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Spectroscopic Studies of High Pressure Effects on Single Erythrocytes SILKI ARORA, SANG HOON PARK, Department of Physics and College of Optics and Photonics, University of Central Florida, LAWRENCE AYONG, DEBOPAM CHAKRABARTI, Burnett School of Biomedical Sciences, University of Central Florida, ALFONS SCHULTE, Department of Physics and College of Optics and Photonics, University of Central Florida — Pressure is an important thermodynamic variable that affects the metabolism of living cells and the rate of a biochemical reaction. We investigate morphological and functional changes in single erythrocytes as a function of pressure. Optical absorption spectroscopy is used to measure the hemoglobin oxygenation in red blood cells. With increasing pressure (0.1 to 200 MPa) the maximum of the Soret absorption band shifts to longer wavelengths by about 0.8 nm (45 cm^{-1}). We attribute this shift to a conformational contribution. However, the small peakshift is indicating that the hemoglobin stays oxygenated. Transient absorption spectroscopy is employed to probe pressure effects on the ligand binding kinetics of hemoglobin. Results will be compared with the kinetics in myoglobin at variable pressure and temperature.

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