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## Characterizing protein interactions promoting heme regulation of the JMJC domaincontaining protein Gis1 in yeast

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Heme plays versatile and fascinating regulatory roles for fundamental biological processes. Heme serves as a signaling molecule for oxygen levels in yeast as heme function is entwined with molecular oxygen levels. Heme and oxygen regulate the expression of many genes in eukaryotes by modulating activity of regulatory proteins. In yeast, Gis1 is a DNA-binding transcriptional regulator belonging to the JMJD2/KDM4 subfamily of demethylases. It is highly homologous to the mammalian JmjC domain-containing protein JMJD2B, which plays an important role in histone demethylation, oxygen regulation, and hormonal signaling. Notably, recent experiments in our lab showed that heme regulates Gis1 transcriptional and demethylase activities. Biochemical studies indicate that heme binds directly to Gis1 (JmjN+JmjC domain, ZnF) and JMJD2B proteins. This study aims to dissect the molecular interactions promoting heme regulation of Gis1 activity by characterizing Gis1-interacting proteins. Our Affinity Purification Mass Spectrometry (AP-MS) studies indicate that Gis1 interacts with different sets of proteins under conditions of hypoxia, low heme, and high heme. Together, our results show that Gis1 represents a novel class of transcriptional regulators, with multiple interacting partners playing a role in mediating heme signaling.

### Biography

Purna Chaitanya Konduri has completed her BE in Biotechnology from PES Institute of Technology, Bangalore, India in 2008 and MS in Molecular and Cell Biology from UT Dallas in 2014. She is currently pursuing her PhD in Molecular and Cell Biology at UT Dallas in Dr. Li Zhang's Lab. She is working on understanding the mechanism underlying heme regulation of transcription factors in yeast. Specifically, she works on characterizing protein interactions involved in heme regulation of JMJC-domain containing transcription factor Gis1. She has co-authored in a journal article accepted in Nucleic Acids Research and also in a book chapter.

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