Is 5-iodo-2-deoxyuridine 5-monophosphate(IdUMP) better than 5-iodo-2-deoxy uridine(IUdR) for delayed imaging of tumor proliferation?

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I-123, 124, 131 iododeoxyuridine has been used for imaging of tumor proliferation. In the tumor, IUdR should be phosphorylated by thymidine kinase before incorporation into DNA in place of thymidine, but IdUMP can be directly incorporated. and IdUMP has a potential for therapeutic use when is labeled with P-32. In our animal experiment, the tumor to blood ratio did not improved upto 48 hours after injection of I-131 UdR. To investigate the feasibility of using IdUMP for imaging tumor proliferation, we compared uptake of IUdR and IdUMP in the 72 hours cultured C6, 9L glioma cells and T84.66 hybridoma cells at 2, 4, 8, 16 and 24 hours after incubation. Both 2-deoxyuridine and 2-deoxyuridine 5-monophosphate were labeld with I-131 using Iodobead for 90 minutes at 90°C. The labeling yield of IUdR ranged from 63 to 78%, while that of IdUMP was more than 95%. In the RPMI 1640 media containing 10% fetal bovine serum, the radiochromatography with HPLC using C18 column showed that IUdR was stable, but IdUMP degraded gradually. After the incubation with the 72 hours cultured cells, IdUMP showed less uptake in 2, 4 hours, but higher uptake in 8, 16 and 24 hours than IUdR. In the cells both IdUMP and IUdR were mainly remained in the crude nuclei fraction and less than 5% were in the soluble cytosol fraction after ultracentrifugation. In summary, IdUMP did not need purification after radioiodination, and had higher uptake than IUdR in more than 8 hours after incubation.