

# Effect of Some Flavonic Compounds and Ascorbic Acid on Lactoferrin Stimulation of Erythrocyte Glycolysis and Na<sup>+</sup>/K<sup>+</sup>-ATPase Activity

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The aim of the present study was to assess if some flavonic compounds (quercetin, piceatannol and apigenin) and ascorbic acid could interfere with the Lf stimulatory effect on the erythrocyte function. Quercetin (1.5  $\mu\text{M}$ ) and piceatannol (30  $\mu\text{M}$ ) showed an additive effect on Lf stimulation of Na<sup>+</sup>/K<sup>+</sup>-ATPase when used together with Lf. The enhancement of Lf stimulation on Na<sup>+</sup>/K<sup>+</sup>-ATPase in the presence of flavonoids was probably due to their antioxidative properties and/or to their involvement in the erythrocyte signaling. None of the estimated flavonoids showed an effect on Lf stimulation of the lactate production. Quercetin itself enhanced the ATPase activity but did not affect the lactate formation. Apigenin (1.5  $\mu\text{M}$ ) enhanced reliably the lactate generation, but it did not exert any effect on the ATPase activity. High concentration of ascorbic acid (60 mM) did not change the Lf stimulatory effect on Na<sup>+</sup>/K<sup>+</sup>-ATPase, but decreased the Lf-specific-binding. A significantly strong inhibitory effect on the Lf-specific binding exerted the electron acceptors NAD<sup>+</sup> (2 mM) and FAD (2 mM). These effects concern most likely the competition with Lf for electron(s) which is (are) provided from the erythrocyte intercellular electron transport chain(s).

*Key words:* Lactoferrin, