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Production, Quality Control, and Biodistribution Assessment of 111In-BPAMD as a New Bone Imaging Agent

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Abstract : Bone metastases occur in many cases at an early stage of the tumour disease; however, their symptoms are recognized rather late. The aim of this study was the preparation and quality control of 111In-BPAMD for diagnostic purposes. 111In was produced at the Agricultural, Medical, and Industrial Research School (AMIRS) by means of 30 MeV cyclotron via natCd(p,x)111In reaction. Complexion of In-111 with BPAMD was carried out by using acidic solution of 111InCl3 and BPAMD in absolute water. The effect of various parameters such as temperature, ligand concentration, pH, and time on the radiolabeled yield was studied. 111In-BPAMD was prepared successfully with the radiochemical purity of 95% at the optimized condition (100 µg of BPAMD, pH=5, and at 90°C for 1 h) which was measured by ITLC method. The final solution was injected to wild-type mice and biodistribution was determined up to 72 h. SPECT images were acquired after 2 and 24 h post injection. Both the biodistribution studies and SPECT imaging indicated high bone uptake while accumulation in other organs was approximately negligible. The results show that 111In-BPAMD can be used as an excellent tracer for diagnosis of bone metastases by SPECT imaging.

Keywords : biodistribution, BPAMD, 111In, SPECT
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