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## Iron-sulfur cluster proteins as biological switches

Iron-sulfur cluster proteins carry out multiple functions, including as regulators of gene transcription/translation in response to environmental stimuli. In all known cases, the cluster acts as the sensory module, where the inherent reactivity/fragility of iron-sulfur clusters with small/redox active molecules is exploited to effect conformational changes that modulate binding to nucleic acid regulatory sequences. This promotes an often substantial re-programming of the cellular proteome that enables the organism or cell to adapt to, or counteract, its changing circumstances. Here, I will discuss recent progress in the structural and mechanistic characterization of iron-sulfur cluster regulators, focussing on FNR, NsrR, RirA and WhiB-like proteins that are involved in sensing molecular oxygen, iron, and/or nitric oxide in bacteria. In recent years, we have developed the use of mass spectrometry under conditions where iron-sulfur proteins remain folded and the cluster bound; aspects of this work will be discussed.

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