

# Technetium-99m tricarbonyl complexes containing amino acid derivatives for cancer imaging

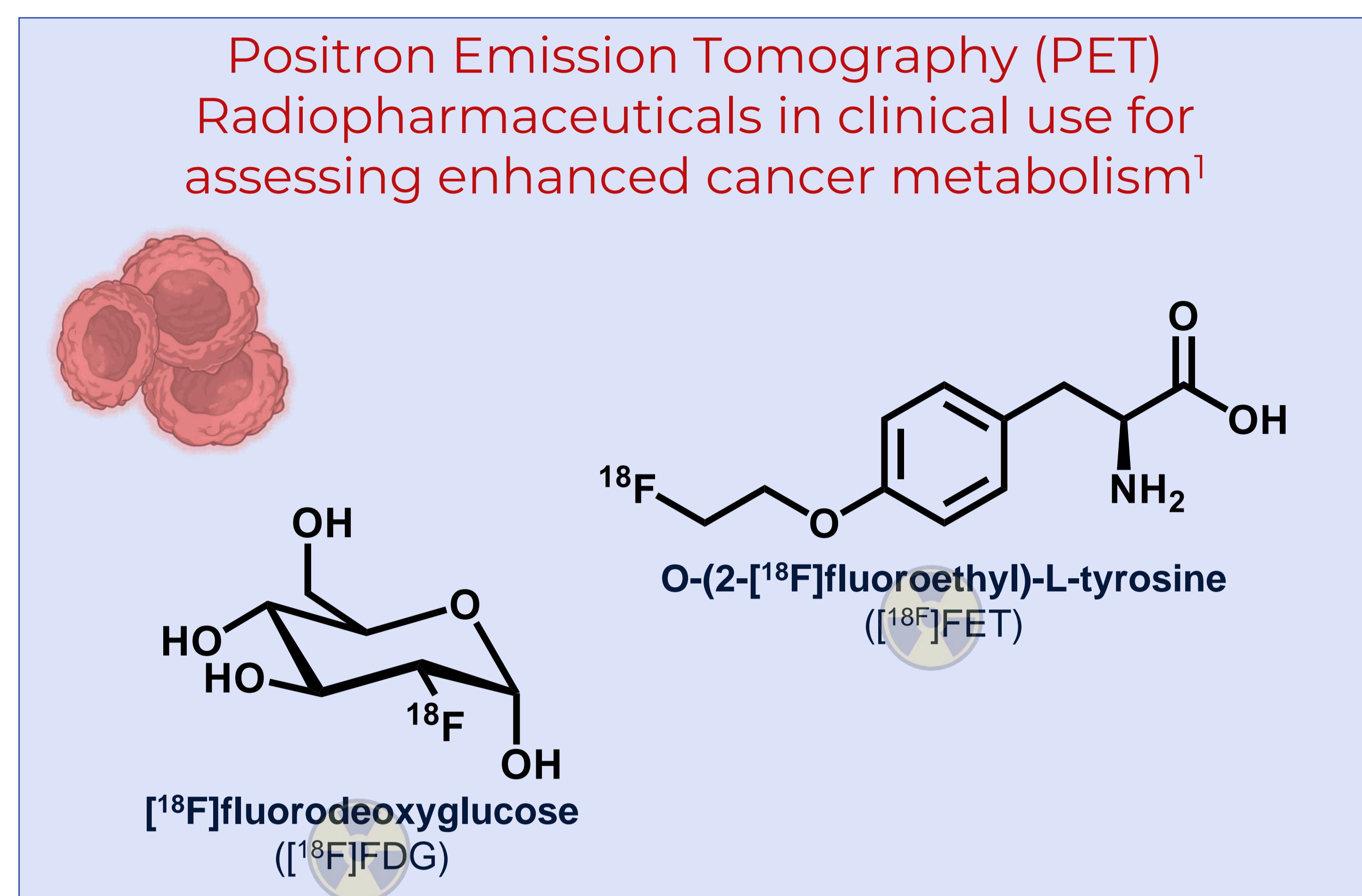
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