Summary

Uptake of FDG (2-fluoro-2-deoxy-D-glucose) as a Tumor Imaging Agent into Erythrocytes and Accumulation of FDG in Tumor Cells

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Fluorine-18-2-fluoro-2-deoxy-D-glucose (^{18}F-FDG) injectable was developed as a tumor imaging agent reflecting glucose metabolism. In membrane transportation studies, the uptake of ^{14}C-FDG into erythrocytes decreased with an increase in glucose concentration, and Cytochalasin B, inhibitor of glucose transporter (GLUT), blocked the uptake about 75%. The results means FDG is transported into tumor cells mainly by GLUT as glucose analogues. ^{18}F-FDG is recognized to be phosphorylated to ^{18}F-FDG-6-phosphate with hexokinase. We found that FDG-6-phosphate was further isomerized to ^{18}F-FDM-6-phosphate by phosphoglucose isomerase (PGI) *in vitro*. About 27% ^{18}F-FDM-6-phosphate was generated at the reaction with 70 U PGI for 90 min. These results show that the ^{18}F-FDG injectable manufactured by the commercial supply system has equivalent properties; membrane transportation characteristic and enzyme affinity, to FDG synthesized at each PET institution.

Key words: ^{18}F-FDG, PET, GLUT, Hexokinase, Metabolism.