

24. Jahrestagung der Deutschen Gesellschaft für klinische Mikrozirkulation und Hämorheologie in Rostock, Stitzung Aktuelle Tendenzen in der Entwicklung meßtechnischer Verfahren in der Hämorheologie und Mikrozirkulation

Determination of oxygen metabolism in tissues by combined white light spectrometry and laser spectroscopy – an overview about method and study results.

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For the assessment of tissues in surgery, intensive care (ICU) or science, the blood flow in the microcirculation, the tissue pO₂ and other methods like temperature- or PH-measurements have been used. The necessity to assess tissues and organs is obvious in surgery where local perfusion and oxygen situation matters most (e.g. ulcers, transplant, anastomosis). In ICU the regional monitoring is of increasing importance due to regional affect of therapy (e. g. catecholamines, sepsis, organ function).

A new method, called O2C (oxygen to see) combines white light spectrometry and laser spectroscopy to enabling non-invasive measures in tissues of various depths of about 100µm to 16cm. The blood flow in the capillaries, the post-capillary oxygen saturation and the amount of haemoglobin in tissue can be detected pre- intra- and post-operatively. White light in the range of 500 to 800 nm is applied at same time as laser-light of the wavelength 830 nm via flexible fibre optical probes.

An overview about study results of the following fields of application are presented.

- The Impact of the Micro-Lightguide O2C for the Quantification of Tissue Ischemia in Diabetic Foot Ulcers, Beckert et.al. *Diabetes Care* 27:2863-2867, 2004
- Palmar Microcirculation After Harvesting of the Radial Arterie in Coronary Revascularization, Knobloch et. al., *Ann Thorax Surgery* 2005, 79,1026-30)
- A remission spectroscopy system for *in vivo* monitoring of hemoglobin oxygen saturation in murine hepatic sinusoids, in early systemic inflammation, Wunder et.al., *Comparative Hepatology* 2005, 4:1 doi:10.1186/1476-5926-4-1