

NiraWave™ C

Optical imaging agent for pre-clinical imaging

1 vial (5 x 100 µL injections)

130-095-154

5 vials (25 x 100 µL injections)

130-095-155

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1. Description

- Components** 50 mg NiraWave™ C, optical imaging agent (indocyanine green) or 5 x 50 mg NiraWave™ C, optical imaging agent (indocyanine green).
- Capacity** 5 x 100 µL injections after reconstitution or 25 x 100 µL injections after reconstitution.
- Product format** NiraWave C is supplied as a lyophilized preparation. After reconstitution, the isotonic solution has an indocyanine green (ICG) concentration of 250 mg/L.
- Appearance** Green lyophilizate. Reconstituted: Clear, green liquid.
- Storage** Store protected from light at 2–8 °C. The expiration date is indicated on the vial label.

NiraWave C is supplied as a lyophilized preparation. After reconstitution, the isotonic solution has an indocyanine green (ICG) concentration of 250 mg/L.

Green lyophilizate. Reconstituted: Clear, green liquid.

Store protected from light at 2–8 °C. 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 C is a near-infrared (NIR) fluorescence imaging agent with high protein-binding affinity specifically formulated for pre-clinical optical imaging (OI). It shows absorption and emission (fluorescence) in the NIR spectral range allowing an increased tissue penetration.

Upon intravenous injection, NiraWave C rapidly binds to plasma proteins and is excreted unchanged by the liver. The plasma clearance is biphasic with an initial half-life of 3–4 minutes and a secondary half-life of more than 1 hour.

1.2 Applications

NiraWave C is indicated for use in OI of small animals, for example mice, to facilitate the visualization of the vasculature. Examples include fluorescence angiography.

1.3 Physico-chemical properties

Molecular weight	$\lambda_{\text{Emission}}$	$\lambda_{\text{Excitation}}$
775 g/mol	820 nm	650 - 780 nm

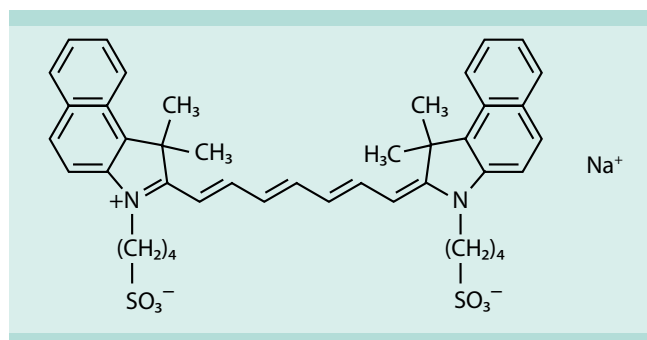


Figure 1: Structural formula of indocyanine green.

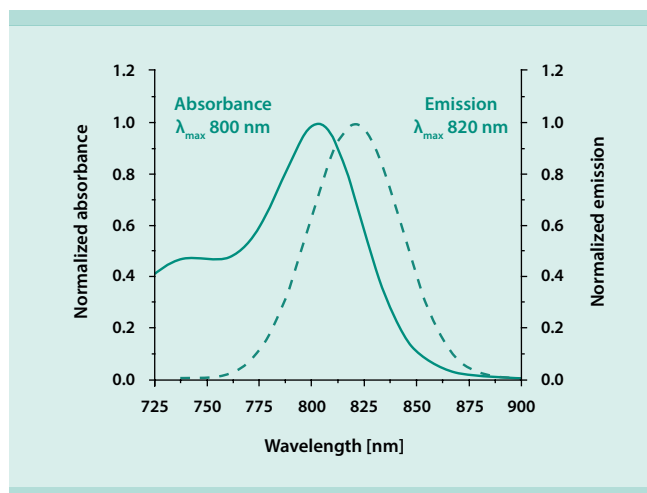


Figure 2: Normalized absorption and emission spectra of NiraWave C in plasma.

1.4 Requirements

☞ Sterile syringes and needles (27–30 G)

Note: To allow sufficient volume for $5 \times 100 \mu\text{L}$ injections per vial, the syringe/needle dead volume should be kept below $70 \mu\text{L}$.

Tip: Use insulin or tuberculin syringes.

☞ 70 % ethanol

☞ Sterile water for injection (WFI)

2. Protocol

2.1 Preparation

☞ Read the entire protocol before starting.

☞ To reconstitute the lyophilizate, inject $850 \mu\text{L}$ of sterile water for injection (WFI) into the vial. Do not use saline solution! Gently agitate the vial until a clear, green solution is obtained.

☞ For a mouse weighing 20–30 g the typical injection volume is $100 \mu\text{L}$ corresponding to a dose of 1.0 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 C 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 C (typically $100 \mu\text{L}$) via the lateral tail vein of the mouse.

Note: Use NiraWave C immediately after reconstitution. Discard any unused material after 8 hours.

2.3 Imaging

☞ Follow the imaging protocol as recommended by the manufacturer of your imaging system.

☞ To maximally excite NiraWave C, the excitation wavelength must be at least 40 nm below the emission maximum of the dye.

☞ The recommended excitation and emission wavelengths of NiraWave C are noted in section 1.3.

☞ Begin imaging immediately after injection.

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

3. References

1. Lao, W. W. *et al.* (2014) A new rat model for orthotopic abdominal wall allotransplantation. *Plast Reconstr Surg Glob Open*. 2(4): e136.
2. Abels, C. *et al.* (2000) Indocyanine green (ICG) and laser irradiation induce photooxidation. *Arch. Dermatol. Res.* 292: 404–411.
3. Reynolds, J. S. *et al.* (1999) Imaging of spontaneous canine mammary tumors using fluorescent contrast agents. *Photochem. Photobiol.* 70: 87–94.
4. Li, X. *et al.* (1995) Tumor localization using fluorescence of indocyanine green (ICG) in rat models. *Proc. SPIE*. 2389: 789–797.
5. Bäuml, W. *et al.* (1999) Photo-oxidative killing of human colonic cancer cells using indocyanine green and infrared light. *Br. J. Cancer*. 80: 360–363.

4. Related products

NiraWave™ M	# 130-095-156, # 130-095-157
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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