15. Monitoring of redox-state of respiratory enzymes and myoglobin oxygenation in the working rat heart in normoxia and oxygen deficiency.

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The cellular oxygen supply in the isolated, hemoglobin-free perfused, working rat heart can be determined by measurements of myoglobin oxygenation. However, for a precise analysis of mitochondrial hypoxia and anoxia ($pO2 < 0.01$ Torr) redox-state of respiratory enzymes must be known. By use of the EMPHO (Frank et al. 1989) it is possible to perform a high speed spectrometry within very small tissue volumes. Because of the characteristic absorption spectra of oxygenated and deoxygenated myoglobin and of the oxidized and reduced cytochrome aa3 within the wavelength interval from 500 to 630 nm it is possible to isolate these two pigments from the remission spectra and to determine the oxygenation state of myoglobin and the redox-state of cytochrom aa3.

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