[18F]L-FMAC

National Cancer Institute

Source

National Cancer Institute. [18F]L-FMAC. NCI Thesaurus. Code C105850.

A radioconjugate composed of 2'-deoxy-2'-18F-fluoro-5-methyl-beta-L-arabinofuranosylcytosine ([18F]L-FMAC), a L-deoxycytidine analog and high-affinity substrate for deoxycytidine kinase (DCK), labeled with fluorine F 18, with potential diagnostic activity during positron emission tomography (PET) imaging. Upon administration, [18F]L-FMAC is preferentially taken up by and accumulated in cells with high DCK levels, including tumor cells with dysregulated nucleoside metabolism. After phosphorylation by DCK, the 18F moiety can be visualized by PET imaging. As many nucleoside analog prodrugs are chemotherapeutic agents that require DCK for their phosphorylation and activation, [18F]L-FMAC can potentially be used as a marker to measure DCK activity and to predict the chemotherapeutic efficacy of DCK-dependent prodrugs. DCK, a rate-limiting enzyme in the deoxyribonucleoside salvage pathway for DNA synthesis, is overexpressed in certain solid tumors, lymphoid and myeloid malignancies and certain immune cells, such as proliferating T-lymphocytes. The L-enantiomer is less susceptible to deamination by cytidine deaminase (CDA) than the D-enantiomer and increases the stability of this radioconjugate.