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Erratum
Automated synthesis and dosimetry of 6-deoxy-6-[^{18}F]fluoro-D-fructose (6-[^{18}F]FDF): a radiotracer for imaging of GLUT5 in breast cancer: Am J Nucl Med Mol Imaging. 2014; 4(3): 248-259

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Abstract: 6-Deoxy-6-[^{18}F]fluoro-D-fructose (6-[^{18}F]FDF) is a promising PET radiotracer for imaging GLUT5 in breast cancer. The present work describes GMP synthesis of 6-[^{18}F]FDF in an automated synthesis unit (ASU) and dosimetry calculations to determine radiation doses in humans. GMP synthesis and dosimetry calculations are important prerequisites for first-in-human clinical studies of 6-[^{18}F]FDF. The radiochemical synthesis of 6-[^{18}F]FDF was optimized and adapted to an automated synthesis process using a Tracerlab FX_{FN} ASU (GE Healthcare). Starting from 30 GBq of cyclotron-produced n.c.a. [^{18}F]fluoride, 2.9 ± 0.1 GBq of 6-[^{18}F]FDF could be prepared within 50 min including HPLC purification resulting in an overall decay-corrected radiochemical yield of 14 ± 3% (n = 11). Radiochemical purity exceeded 95%, and the specific activity was greater than 5.1 GBq/μmol. Sprague-Dawley rats were used for biodistribution experiments, and dynamic and static small animal PET experiments. Biodistribution studies served as basis for allometric extrapolation to the standard man anatomic model and normal organ-absorbed dose calculations using OLINDA/EXM software. The calculated human effective dose for 6-[^{18}F]FDF was 0.0089 mSv/MBq. Highest organ doses with a dose equivalent of 0.0315 mSv/MBq in a humans were found in bone. Injection of 370 MBq (10 mCi) of 6-[^{18}F]FDF results in an effective whole body radiation dose of 3.3 mSv in humans, a value comparable to that of other ^{18}F-labeled PET radiopharmaceuticals. The optimized automated synthesis under GMP conditions, the good radiochemical yield and the favorable human radiation dosimetry estimates support application of 6-[^{18}F]FDF in clinical trials for molecular imaging of GLUT5 in breast cancer patients.

Keywords: Positron emission tomography, automated synthesis, dosimetry, 6-[^{18}F]FDF, GLUT5

Corrections: Tina Grant was accidentally left out of the author list, she should be included.

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