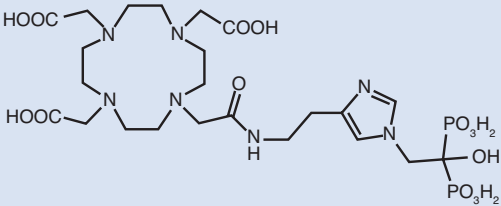


⁶⁸Ga-DOTA-Zoledronate

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Chemical name and alternative names	Chemical structure
2,2',2''-(10-(2-((2-(1-(2-hydroxy-2,2-diphosphono-ethyl)-1H-imidazol-4-yl)ethyl)-amino)-2-oxoethyl)-1,4,7,10-tetraazacyclo-dodecane-1,4,7-triyl)triacetic acid DOTA-ZOL; DOTA ^{ZOL}	

Route of Synthesis

Chelation of generator produced ⁶⁸Ga-chloride with DOTA-zoledronate in acetate buffer at elevated temperature, followed by cartridge purification (Meckel et al. 2017).

Normal Biodistribution and Excretion

High accumulation is seen in the skeleton as biological target and kidneys and bladder as organs of excretion. Faint accumulation is seen in liver, spleen, and salivary glands. Activity is seen in the renal parenchyma within 2.5 min of injection, but renal clearance is rapid and only minimal activity is evident at 45 min (Khawar et al. 2019).

Activity Administered

150 MBq.

Radiation Dosimetry

Effective dose equivalent (mSv/MBq): 0.017 (2.6 mSv/150 MBq).

Organ doses (mGy/MBq): urinary bladder wall, 0.37; osteogenic cells, 0.040; kidneys, 0.031 (Khawar et al. 2019).

Patient Preparation

The patient should be well hydrated to reduce the radiation dose to the kidneys and bladder.

Clinical Utility

It is anticipated that utility will be similar to ^{18}F -fluoride (though with much reduced radiation dose) and the $^{99\text{m}}\text{Tc}$ diphosphonate bone scan agents. In particular, may be useful prior to palliative therapy with ^{177}Lu - or ^{225}Ac -DOTA-ZOL (Meisenheimer et al. 2020).

Further Reading

- Khawar A, Eppard E, Roesch F, et al. Preliminary results of biodistribution and dosimetric analysis of [^{68}Ga]Ga-DOTA^{ZOL}: a new zoledronate-based bisphosphonate for PET/CT diagnosis of bone diseases. *Ann Nucl Med.* 2019;33:404–13.
- Meckel M, Bergmann R, Miederer M, et al. Bone targeting compounds for radiotherapy and imaging: *me(III)-DOTA conjugates of bisphosphonic acid, pamidronic acid and zoledronic acid. *EJNMMI Radiopharm Chem.* 2017;1:14.
- Meisenheimer M, Kürpig S, Essler M, et al. DOTA-ZOL: a promising tool in diagnosis and palliative therapy of bone metastasis—challenges and critical points in implementation into clinical routine. *Molecules.* 2020;25:2988.