# INTERACTION OF G3.5 PAMAM DENDRIMERS WITH CADMIUM IONS

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**Dendrimers are highly branched polymers, which possess a three dimensional structure and many interesting properties. At first they were used in chemistry but today dendrimers are being intensively studied in biology. There have been attempts to use these polymers: as drug or DNA carriers, imaging factors and also as chelators for heavy metal ions. Cadmium ions have a strong toxic effect on all living organisms (including plants) and thereby they pose a serious danger to the environment. There are reports that lower half generations of dendrimers are not very toxic and they could be used as chelators for heavy metal ions, including cadmium ions. Therefore we investigated the interaction between G3.5 PAMAM dendrimers and cadmium ions. The aim of our study was to estimate the number of binding centres per one molecule of G3.5 PAMAM dendrimer. We used: dendrimers (40 μM) and water solution of $Cd(NO_3)_2 \times 4H_2O$ at different concentrations (10–1000 μM). Equilibrium dialysis (24 h) with special MicroEqulibrium Dialyzer was used to bind the cadmium ions to dendrimer and Atomic Absorption Spectrometry (SpectrAA-300) to estimate the concentration of cadmium ions bound to dendrimer. Isothermal titration calorimetry analysis (VP-ITC instrument) was used to show what kind of processes occur during a reaction between G3.5 PAMAM dendrimers. The number of binding centers (n) and the binding constant ($K_b$) was determinated by Scathard-Klotz analysis. The results of investigation show that binding constant $K_b = 1.4 \times 10^3$ M and 36 cadmium ions could be bound with one molecule of dendrimer. It indicates that G3.5 PAMAM dendrimers could be very effective chelators for cadmium ions.**