin™ L	# 130-095-170, # 130-095-171
FeraSpin™ XL	# 130-095-172, # 130-095-173
FeraSpin™ XXL	# 130-095-174, # 130-095-175
GadoSpin™ M	# 130-095-134, # 130-095-135
GadoSpin™ P	# 130-095-136, # 130-095-137
GadoSpin™ F	# 130-095-162, # 130-095-163
GadoSpin™ D	# 130-095-164, # 130-095-165

A comprehensive product portfolio for the imaging modalities MRI, CT, US, OI, SPECT, and PET is available at **www.viscover.berlin**.

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