Abstract

Shapes and volume fractions (number and volume) of the red blood cells (RBCs) are important indicators for checking the patient cases. Microcytes, macrocytes, Elliptocytosis, oblate, and prolate are different RBCs shapes related to the blood diseases.

The structure, the volume and the number of RBCs cell have direct effects on the electrical characteristics of RBCs. Many mathematical algorithms had been proposed for estimating the characteristics of nonspherical shapes. Unfortunately, many assumptions had been imposed to overcome the complexities of these algorithms. Besides these algorithms had been simulated the RBCs with spheres shapes only, where they are very complicated to apply for any other shapes. In this paper, the electrical characteristics of the oblate and the prolate RBCs had been estimated as function of the characteristics of the spherical RBCs. These characteristics include the relaxation time, the membrane capacitance of the cell, the low and very high frequencies permittivity and the conductivity.
References


Index Terms

Computer Science

Applied Sciences

Keywords

Volume fraction, permittivity, oblate RBCs, prolate RBCs, membrane capacitance.