

The First Commercially Available Dual MRI and PET Imaging Agent L-Tyrosine Coated Nanoparticles

BioPAL provides the research community with unique products for PET imaging, radiotherapy research, and MRI applications.

BioPAL provides a 40 nm particle coated with L-tyrosine. The phenol group of tyrosine is ideally suited for applications as a substrate for tyrosine kinases, iodination with ^{124}I (PET), ^{123}I (SPECT), ^{125}I (metabolic studies and autoradiographs), and ^{127}I (CT). This nanoparticle is designed not to independently bind to or be internalized by cells. Therefore, after iodination, the particle can be used as a vascular imaging agent for cardiovascular research and cancer imaging. This product is part of BioPAL's Molday ION family of MRI products. As a result, this product has an iron oxide core and therefore can also be used as a superparamagnetic contrast agent for MRI application, i.e., a dual PET/MRI imaging product.

NOT FOR HUMAN USE.

PET/MRI Nanoparticles

Nanoparticles designed for applications in PET imaging, radiotherapy research and MRI.

Catalog Number

CL-50Q02-162 Poly's L-Tyrosine Molday ION Phenol Terminated.....\$ 475.00

2.0 ml of 40 nm iron-based superparamagnetic contrast agent coated with L-tyrosine packaged in a 2 ml sealed serum bottle. 5 mg Fe/ml having a zeta potential of ~ -5 mV. The phenol group of tyrosine is ideally suited for applications as a substrate for tyrosine kinases, iodination with ^{124}I (PET), ^{123}I (SPECT), ^{125}I (metabolic studies), and ^{127}I (CT). This nanoparticle is designed not to independently bind to or be internalized by cells.
Applications: MRI, PET, SPECT, CT, Vascular Imaging, Metabolism studies, EM, Drug delivery, Theranostics.

GENERAL IODINATION PROTOCOL

Note: The operator should be trained in the safe use and handling of radioisotopes and hold an appropriate license if required by the local radiation safety authority.

MATERIALS

Reagents:

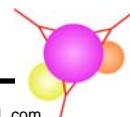
1. Poly's L-Tyrosine Molday ION Phenol Terminated (Cat #: CL-50Q02-162) 200 μg Fe/40ul.
2. $\text{Na}^{(125)\text{I}}$ or other iodine isotope (~1 mCi/10 μl) on the day of iodination, calculate the volume of $\text{Na}^{(125)\text{I}}$ to add to the iodination reaction given that 1 mCi of radioactive label should be added. The reference date and the specific activity of the $\text{Na}^{(125)\text{I}}$ will affect the volume of solution that is required.

Prepare Chloramine-T and sodium metabisulphite 10 minutes before use.

3. Chloramine-T / Sigma Aldrich: Dissolve 1mg in 10ml distilled water.
4. Sodium metabisulphite / Sigma Aldrich: Dissolve 1mg in 10ml distilled water.
5. Reaction buffer 0.5 M sodium phosphate, pH 8.
6. Chromatography solution: 150 mM sodium chloride (100ml).

Equipment:

1. Laboratory equipped for safe handling of radioisotopes containing a fume hood with powered exhaust and lead shielding.
2. 1 x 75mm glass tube or plastic chromatography column.
3. NAP-5 column GE Healthcare Catalog 17-0853-01.
4. 60 second timer.



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PROCEDURES

All materials should be equilibrated at room temperature before use.

Iodination Reaction

Note: The iodination reaction must be completed in a Type B laboratory or certified iodination laboratory in a fume hood.

1. Add 40 μl of CL-50Q02-162 to iodination tube (a virgin 12x75 glass tube).
2. Add 100 μl of reaction buffer.
3. Add approximately 1 mCi Na^{125}I (approximately 10 μl if the preparation is fresh) to the iodination reaction tube.
4. Add 20 μl of chloramine-T Solution, and start the timer.
5. Gently mix the contents of the iodination reaction tube.
6. Incubate for 60 seconds only.
7. Add 20 μl sodium metabisulphite to the iodination tube; mix gently.
8. Incubate the tube for 5 minutes.

Isolation of [^{125}I]-labeled CL-50Q02-162 from unreacted Na^{125}I .

1. Place a 12 x 75 mm glass tube under NAP-5 column. Load reaction mixture onto the column equilibrated with chromatography solution and allow reaction mixture to enter the column; add 600 μl of chromatography solution and allow to enter the column.
2. Add 3ml of chromatography solution to solution collected in 12x75 mm tube from step 2. Cap tube and store at 4°C in a shielded container.

