Is the iron homeostasis under the control of an iron–sulfur cluster in Fur?

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The Ferric uptake regulator (Fur) controls at the transcription level the expression of almost all genes involved in iron homeostasis and virulence in response to iron concentration. In 2020, Fontenot et al.\(^1\) showed that Fur purified from an *Escherichia coli ΔiscA/ΔsufA* mutant strain binds a [2Fe-2S] cluster to 4 cysteines in a site formerly considered as zinc structural binding site \(^2-6\).

Coupling iron homeostasis and iron-sulfur could make sense and may open new perspectives. This work tries to decipher if iron-sulfur center in *Escherichia coli* Fur is an artefact or a reality. Chemical and enzymatic reconstitution in anaerobic conditions were performed on various oligomeric states of Fur and the resulting samples were tested for their properties using complementary techniques (UV-visible, EPR, SEC-MALLS-RI spectra and ICP-AES analyses) and their DNA binding activity.