

Unique *E. coli* protein may be not after all

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A bacterial protein recently thought to be a unique mechanism for utilizing iron may not be after all. Researchers from the University of Georgia, the Fellowship for Interpretation of Genomes, the University of Oklahoma and the University of Utah School of Medicine report their findings in the latest issue of the online journal *mBio*.

The ability to acquire iron from their host is an important factor in the ability of bacteria to establish an infection. The major source of host iron in infections is heme, a component of [hemoglobin](#) and disease-causing bacteria have evolved complex mechanisms to acquire the heme and extract the iron. In the case of *E. coli* bacteria recent research has reported that the [bacterial protein](#) YfeX is able to remove iron from heme using a process called dechelation and leave an intact tetrapyrrole. This is totally unlike any other described [biological system](#) for iron removal from heme and, thus, would represent a dramatically new feature with potentially [profound implications](#) for understanding how bacteria cause disease.

Based on the [gene sequences](#) responsible for its production, this compound appears to be a dye-decolorizing peroxidase (DyP), a relatively recently recognized superfamily of heme-containing peroxidases that are found in fungi and bacteria.

"Given the diversity of organisms that possess DyP-type proteins, the identification of this class of proteins as heme dechelatasases would have profound physiological and [environmental implications](#). Because of this and our interest in heme metabolism, we undertook to examine in more

detail the protein YfeX," write the researchers.

In the study, they propose and demonstrate that YfeX is a typical DyP with no ability to dechelate iron from heme.

"The data presented herein demonstrate that recombinant YfeX is a typical DyP-type peroxidase and does not possess the catalytic ability to dechelate iron from heme in vitro," write the researchers. "In vivo experiments with YfeX in *E. coli* and its homolog in *Vibrio fischeri* revealed no evidence that YfeX either is involved in iron acquisition from heme or generates prophyrin from exogenously supplied heme."

More information: <http://mbio.asm.org/content/2/6/e00248-11>

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