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(54) Title: **RADIOPHARMACEUTICAL AND METHODS**

(57) Abstract: The radiopharmaceutical ¹⁷⁷Lu-PSMA I&T including optically enriched mixtures thereof are provided, including in high purities with extended shelf life in the absence of undesired impurities. Further provided are methods of synthesis of ¹⁷⁷Lu-PSMA I&T including optically enriched mixtures thereof under comparatively reduced reaction times and/or temperatures, and pharmaceutical compositions and methods of treatment that comprise ¹⁷⁷Lu-PSMA I&T.



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