Fluorine F 18 5-Fluoro-2-deoxycytidine

National Cancer Institute

Source

National Cancer Institute. Fluorine F 18 5-Fluoro-2-deoxycytidine. NCI Thesaurus. Code C111682.

A radioconjugate composed of a fluorinated pyrimidine analog, linked to the radioisotope fluorine F 18 with potential imaging activity using positron emission tomography/computed tomography (PET/CT). Upon administration of fluorine F 18 5-fluoro-2-deoxycytidine ([F-18]-FdCyd), the FdCyd moiety is phosphorylated by deoxycytidine kinase to 5-fluoro-2'-deoxycytidylate (FdCMP) and deaminated by deoxycytidylate (dCMP) deaminase, an enzyme overexpressed by tumor cells, to 5-fluoro-2-deoxyuridine monophosphate (FdUMP). Eventually, FdUMP is metabolized to the triphosphate forms 5-fluoro-2'-deoxycytidine-triphosphate (FdCTP) and fluorodeoxyuridine triphosphate (FdUTP). FdCTP and FdUTP inhibit DNA methyltransferase (DNMT) and DNA methylation, and induce DNA strand breaks, respectively. FdCyd is coadministered with tetrahydrouridine (THU), an inhibitor of cytidine/deoxycytidine deaminase, which prevents FdCyd breakdown and increases its efficacy. The fluorine F 18 moiety can be imaged upon PET/CT, thereby allowing for the evaluation of the biodistribution of FdCyd and its uptake by tumor cells.