

Determination of Hemoglobin in Rats with Septic Shock by Photoacoustic Spectroscopy

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Septic shock is the main cause of death in patients in the area of intensive therapy [1]. Nowadays, few methods exist in the clinical area that provide an early diagnose of this condition, and these methods even deliver imprecise values on the concentration of hemoglobin. Photoacoustic spectroscopy (PAS) has been previously used to determine the amount of hemoglobin present in blood, based on the identification of the α , β , and γ peaks in the optical absorption spectrum, located at approximately 412 nm, 550 nm, and 580 nm, respectively. The intensity peak ratios γ/β and γ/α have been reported to be inversely proportional to the concentration of hemoglobin [2], which is related to the severity of the septic shock. The main goal of this work was to analyze the evolution of the γ/β and γ/α ratios, obtained by PAS, in blood samples from two groups of rats with septic shock induced by a lipopolysaccharide administration (LPS, 6 mg/Kg); one of these groups was treated with Dimethylformamide (DMF). It was found that, during septic shocks, the γ/β and γ/α ratios increase with time implying a decrease of the hemoglobin concentration. In addition, the DMF treatment could reduce the severity of septic shocks.

References:

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