

Proteome analysis for oxidative stress

“Oxidative stress” is defined as a disturbance in the oxidant-antioxidant balance in favor of the former, and is involved in a numerous number of diseases. We identified the structure of oxidatively modified peroxiredoxin (Prx) and DJ-1 under the oxidative stress condition using mass spectrometry. The ratios of the oxidatively modified Prx 2 and Prx 6 to the reduced form in erythrocytes of Alzheimer’s disease (AD) patients were elevated compared to those of the healthy control, respectively. These modified proteins are promising candidate markers for diagnosis of AD.

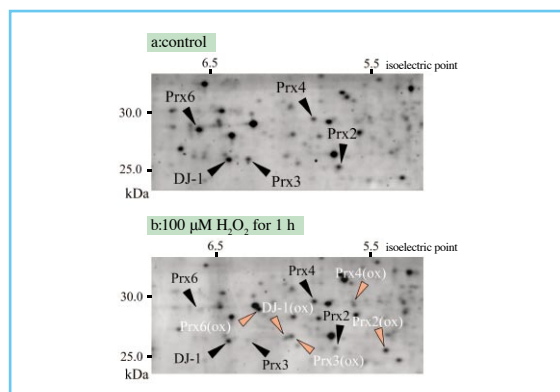


Figure : Two-dimensional gel electrophoresis of endothelial cells (a, normal culture condition; b, cells cultured in medium containing 100 μM H_2O_2 for 1 hour).

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Temperature measurement of microscale specimen by simultaneous measurements of thermoreflectance and electric resistance

A temperature measuring system based on the thermoreflectance method has been developed. This system can measure the temperature of sub-microscale specimen with non-contact, high temperature resolution, high speed, and high spatial resolution. Simultaneous measurements of a specimen in the relative intensity of reflected light and in the electric resistance allow us to determine its surface temperature. High spatial resolution of $0.7\mu\text{m}$ is achieved by employing laser irradiation and detection through confocal microscope optics. The minimum detectable temperature change of 0.2°C at around 100°C is obtained for a molybdenum thin strip.

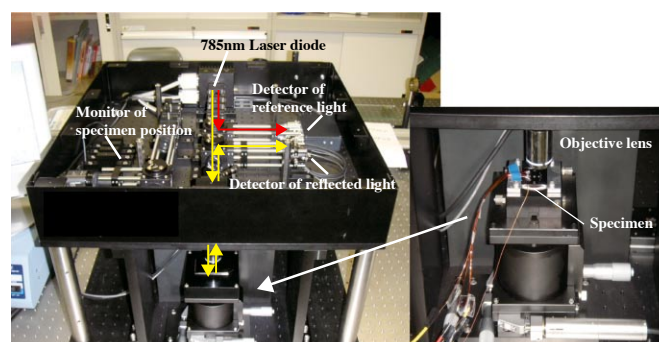


Figure : Thermoreflectance thermometer using a confocal microscope system.

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