

The problem of reproducibility of diffraction patterns in laser diffractometry of erythrocytes.

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Laser diffractometry of a blood smear makes it possible to measure the characteristics of the distribution of erythrocytes by size – the average diameter of an erythrocyte on a blood smear, the width and asymmetry of the distribution of erythrocytes by size [1]. The advantages of this method are the simplicity of the experimental setup and the speed of measurements, as well as the necessity for a small amount of blood (several microliters). However, the measurements require a high quality diffraction pattern that occurs when a laser beam is scattered on a blood smear [2]. High spatial resolution and a wide range of light intensity measurements from the diffraction pattern video recording system are required. One of the most important conditions is a high reproducibility of diffraction patterns obtained from the same blood sample. In this paper, we discuss the main factors affecting the reproducibility of diffraction patterns in laser diffractometry of erythrocytes. These factors include the method of preparing a blood sample, the accuracy of the adjustment of the setup, as well as the quality of the materials used to prepare the sample and the camera recording the diffraction pattern. We use a wet blood smear or a highly diluted suspension of red blood cells in experiments. We pour a suspension of erythrocytes in a glass cell measuring approximately 1.5 cm * 1.5 cm * 100 microns so that the cells form a monolayer, and it is possible to observe a single scattering pattern on the screen. At the same time, conditions are also imposed on the orientation of red blood cells in space: the cells must lie perpendicular to the incident laser beam. The present work is devoted to the study of these and other parameters affecting the reproducibility of diffraction patterns.

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2. Лебедева М. С., Цыбров Е. Г., Никандрова А. Е. **Эксперименты по лазерной дифрактометрии мазков крови.** Оптические методы исследования потоков: Труды XVI Международной научно-технической конференции, 28 июня – 02 июля 2021, с. 175-182.