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Comparison of [18F]FLT and [18F]FDG in In Vitro Cancer Cell Uptake and Glucose Effect

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Purpose: [18F]FLT is a new radiopharmaceutical for cell proliferation. We compared [18F]FLT and [18F]FDG in in vitro cancer cell uptake and glucose effect. **Methods:**In vitro cancer cell uptake of [18F]FLT was evaluated using SCC7 (mouse squamous cell carcinoma). At 24 hours after seeding 1 x 10^6 cells/well in 6 well culture plates with RPMI 1640 medium, culture media were changed to medium with glucose free or 100 mg/dl of glucose. Then, [18F]FLT 185 kBq (5 uCi) / 50 ul was added to each well. After incubation for 30, 60, 90, 120 minutes, cells were washed twice by PBS, and harvested using 0.25% trypsin-EDTA. After centrifugation and counting at gamma counter, cell uptake was calculated by % activity of cellular uptake to total activity of cells and supernatant. For comparison, same tumor cell uptake experiments were performed with [18F]FDG. **Results:**After incubation with SCC7 cell line for 30, 60, 90, 120 minutes, [18F]FLT showed 1.95±0.07%, 2.17±0.11%, 2.10±0.13% and 2.80±0.01% of mean cell uptake in glucose free media (n=3 in each), respectively. The results of [18F]FLT uptake in glucose 100 mg/dl media were 1.82±0.05%, 1.87±0.07%, 1.97±0.02%, and 2.95±0.03%, respectively. The results of [18F]FDG in glucose free media were 2.50±0.04%, 3.47±0.10%, 5.04±0.14%, and 10.4±50.30%, whereas those in glucose 100 mg/dl media were 1.60±0.03%, 1.79±0.06%, 1.53±0.10%, and 1.83±0.14%, respectively. **Conclusion:**In contrast to [18F]FDG, [18F]FLT uptake in cancer cell was not significantly affected by glucose concentration. In physiologic glucose concentration, [18F]FLT uptake of SCC7 cell line was significantly higher than [18F]FDG uptake after 120 minutes incubation. [18F]FLT PET imaging may not need fasting for preparation before imaging study.

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PET 벡터 발현 single-chain Fv lym-1의 결합능 평가

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목적: 재조합된 scFv lym-1을 대량 생산용 pET 벡터 발현 시스템으로 생산하였다. affinity coulmn으로 정제된 scFv lym-1의 항원인 Raji cell 세포막 표면 결합능을 평가하고자 한다. **방법:**scFv lym-1 유전자를 선별하여 적합한 primer를 사용하여 증폭시킨 뒤E.coli pET-22b(+) vector에 삽입하였다. scFv lym-1을 발현하는 E.coli BL-21 균주로부터 osmotic shock 방법으로 periplasmic으로 부터 scFv lym-1을 분리하였다. HisTaq column을 사용하여 정제된 scFv lym-1에 125I를 표지하였고, 표지된 scFv lym-1을 desalting column으로 정제하였다. 125I-scFv lym-1의 Raji cell에 대한 결합능은 cell binding assay 통해 측정하였다. **결과:**1 mM IPTG의 2YT media에서 배양 결과 mg 수준의 scFv lym-1을 회수할 수 있었다. HisTaq column을 통해 순수한 scFv lym-1이 분리되었고, 125I scFv lym-1의 표지수율은 약 40%이였다. Cell binding assay를 실시한 결과 재조합 scFv lym-1의 Raji cell 세포 표면 항원에 대한 면역반응성은 약 53%로 나타났다. **결론:**대량생산을 위해 plasmid vector에서 pET vector로 재조합 시킨 scFv lym-1의 생산효율이 크게 향상되었다. 이렇게 재조합된 scFv lym-1의 세포결합 실험에서 높은 면역반응성을 보였다. 비특이 반응에서 모항체인 IgG lym-1에 의해 결합이 억제됨을 확인하였다.