

## **Abstract**

Heme, a protoporphyrin IX iron complex, is an important component of many proteins necessary for oxygen transfer, storage and activation, as well as for electron transfer. Another group of hemoproteins includes heme sensor proteins. They are either capable of detecting heme itself, which can regulate in turn the sensor function (heme-responsive sensors) or heme forms a binding site for small gas molecules (O<sub>2</sub>, CO and NO) and the heme-based gas sensors are regulated by these diatomic gases. However, in the case of some proteins their classification is not clear showing a properties of both heme sensor proteins families. Their functions are regulated by heme interaction and a further change in their function after binding of a gas molecule to heme was observed. This summary search is focused on specific representatives of heme-responsive sensors (which function is regulated by heme binding), in which the further influence of the CO molecule on their functions have recently been observed. It is discussed whether some heme-responsive sensors are also heme-based CO sensors aiming the most recent findings about the selected specific heme sensors representatives.

**Key words:** heme, heme sensor proteins, heme-based gas sensors, CO sensors, heme-responsive sensors, heme redox sensors