

## Synthesis and Evaluation of Benzothiazole Derivatives as a Potential Theranostics Radiopharmaceuticals

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To develop metallic radioisotope complex's platform for theranostics, we introduced the complexes of DOTA-benzothiazole (BTA) derivatives labeling with radioisotope for diagnosis (<sup>68</sup>Ga/<sup>64</sup>Cu) and therapy (<sup>177</sup>Lu). The tumor targeting ability of complexes was demonstrated in cellular uptake experiment, <sup>177</sup>Lu-DOTA-BTA exhibited especially higher uptake compare with <sup>177</sup>Lu-DOTA in HeLa cells. <sup>68</sup>Ga-DOTA-BTA and <sup>64</sup>Cu-DOTA-BTA clearly visualized high accumulation in tumor *in vivo* PET imaging. The therapeutic effect of <sup>177</sup>Lu-DOTA-BTA demonstrated in the therapy experiments. Consequently, these tracers represent a useful approach to theranostic tumor radiopharmaceuticals, and when used alone for diagnosis with <sup>68</sup>Ga-DOTA-BTA or <sup>64</sup>Cu-DOTA-BTA and for therapy with <sup>177</sup>Lu-DOTA-BTA and for combination with each other.

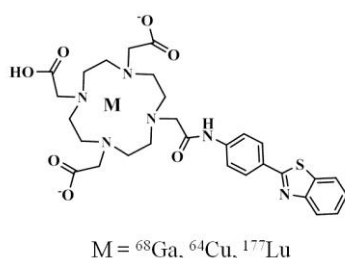


Figure 1. Benzothiazole-based Radiopharmaceuticals

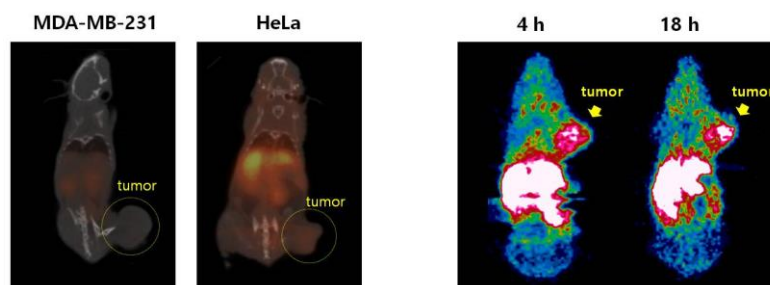


Figure 2. PET images of MDA-MB-231 or HeLa tumor bearing mice obtained with <sup>68</sup>Ga-DOTA-BTA. It exhibited high tumor uptake in the HeLa cell compared with MDA-MB-231 cell.

Figure 3. PET images of HeLa tumor bearing mice obtained with <sup>64</sup>Cu-DOTA-BTA.

### ACKNOWLEDGMENTS

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### REFERENCES

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