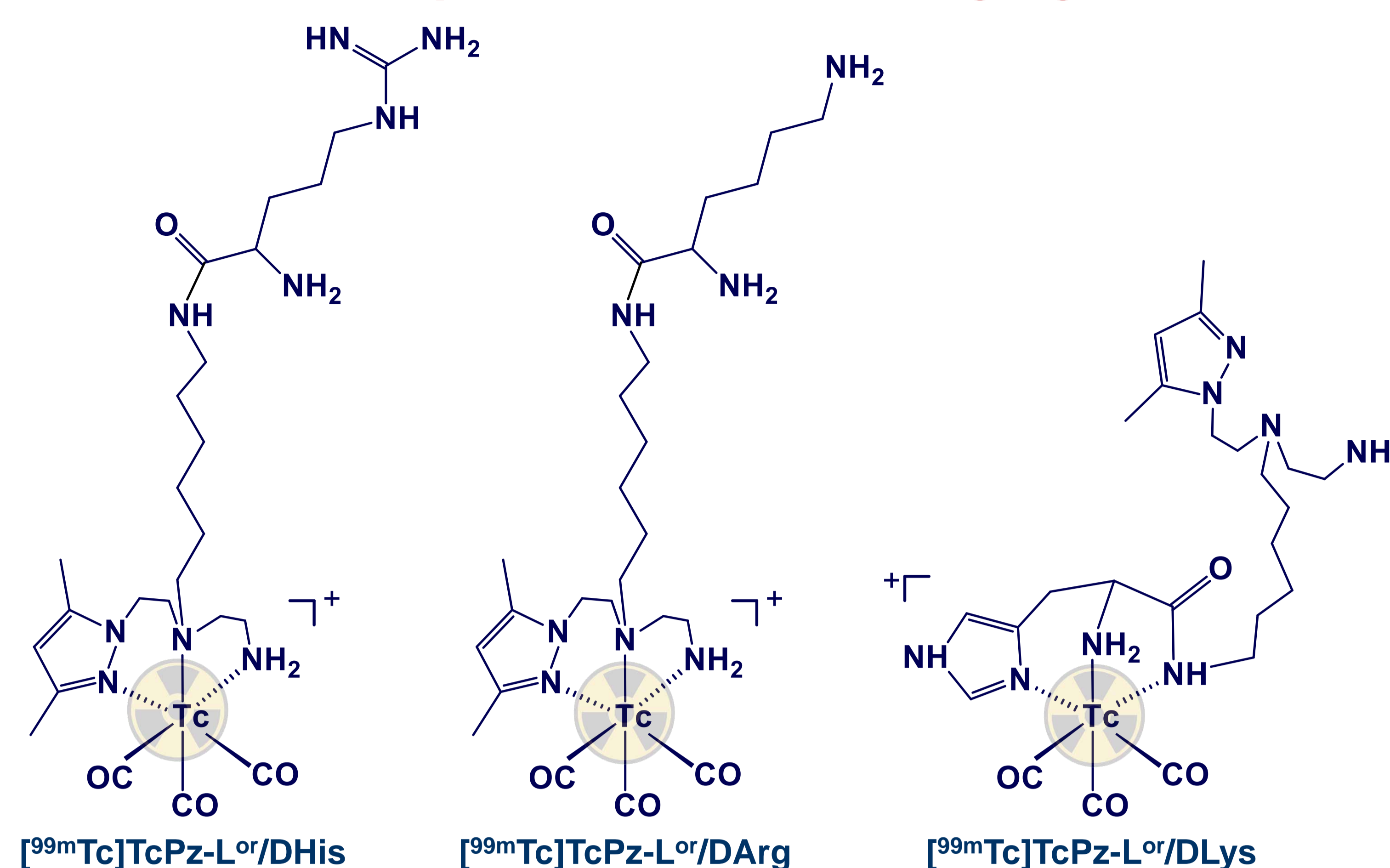
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<https://doi.org/10.17952/37EPS.2024.P1012>

