Metalloproteins and cellular detoxification

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Oxygen has a dual role in biology. Oxygen provides a way to obtain cellular energy by respiration coupled to oxidative phosphorilation, but oxygen can also be a source of highly reactive species that can cause cellular damage. Reactive oxygen species (ROS), like superoxide and hydrogen peroxide, can be toxic and must be handled [1, 2].

In anaerobes, iron containing proteins such as non-heme superoxide reductases (SORs) [3, 4] and diheme peroxidases [5] are often used as metabolic devices for cellular detoxification. These proteins reduce ROS in several complex mechanistic steps [6, 7].

Fast kinetics techniques, such as stopped-flow or rapid-freeze quench, were extensively used, in this work, to probe electron transfer rates and to identify relevant intermediate species.

References:

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Acknowledgments: FF wishes to acknowledge to Fundação para a Ciência e Tecnologia (FCT) for the scholarship SFRH/BD/18905/2004.