viscover

NiraWave™ M

Optical imaging agent for pre-clinical imaging

1 vial (5 x 100 µL injections) # 130-095-156
5 vials (25 x 100 µL injections) # 130-095-157

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1. Description

Components **2 mg NiraWave™ M,** optical imaging agent; **1 mL NiraWave™ M,** reconstitution medium
or
5 × 2 mg NiraWave™ M, optical imaging agent; **5 × 1 mL NiraWave™ M,** reconstitution medium.

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

Product format NiraWave M is supplied as a lyophilized preparation and a reconstitution medium. After reconstitution an isotonic micellar indocyanine green (ICG) solution is formed having an ICG concentration of 100 mg/L.

Appearance Green lyophilizate and clear, colorless liquid after homogenization. Reconstituted: Clear, green liquid.

Storage Store protected from light 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

NiraWave M is a micellar near-infrared (NIR) fluorescence imaging agent exhibiting a prolonged blood circulation and high quantum yield specifically formulated for pre-clinical optical imaging (OI).
NiraWave M shows absorption and emission (fluorescence) in the NIR spectral range allowing an increased tissue penetration.

Due to the micellar formulation of indocyanine green, NiraWave M exhibits a stronger fluorescence, higher aqueous stability and prolonged blood circulation time. NiraWave M is excreted by the liver within hours.

1.2 Applications

NiraWave M is indicated for use in OI of small animals, for example mice, to facilitate the visualization of the vasculature. Examples include fluorescence angiography, particularly for the visualization of the microcirculation as well as visualization of vascular leakage in inflammation.

1.3 Physico-chemical properties

Micelle size	$\lambda_{Emission}$	$\lambda_{Excitation}$
~ 11 nm	830 nm	660 - 790 nm

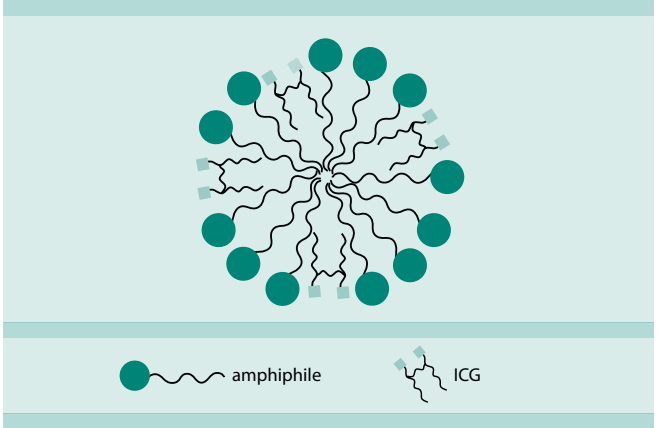

Figure 1: Schematic diagram of NiraWave M.

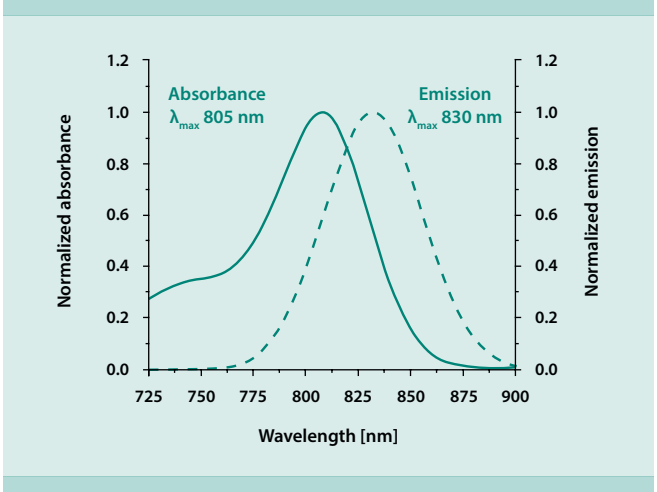

Figure 2: Normalized absorption and emission spectra of NiraWave M in plasma.

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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.
- Homogenize NiraWave M reconstitution medium by warming (50 °C) and gentle mixing.
- To reconstitute the NiraWave M lyophilizate, inject 850 µL of the NiraWave M reconstitution medium into the vial. Gently agitate the vial until a clear, green solution is obtained.
- For a mouse weighing 20–30 g the typical injection volume is 100 µL corresponding to a dose of 0.4 mg ICG/kg body weight (for a 25 g mouse).

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

2.2 Injection

- Reconstitute the NiraWave M lyophilizate prior to injection as described in section 2.1.
- Disinfect the septum with 70% ethanol. Let septum dry.
- Warm the mouse tail to dilate the veins and enhance their visibility.
- Inject NiraWave M (typically 100 µL) via the lateral tail vein of the mouse.

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

2.3 Imaging

- Follow the imaging protocol as recommended by the manufacturer of your imaging system.
- To maximally excite NiraWave M, the excitation wavelength must be at least 40 nm below the emission maximum of the dye.
- The recommended excitation and emission wavelengths of NiraWave M are noted in section 1.3.
- Imaging can be performed immediately and over an extended time period after injection.

Find examples of NiraWave M-enhanced optical images at **www.viscover.berlin**.

3. References

1. Kirchherr, A. K. *et al.* (2009) Stabilization of indocyanine green within micellar systems. Mol. Pharmaceutics. 6: 480–491.
2. Kirchherr, A. K. (2010) Herstellung und Charakterisierung kolloidaler Formulierungen für Indocyaningrün als Kontrastmittel für die optische Bildgebung. PhD thesis.
3. Schwenck, J. *et al.* (2016) Fluorescence and Cerenkov luminescence imaging. Nuklearmedizin 55(2): 63–70.
4. Meyer, J. *et al.* (2012) In Vivo Imaging Of A New Indocyanine Green Nanoformulation In An Animal Model. IOVS 53: 4991.
5. Meyer, J. *et al.* (2014) In Vivo Imaging of a New Indocyanine Green Micelle Formulation in an Animal Model of Laser-Induced Choroidal Neovascularization. IOVS 55: 6204-6212.

4. Related products

NiraWave™ C	# 130-095-154, # 130-095-155
NiraWave™ Rocker	# 130-095-158, # 130-095-159
NiraWave™ nano 780	# 130-095-695, # 130-095-693

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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