

## عنوان مقاله:

Preparation, quality control and biodistribution study of  $^{68}\text{Ga}$ -BPAMD: Optimized production with an in-house  $^{68}\text{Ge}$ - $^{68}\text{Ga}$  generator

## محل انتشار:

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## خلاصه مقاله:

**Introduction:** Bone metastases are common in the progression of various tumors leading to severe pain and decrease in quality of life. The aim of this study was to optimize the production of  $^{68}\text{Ga}$ -BPAMD as an ideal bone imaging agent using an in-house  $^{68}\text{Ge}/^{68}\text{Ga}$  generator for future clinical use. **Methods:** The optimized conditions for the preparation of  $^{68}\text{Ga}$ -BPAMD were determined by varying ligand concentration, pH, time and temperature. The radiochemical purity of the complex was checked using ITLC method. The stability at room temperature and in human serum and the hydroxyapatite (HA) binding of the complex were studied. Biodistribution of  $^{68}\text{Ga}$ -BPAMD and  $^{68}\text{GaCl}_3$  were investigated in male Syrian rats. **Results:** The radiolabelled compound was prepared with a radiochemical purity of > 99% after 15 min at the optimized conditions (30  $\mu\text{g}$  of ligand, 90  $^{\circ}\text{C}$ , pH=3-5). The complex was stable in the final preparation and in the presence of human serum (> 98%). HA binding assay demonstrated that at the amount of 10 and 25 mg of HA, 62.3 and 88.5 % of the complex are bound to HA, respectively. The agent demonstrated significant accumulation in the bone tissue, while cleared very fast from blood circulation. Major difference in uptake between  $^{68}\text{Ga}$ -BPAMD and  $^{68}\text{GaCl}_3$  was observed especially in blood, bone, liver, and spleen which can be considered as favorable characteristics of this agent. **Conclusion:** According to these results, this agent can be produced with the recently developed in-house generator and considered as a worthy bone PET imaging agent available for further clinical use.

## کلمات کلیدی:

Bone metastasis, BPAMD,  $^{68}\text{Ga}$ , PET scan

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