INTERNAL ORGANS DOSIMETRY OF ^{89}Zr IN MICE UTILIZING BIODISTRIBUTION OF ^{89}Zr-DFO-TRASTUZUMAB, Zr-OXALATE AND Zr-CHLORIDE: PROMISING BIOKINETIC MODEL

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The present investigation focuses on the accumulative activity and absorbed dose of 89Zr in mice to present Human Biokinetic model.

The positron-emitting radionuclide ^{89}Zr ($t_{1/2}$ = 3.17 days) was used to prepare ^{89}Zr-radiolabeled trastuzumab for use radiotracer for characterizing HER2/neu-positive breast tumors. Based on the experimental biodistribution of ^{89}Zr-DFO-Trastuzumab, a new Biokinetic model derative for applying to humans. Based on the experimental biodistribution results taken bioimages at different time points and sacrificed. The bones, the epiphysis and the marrow substance, were separated and evaluated with gamma counts. The transfer decay of the drugs from blood to other organs and organs retentions was simulated, and the input file for the WinAct program was created. The fractional activity computed and the accumulated activity converted to human organs by Sparks and Aydogan formula. Finally, IDAC2.1 program is used to estimate the absorbed dose in each human organ using the residence time. The Fractional Activity of the dose injected to mice with ^{89}Zr-oxalate, ^{89}Zr-chloride, ^{89}Zr- and desferrioxamine is presented. A special focus is also given regarding the quality of ^{89}Zr bone accumulation. The main absorbed fraction by tumor followed by Spleen, Liver, Lungs, Heart, Kidneys, Muscle and bone for ^{89}Zr-DFO-trastuzumab. Tumor received at maximum ~0.5 of fraction activity compared to 0.11 as maximum for spleen as the most organ received activity.

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