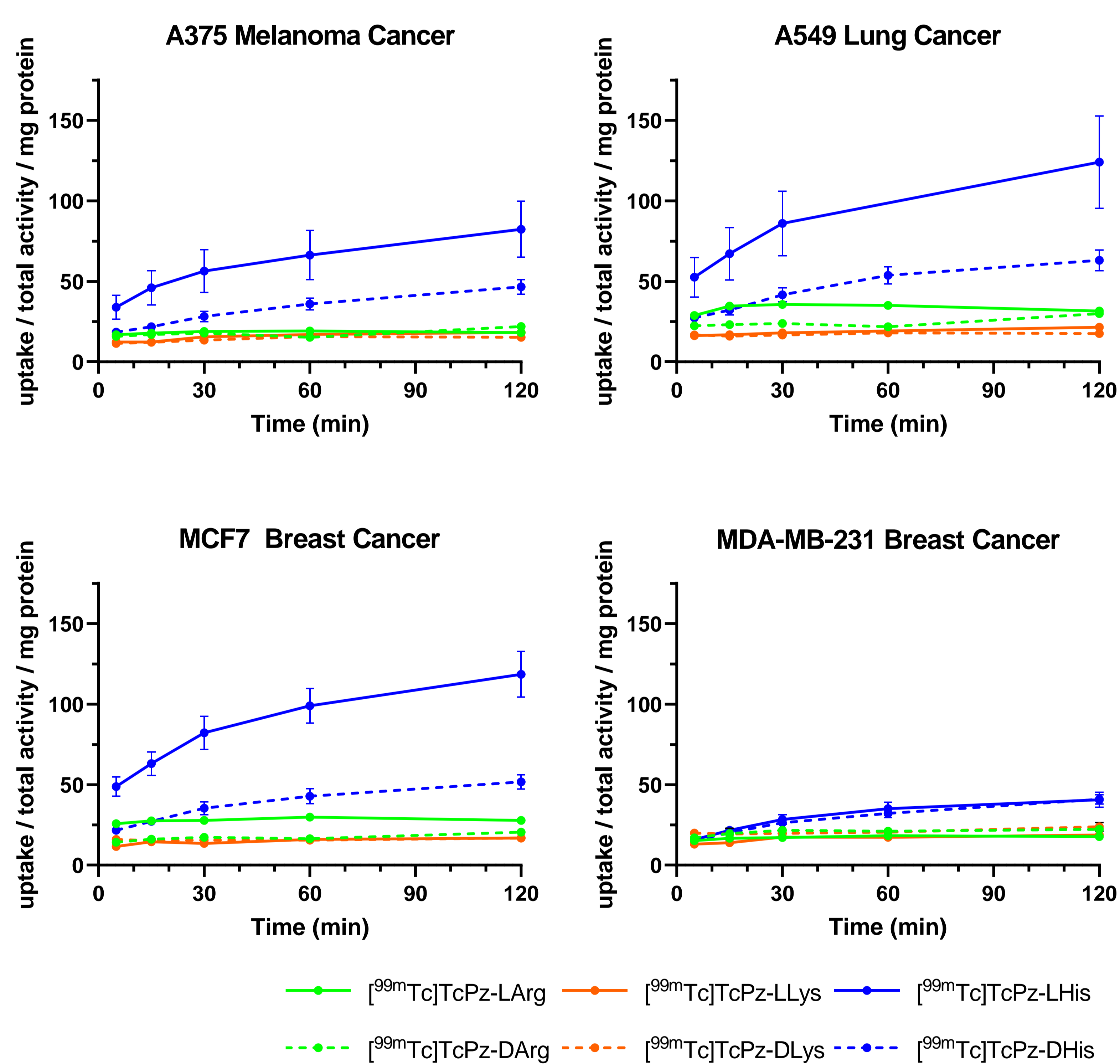


## <sup>99m</sup>Tc-(I)-complexes bearing cationic amino acids as potential cancer imaging tools

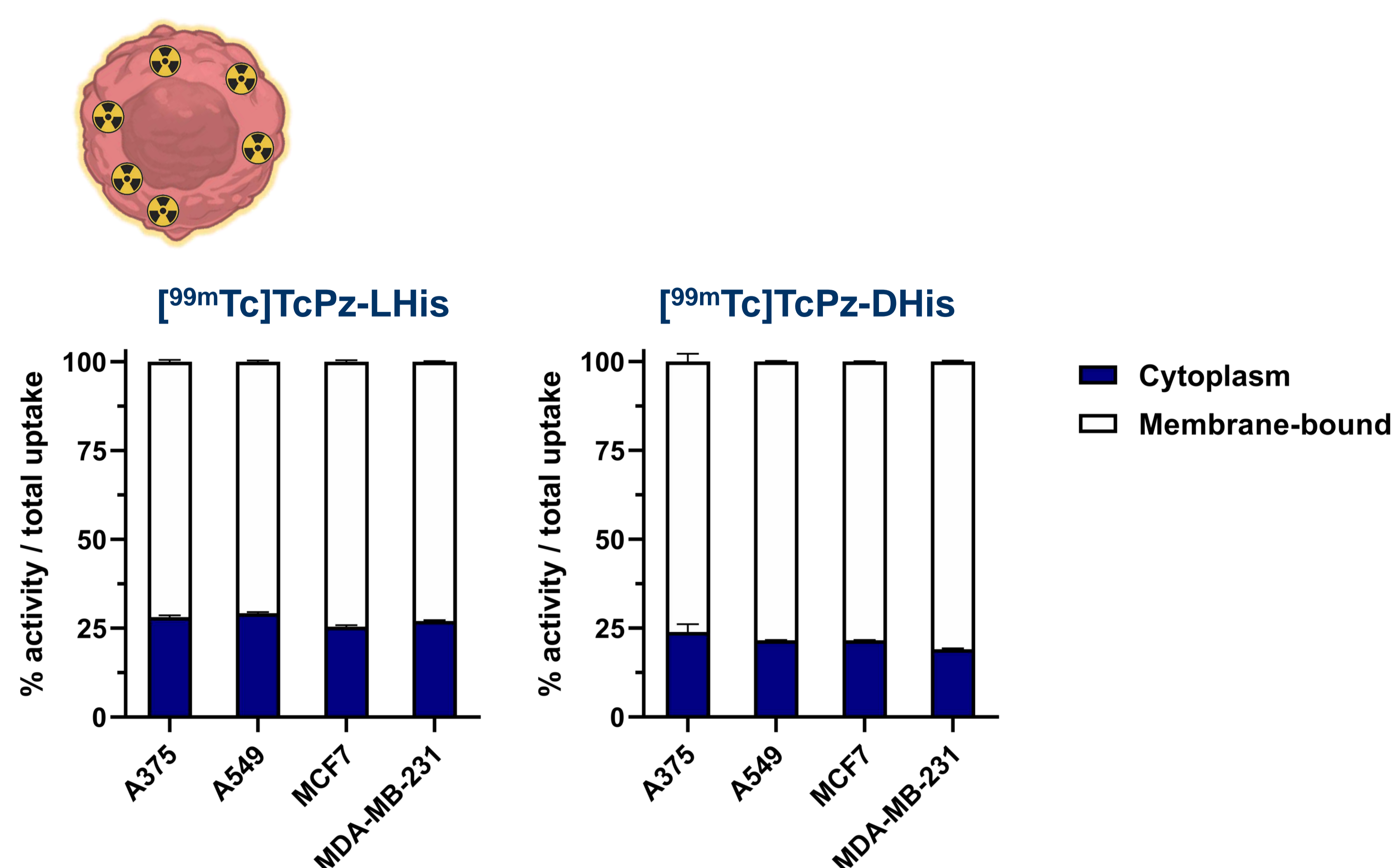


Design and biological evaluation of cationic amino acid (Aa)-bearing radiometal (technetium-99m, <sup>99m</sup>Tc) complexes to assess upregulation of amino acid transporters (e.g. Cationic Amino Acid Transporter 1, CAT 1, or Amino Acid Transporter B<sup>0+</sup>, ATB<sup>0+</sup>) *in vivo* by Single Photon Emission Computed Tomography (SPECT) for Cancer Imaging<sup>2,3</sup>.

