



# FEPS 2019 – BOLOGNA

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With participation of the  
Austrian, Croatian, Czech, French, Slovak, Slovenian, Spanish, Swiss and Turkish  
Physiological Societies

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<https://www.feps-sif2019.org>; <https://www.fisiologiaitaliana.org>

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### **Band 3 protein function in oxidative and inflammatory diseases**

**Morabito R<sup>1</sup>, Remigante A<sup>1,2</sup>, Spinelli S<sup>1</sup>, Vitale G<sup>1</sup>, Loddo S<sup>3</sup>, Trichilo V<sup>3</sup>, Dossena S<sup>2</sup>, Marino A<sup>1</sup>**

<sup>1</sup>Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Italy; <sup>2</sup>Institute of Pharmacology and Toxicology, Paracelsus Medical University, Austria; <sup>3</sup>Department of Clinical and Experimental Medicine, AOU Policlinico Universitario G. Martino, Italy

SO<sub>4</sub><sup>=</sup> uptake through Band 3 protein (B3p) represents a tool to monitor erythrocytes function under different conditions, such as diseases associated to oxidative stress, related to metabolic dysfunctions or inflammation. In the present investigation in vitro experiments have been conducted to monitor B3p function in several pathological conditions. Blood samples were withdrawn from patients affected by Systemic Sclerosis (SSc), or with high glycated hemoglobin (HbA1c) levels or elevated serum C-reactive protein (CRP) levels. The rate constant for SO<sub>4</sub><sup>=</sup> uptake, determined by turbidimetric method and accounting for efficiency in anion exchange through B3p, was significantly lower in SSc patients than in healthy controls. Under high HbA1c levels, the rate constant and SO<sub>4</sub><sup>=</sup> content were higher than in control patients. Elevated serum CRP levels induced a significant increase in both anion exchange capability through B3p and in SO<sub>4</sub><sup>=</sup> trapped by the cells with respect to healthy volunteers. Once serum CRP levels were brought back to control values, anion exchange capability was restored. Overall, these results indicate that: measurement of the rate constant for SO<sub>4</sub><sup>=</sup> uptake is a suitable tool to monitor the effect of acute inflammation and oxidative stress on erythrocytes homeostasis; high CRP and HbA1c levels seem to accelerate anion exchange capability through B3p; B3p from SSc patients is significantly altered; inflammation remission seems to correspond to B3p function restoration. Future studies will evaluate whether this modification may depend on an altered B3p conformation in crosslink with Hb, or on cellular signaling reflecting on B3p function, in an attempt of better understanding the impact of inflammation and oxidative processes on erythrocytes homeostasis.

PP.304

### **Role of antioxidants in preventing H<sub>2</sub>O<sub>2</sub>-induced damage on Band 3 protein**

**Spinelli S<sup>1</sup>, Vitale G<sup>1</sup>, Remigante A<sup>1</sup>, Morabito R<sup>1</sup>, Marino A<sup>1</sup>**

<sup>1</sup>Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Italy

Hydrogen peroxide has been already proven to elicit oxidative damage on Band 3 protein (B3p), anion exchanger essential to erythrocytes homeostasis. B3p capability in mediating anion exchange can be measured by determining the rate constant for SO<sub>4</sub><sup>=</sup> uptake. In the present investigation the role of different antioxidants in preventing oxidative damage induced by H<sub>2</sub>O<sub>2</sub> has been evaluated. To this end, blood samples, pre-incubated or not with different antioxidants (melatonin, Mg<sup>2+</sup>) for 1 h, were treated with 300 μM H<sub>2</sub>O<sub>2</sub> for 30 min. The rate constant for SO<sub>4</sub><sup>=</sup> uptake, GSH levels and -SH membrane groups have been determined. Magnesium improves the rate constant for SO<sub>4</sub><sup>=</sup> uptake with a significant GSH and -SH groups levels restoration. Melatonin restored rate constant for SO<sub>4</sub><sup>=</sup> uptake, Band 3 protein expression levels and cell shape alterations provided that concentrations not producing malondialdehyde (MDA, index of lipid peroxidation) are used. Our results confirm that: i) anion exchange capability measurement through B3p is a suitable model to prove the beneficial effect of antioxidant against oxidative stress; ii) H<sub>2</sub>O<sub>2</sub> at not hemolytic concentrations reduces anion exchange capability through B3p; ii) Mg<sup>2+</sup> and melatonin prevent oxidative damage and can be useful in therapy against oxidative stress-related pathologies. Further studies are recommended to better focus on pathways associated to this beneficial effect.

PP.305

### **Complete blood count in neonates**

**Satti S**

Department of physiology, Al-Neelain University, Khartoum, Sudan

Complete blood count (CBC) with differential is one of the most common laboratory tests performed today. This test is helpful in diagnosing anemia, infections, acute hemorrhagic states, allergies, and immunodeficiencies as well as conditions secondarily affecting blood and bone marrow such as renal failure and certain cancers. It helps in monitoring for side effects of certain drug and toxic substances exposure that cause blood dyscrasias, at birth, full term newborns (FTN) have significantly different CBC compared to older children and adults. There is relative polycythemia with macrocytosis (high MCV). CBC in neonates also showed marked polychromasia with nucleated RBCs, and a high WBC count. Platelet count in neonates is similar to the adult platelet count. The study objective was to compare hematological parameters in newborns (FTN) outcome of normal vaginal delivery (NVD) and cesarean section (C/S). We recruited 46 neonates (52%) born by NVD and 44 neonates (48%) CBC were estimated in blood samples