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Li Zhang
The University of Texas at Dallas, USA

Heme: A key metabolite impacting diverse physiological and pathological processes

Heme, iron protoporphyrin IX, plays fundamental roles in virtually all living organisms. As a main source of iron for many pathogenic bacteria and fungi, heme impacts their virulence. In mammals, heme is required for the proper functioning of most, if not all, cells and organs. Accumulating evidence increasingly shows that altered heme flux and function contribute to the pathogenesis of many diseases, including common diseases such as cancer and Alzheimer's disease. This broad involvement of heme in human conditions stems in part from its central role in oxygen utilization and metabolism. Further, heme serves as a regulatory and signaling molecule that directly modulates many fundamental molecular and cellular processes by acting on diverse regulatory proteins impacting many physiological and pathological processes, such as tumorigenesis and neural development. I will review how heme modulates the activity of certain representative regulatory proteins, such as transcriptional regulators and histone demethylases. I will also provide recent experimental data implicating the roles of altered heme flux and metabolism in lung tumorigenesis and neuronal dysfunction.

Biography

Li Zhang completed her PhD at University of California, Los Angeles (UCLA) and Post-doctoral studies at MIT Department of Biology. She is the Cecil H and Ida Green Distinguished Chair in Systems Biology Science at University of Texas at Dallas. She has worked on studying heme signaling and function for 20+ years. She has published many original research articles and a book entitled *Heme Biology: The Secret Life of Heme in Regulating Diverse Biological Processes*. Her research work has also made important contributions in understanding the roles of molecular chaperones in cellular signaling, molecular mechanisms of oxygen signaling, and the actions of neurotoxicants. Recently, she focuses on investigating heme function in lung cancer.

li.zhang@utdallas.edu