### Cellular Uptake

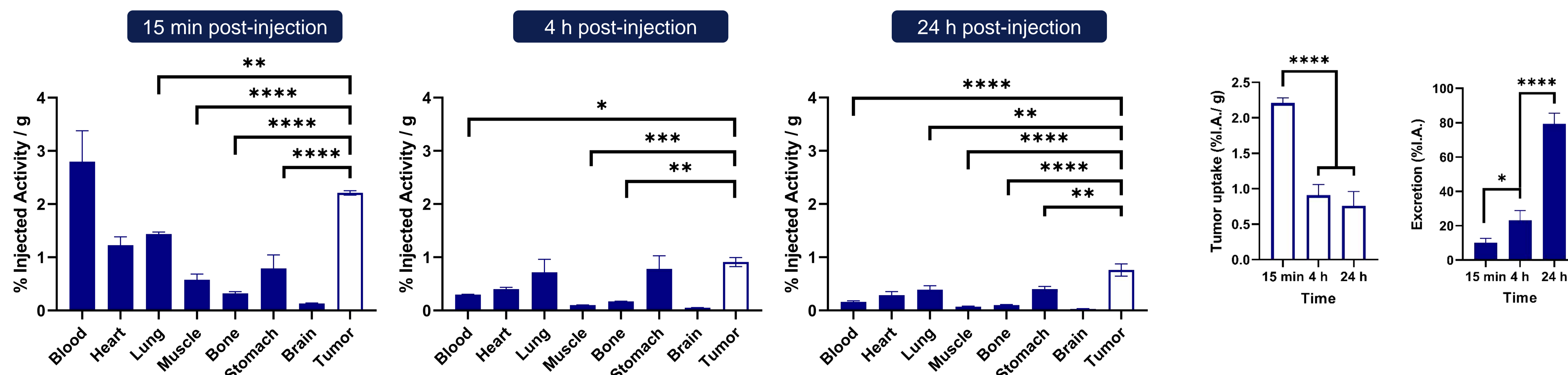
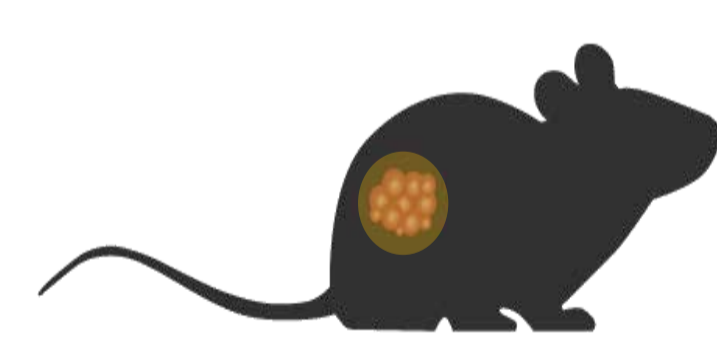


### Cellular Internalization



Results (N = 4) were normalized by protein content

### Biodistribution studies of [<sup>99m</sup>Tc]TcPz-LHis in Balb/c-Nude mice bearing A549 Lung Cancer xenografts (N = 3)



### Conclusions

- Cellular uptake of the radiocomplexes depends on the amino acid moiety. The histidine-bearing complexes present the highest uptake in all cancer cell lines, with ~25% of the total cell-related activity found intracellularly.
- A549 cancer cell line shows the highest overall uptake, with the breast cancer cell line MDA-MB-231 showing the lowest uptake.
- [<sup>99m</sup>Tc]TcPz-LHis shows high and fast tumor uptake in tumor-bearing mice, with good retention in the tumor 24 h after injection (~30% compared with 15 min post-injection).

### References:

- [1] Katsanos et al., *Clin. Nucl. Med.* **2019**, *44*, 864
- [2] Jain et al., *Front. Oncol.* **2023**, *13*, 983023
- [3] Morais et al., *Dalton Trans.* **2017**, *46*, 14537

