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Efficient Iron Loading of Ferritin Produced in E. coli

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Ferritin, a globular protein complex essential for iron assimilation and storage within its apoferritin shell, possesses unique biochemical properties and a distinctive topology that make it suitable for diverse applications. This study explores the potential of ferritin as a dietary supplement for iron deficiency and anemia prevention. We conducted cell cultivation experiments to investigate the efficiency of ferritin expression and iron loading both in vitro and in vivo. Using an E. coli strain engineered to produce ferritin, we loaded ferritin with iron directly within the cells. The degree of iron incorporation was assessed using a commercially available kit, revealing that up to 200 iron atoms were successfully loaded per ferritin molecule. These findings demonstrate that ferritin produced in E. coli can be efficiently iron-loaded, making it a promising candidate for use as an iron supplement. Further research into the molecular mechanisms of iron release from ferritin and its bioavailability in humans is necessary to determine the most effective ways to utilize ferritin for improving human health.
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Primary author: VLASOV, Alexey (MIPT, JINR, BIOTECH)

Co-authors: GETTE, Margarita (Moscow Institute of Physics and Technology (MIPT)); TILINOVA, Oksana (Moscow Institute of Physics and Technology); BAZHENOV, Sergey (Moscow Institute of Physics and Technology (MIPT)); RYZHYKAU, Yury (MIPT, JINR); МАНУХОВ, Илья (мфти)

Presenter: VLASOV, Alexey (MIPT, JINR, BIOTECH)

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