INTERACTION BETWEEN PAMAM G4 DENDRIMER AND 5-FLUOROURACIL IN AQUEOUS SOLUTION

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Poly(amidoamine) dendrimers (PAMAM) are polymeric macromolecules that can find their use as carriers oncologic drugs, including among others 5-fluorouracil.

The aim of our study was to evaluate the number of 5-fluorouracil molecules, an oncologic drug, combined by PAMAM G4 macromolecule and the equilibrium constant of the 5-FU combination with the active sites of this dendrimer in aqueous solution.

The formation equilibrium of PAMAM G4 dendrimer complex with an oncologic drug such as 5-fluorouracil (FU) in water at room temperature was examined. Using the results of the drug solubility in dendrimer solutions and the method of equilibrium dialysis, the maximal number of drug molecules in the dendrimer-drug complex and its equilibrium constant were evaluated. Solubility results show that PAMAM G4 dendrimer can transfer tens 5-fluorouracil molecules in aqueous solution. The number of active sites in a dendrimer macromolecule being capable of combining the drug, determined by the separation method, amounts to $n = 30 \pm 4$. The value of the equilibrium constant of bonding the drug with the active site ($K = 400 \pm 120$) indicates a reversible character of the bonding between 5-FU and the active sites of dendrimer.