

Product Data Sheet

Product Name: Iohexol
Cat. No.: GC16105

Chemical Properties

Cas. No. 66108-95-0

Chemical Name (1Z,3Z)-N'1,N'3-bis(2,3-dihydroxypropyl)-5-(N-(2,3-dihydroxypropyl)acetamido)-2,4,6-triiodoisophthalimidic acid

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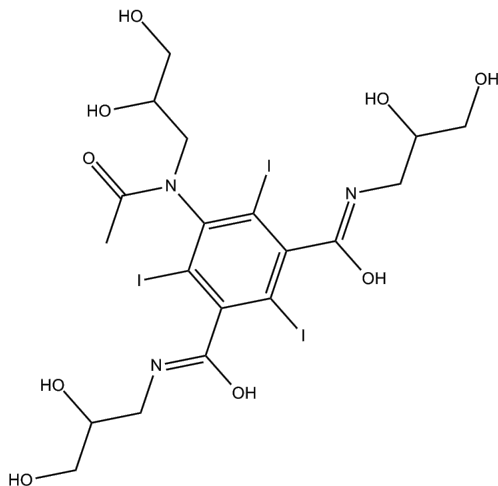
Formula $C_{19}H_{26}I_3N_3O_9$ M.Wt 821.14

Solubility $\geq 31.85\text{mg/mL}$ in DMSO Storage 4°C , protect from light

General tips For obtaining a higher solubility, please warm the tube at 37°C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Dynamic Contrast Enhanced Micro-CT Angiography Protocol

1. Pre-experiment Preparation

- (1) Weigh BALB/c mice (8-12 weeks old), and calculate the Iohexol dose: $25\mu\text{L/g}$ ($=7.5\text{mg/g}$).
- (2) Prepare the anesthetic mixture, sterilize with a $0.2\mu\text{m}$ filter, store the mixture in the dark at 4°C ,

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and use immediately after preparation.

(3) 5ml of Iohexol (300mg/ml) is added to 5ml of sterile saline and mixed to obtain 10ml of 150mg/ml working solution, sterilized with a 0.2 μ m filter, stored in the dark, and used immediately after preparation.

(4) Draw Iohexol into a 1ml syringe, expel air bubbles, and attach Iohexol to the injection pump. Set the flow rate: total injection volume (μ l) = 25 μ l $\times$ body weight (g). Injection time = 45s $\rightarrow$ flow rate (μ l/s) = total volume/45.

(5) Fix the mouse on a heating pad (37°C), and monitor the rectal temperature in real time to maintain it at 36.5-37.5°C.

2. Intravenous Injection

(1) Wipe the mouse tail's posterior 1/3 with an alcohol swab, and use an infrared lamp to assist in dilating the tail vein.

(2) Insert the indwelling needle, confirm the return of blood, and fix; connect the other end of the catheter to the injection pump extension tube filled with Iohexol.

(3) Slowly inject 20 μ l of 0.9% NaCl to verify that the channel is unobstructed without leakage.

3. Dynamic Contrast Scanning Procedure

(1) First, collect the "pre-contrast" baseline sequence (example parameters: 80kV; 500 μ A; 360-degree projection; 10min).

(2) Start the scan and trigger the injection pump simultaneously; immediately begin the first round of "post-contrast" scan after the injection is completed (45s).

(3) Repeat the post-contrast scan every 50s for a total of 5 periods; the entire process takes approximately 4.5min.

(4) After the scan, slowly remove the needle, apply local pressure to stop bleeding for 30s; place the mice on the heating pad to recover, and return the mice to the cage once the righting reflex returns.

4. Postoperative Observation

(1) Observe breathing, skin color, and activity at 0, 30, and 60min, record any adverse reactions (convulsions, respiratory depression, etc.).

(2) Provide 5% glucose water within 24h to aid iodine excretion.

(3) If multiple contrast scans are needed, the interval should be $\geq$ 72h, and monitor serum creatinine to assess renal function.

5. Precautions

(1) Iohexol is a low-osmolar non-ionic contrast agent and can be stored at room temperature; check for crystallization before use, and if present, dissolve Iohexol in a 37°C water bath.

(2) The depth of anesthesia should be such that there is no withdrawal reflex when the toe is pinched;

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too deep anesthesia can cause respiratory depression, and too shallow can result in motion artifacts.
(3) If the experimental period is > 1h, administer 0.3ml of warm saline intraperitoneally every 20min to prevent dehydration and hypotension.

References:

[1] Yan D, Zhang Z, Luo Q, et al. A novel mouse segmentation method based on dynamic contrast enhanced micro-CT images[J]. PLoS One, 2017, 12(1): e0169424.

Background

Iohexol, a low osmolality nonionic contrast media, is a tri-iodinated benzene derivative with a molecular weight of 821.1Da^[1]. Iohexol is used as a marker of glomerular filtration rate (GFR) and as an alternative to radiotracer^[2].

In vitro, Iohexol treatment for 72 hours significantly inhibited the viability of CC-531 and AML12 cells, with IC₅₀ values of 46.6mM and 26.8mM, respectively^[3]. Treatment of HK-2 cells with 100mg/ml Iohexol for 24 hours significantly induced apoptosis, mitochondrial damage, and significantly inhibited cell migration^[4]. Treatment of NRK 52-E cells with 150mg/ml Iohexol for 12 hours resulted in massive cell death, resulting in numerous round vacuoles in the cytoplasm^[5].

In vivo, Iohexol treatment via single dose injection of 5μl (300mg/mL) into the left paw of mice for 15 minutes increased paw thickness and swelling, inducing a local anaphylactogenic reaction in mice^[6]. Intraperitoneal injection of a single dose of Iohexol (3g/kg) for 24h resulted in renal lesions in C57BL/6 mice, with vacuolization of the renal cortex and induction of proximal tubular inflammation^[7].

References:

[1] Seegmiller J C, Eckfeldt J H, Lieske J C. Challenges in measuring glomerular filtration rate: a clinical laboratory perspective[J]. Advances in chronic kidney disease, 2018, 25(1): 84-92.

[2] Brown S C W, O'reilly P H. Iohexol clearance for the determination of glomerular filtration rate in clinical practice: evidence for a new gold standard[J]. The Journal of urology, 1991, 146(3): 675-679.

[3] Melancon M P, Yevich S, Avritscher R, et al. A novel irinotecan-lipiodol nanoemulsion for intravascular administration: pharmacokinetics and biodistribution in the normal and tumor bearing rat liver[J]. Drug delivery, 2021, 28(1): 240-251.

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- [4] Xiao-Yan G O U, Yong L I, Xiao-Ping F A N. The Role of Mdivi-1 in Reducing Mitochondrial Fission via the NF- κ B/JNK/SIRT3 Signaling Pathway in Acute Kidney Injury[J]. Physiological Research, 2025, 74(1): 79.
- [5] Jensen H, Doughty R W, Grant D, et al. The effects of the iodinated X-ray contrast media iodixanol, iohexol, iopromide, and ioversol on the rat kidney epithelial cell line NRK 52-E[J]. Renal failure, 2011, 33(4): 426-433.
- [6] Yuan F, Zhang C, Sun M, et al. MRGPRX2 mediates immediate-type pseudo-allergic reactions induced by iodine-containing iohexol[J]. Biomedicine & Pharmacotherapy, 2021, 137: 111323.
- [7] Lee H T, Jan M, Bae S C, et al. A1 adenosine receptor knockout mice are protected against acute radiocontrast nephropathy in vivo[J]. American Journal of Physiology-Renal Physiology, 2006, 290(6): F1367-F1375.

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