

# Book of Abstracts

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## Antioxidant activity of iron-containing humic compounds with antianemic activity

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Keywords: humic substances, iron(III) hydroxocomplexes, iron deficiency anemia, antioxidants

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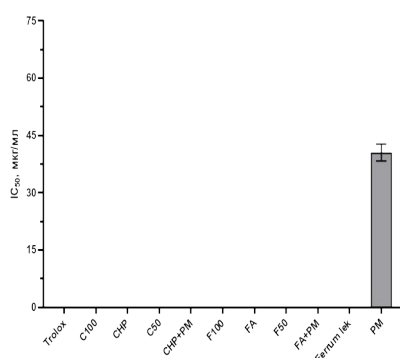
Globally iron deficiency anemia (IDA) affects 2% of the male population and up to 10% of the female population. The main treatment approach for iron deficiency anemia is iron replacement therapy, but there is a risk of oxidative stress development. Thus, the development of new iron containing drugs with antioxidant properties is very relevant. As a new methodological approach in the IDA treatment drugs synthesis a selective addition of the humic substances (HS) fractions carrying functional groups with close acidity was used. The targeted selection of the humic ligands with specific acid, iron-binding, and redox properties capable of both binding ionic iron(III) and stabilizing iron(III) hydroxocomplexes was done.

Experimental samples of iron-containing humic compounds were synthesized in the Natural Humic Systems Laboratory of the Chemical Faculty of Lomonosov MSU, there were 10 samples: CHP – original HS sample (the coal humic acids "Powhumus"), C100 (Fe(III) hydroxide complex with CHP), CHP+PM (CHP with polymaltose, 1:1), C50 (Fe(III) hydroxide complex with CHP and polymaltose, 1:1), FA - original HS sample (the peat fulvic acids "Fulvagra"), F100 (Fe(III) hydroxide complex with FA), FA+PM (FA with polymaltose, 1:1), F50 (Fe(III) hydroxide complex with FA and polymaltose, 1:1), PM - polymaltose and Ferrum Lek® - a reference control.

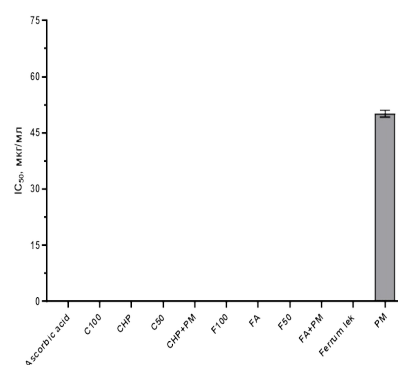
The study of antioxidant properties with used ABTS-test and NST-test (with  $O_2^{\cdot-}$  -in non-enzymatic generation) of the Ferrum Lek®, HS and iron-containing humic compounds was done.

It was shown that an introduction of iron into the humic matrix significantly reduces their antioxidant activity in comparison with the original HS according to ABTS-test and NST-test. The preparation Ferrum Lek® showed lower antioxidant properties in comparison with the experimental samples of iron-containing humic compounds.

a)



b)



Values of IC<sub>50</sub> index for Ferrum lek and the experimental samples of iron-containing humic compounds and positive control preparations (Trolox, Ascorbic acid) in experiments: a) ABTS-test (ABTS<sup>•+</sup>) and b) NST-test (with  $O_2^{\cdot-}$  - in non-enzymatic generation).

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