

## Estimation of Human Absorbed Dose Using Compartmental Model

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**Abstract :** Dosimetry is an indispensable and precious factor in patient treatment planning to minimize the absorbed dose in vital tissues. In this study, compartmental model was used in order to estimate the human absorbed dose of  $^{177}\text{Lu}$ -DOTATOC from the biodistribution data in wild type rats. For this purpose,  $^{177}\text{Lu}$ -DOTATOC was prepared under optimized conditions and its biodistribution was studied in male Syrian rats up to 168 h. Compartmental model was applied to mathematical description of the drug behaviour in tissue at different times. Dosimetric estimation of the complex was performed using radiation absorbed dose assessment resource (RADAR). The biodistribution data showed high accumulation in the adrenal and pancreas as the major expression sites for somatostatin receptor (SSTR). While kidneys as the major route of excretion receive 0.037 mSv/MBq, pancreas and adrenal also obtain 0.039 and 0.028 mSv/MBq. Due to the usage of this method, the points of accumulated activity data were enhanced, and further information of tissues uptake was collected that it will be followed by high (or improved) precision in dosimetric calculations.

**Keywords :** compartmental modeling, human absorbed dose,  $^{177}\text{Lu}$ -DOTATOC, Syrian rats

**Conference Title :** ICARTR 2018 : International Conference on Advancements in Radiation Therapy and Radiology

**Conference Location :** Venice, Italy

**Conference Dates :** June 21-22, 2018