

Radioisotope

Cu-67, Copper-67
Transition metal
T_{1/2} : 2.6 days

Production

Main methods

- **Reactor:** [⁶⁷Zn(n,p) ⁶⁷Cu]
- **Cyclotron:** [⁷⁰Zn(p,α) ⁶⁷Cu]
[⁶⁸Zn(p,2p) ⁶⁷Cu]
- **Photoconversion:** [⁶⁸Zn(γ,p) ⁶⁷Cu]
- **Accelerator :** [⁶⁴Ni(α,n) ⁶⁷Cu]

Radiation

Beta particles (β⁻)

Use

Under study for meningioma and possibility to be used for other somatostatin expressing neoplasms.

Target/Mechanism

SARTATE (MeCOSar-Octreotate) is a somatostatin analogue . When ⁶⁷Cu SARTATE binds to somatostatin receptors and is internalized in the tumor cell, β radiation emitted by copper-67 induces DNA breakage leading to cell death.

Insight

The initial results on the use of ⁶⁷Cu SARTATE ,and its imaging counterpart ⁶⁴Cu-SARTATE of imaging, in patients with unresectable multifocal meningioma were published (NCT03936426).

Objective

Evaluate the imaging, biodistribution, dosimetry, safety, and tolerability (time frame 55 w)

N patients

5 with somatostatin receptor-expressing lesions confined to the cranium, to allow normal-organ dosimetry in the remainder of the body.

Treatment

Max 5.1 GBq of ⁶⁷Cu-SARTATE for up to 4 cycles, 6-12 weeks apart.

Results

5 patients were PET/CT imaged, 3 of the subjects were administered 4 cycles each of ⁶⁷Cu-SARTATE followed by multiple SPECT/CT imaging, time points: 1, 4, 24 and 96 hours post-administration.

Dosimetry: estimated mean effective dose

$$^{64}\text{Cu-SARTATE} = 3.95 \times 10^{-2} \text{ mSv/MBq}$$

$$^{67}\text{Cu-SARTATE} = 7.62 \times 10^{-2} \text{ mSv/MBq}$$

Highest estimated organ dose in decreasing order: spleen, kidneys, liver, adrenals, small intestine.

Comparing PET and SPECT intrasubject imaging, the radiopharmaceuticals exhibited a notable alignment with tumor targets, highlighting its potential as a highly accurate and precise theranostic product for guiding therapy.

No serious adverse events were observed or led to withdrawal from the study.

Further clinical studies will be required to examine the therapeutic dose required and its safety.

