

Statistical approaches for Raman spectra classifications for patients with cardiovascular deceases

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Cardiovascular disease (CVD) is the leading cause of death worldwide and in the Russian Federation. An estimated 17.9 million people died from CVD in 2016, accounting for 31% of all deaths worldwide. 85% of these deaths were due to heart attack and stroke. CVD is the leading cause of death, the most common cause of hospitalizations and disability in the population of the Russian Federation. At the same time, about 40% of people in Russia die at active working age (25-64 years).

This paper describes the results of applying statistical approaches to the processing of arrays of spectral data for different groups of patients: healthy patients, patients with CVD pathologies, healthy patients on therapy, and patients with CVD pathologies on therapy. The applicability of the NIPALS algorithm based on the principal component method for spectrum differentiation is shown.

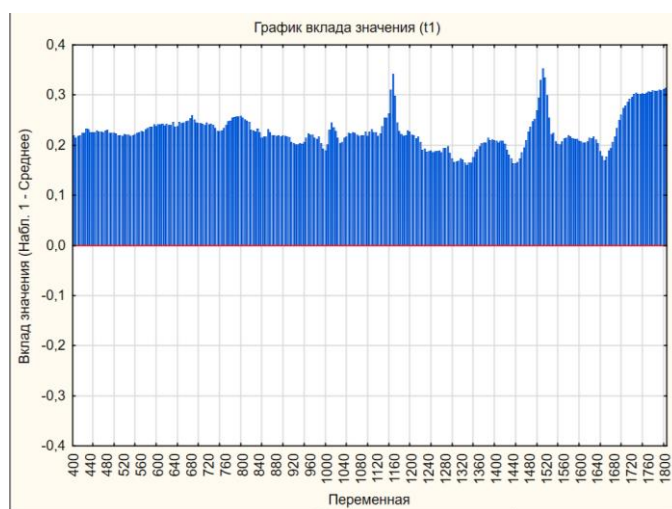


Figure 1. Bandwidth variability plot for a group of healthy patients without therapy.

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In the framework of this paper, the results of applying the approaches of mathematical statistics to the processing of large arrays of spectral data of Raman scattering of light for different groups of patients are described. The applicability of the NIPALS algorithm based on the principal component method for spectrum differentiation is shown.