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Diploma thesis

INFLUENCE OF GLYCOSYLATION, SYNERGISTIC ANION AND pH ON IRON BINDING TO HUMAN SERUM TRANSFERRIN

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SUMMARY

As part of this thesis, it was investigated how does the change in glycosylation pattern, synergistic anion and pH of a buffer effect iron binding constant. All experiments were carried out by UV-Vis and fluorescence spectroscopy in MES buffer, with carbonate or oxalate, at pH 7.4 and 25° C. The ReactLab™ EQUILIBRIA program was used to calculate the constants K_1 and K_2 , which describe the formation of monoferric and diferric transferrin. The obtained constants and titration curves indicate that the first iron binds with the highest affinity to sialylated transferrin with carbonate. Also, iron binds with higher affinity to sialylated transferrin with carbonate as a synergistic anion compared to sialylated transferrin with oxalate, and in the presence of oxalate as a synergistic anion, iron binds more strongly to desialylated transferrin. By comparing the equilibrium constants at pH 5.6 and pH 7.4, we conclude that iron is more strongly bound to transferrin at physiological pH. By changing glycosylation, synergistic ion and pH, the binding affinity of iron to transferrin changes and thus the concentration of free, potentially toxic, iron in the blood.

The thesis is deposited in the Central Library of the University of Zagreb Faculty of Pharmacy and Biochemistry.

Thesis includes: 53 pages, 17 figures, 9 tables i 51 references. Original is in Croatian language.
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