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Biochemical and Biophysical Properties of Red Blood Cells in Disease

Guest Editor:

Dr. Gregory Barshtein
The Faculty of Medicine, The Hebrew University of Jerusalem, Jerusalem, Israel

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Message from the Guest Editor

Red blood cells (RBCs, erythrocytes) are highly specialized cells devoted to the transport of respiratory gases. In blood circulation, RBCs are subjected to blood flow-induced shear stress and oxidative stress. To withstand these conditions, RBCs have unique biochemical and biophysical properties, which define their functionality. In a mature state in a healthy person, these cells live in the circulation for 100 to 120 days. In numerous pathological conditions (e.g., diabetes and cardiovascular) and under aging (in vivo and during storage), the biochemical and biophysical features of RBCs can be drastically altered.

The nature of the membrane of erythrocytes, as well as proteins of the cytoskeleton, their molecular interactions and the lipid composition of this membrane, the content of ions and water, membrane permeability, and the regulation of signaling pathways through specific receptors are different aspects that determine the unique properties of RBCs.

RBC research is very dynamic, experiencing interdisciplinary, multifaceted approaches. This issue will gather articles addressing biochemical, biophysical and physiological aspects of RBCs in different pathological states.

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Contact Us

Biomolecules Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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