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Session G
BIOPHOTONICS

G-1
RAMAN SPECTROSCOPY OF BLOOD PLASMA FOR CANCER DIAGNOSIS

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Raman spectra of blood plasma were studied in the dynamics of the experimental cholangiocarcinoma and glioma. We used a DXR Raman Microscope (Thermo Scientific), excitation wavelengths of 532 nm, range 80–3200 cm^{-1}. Each sample of blood plasma was a droplet with a volume of 10 μL placed on a special aluminum plate. Machine learning methods were used to identify the most informative frequencies associated with cancer molecular markers. The most significant changes in the Raman spectra are observed in the 1200–1700 cm^{-1} range. It was shown that the intensity of the amide 1 band differs in the spectra depending on the stage of development of cholangiocarcinoma or glioma and correlates with the protein concentration in the samples.

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G-2
OXYGEN ACTIVATION IN AERATED SOLVENTS BY LASER RADIATION: MEASUREMENT OF THE ABSORPTION SPECTRA OF DISSOLVED OXYGEN UNDER NATURAL CONDITIONS

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Oxygen activation was studied in aerated organic solvents and water under laser irradiation in the wavelength range 600–1300 nm using chemical trapping and phosphorescence of singlet oxygen. Upon excitation at 740–1300 nm, two major excitation peaks at 765 and 1273 nm were observed, which were close to the absorption bands of monomeric oxygen molecules in rarefied gas. In addition, two 15–100-fold weaker vibrational peaks at 690 nm and 1070 nm were also detected. No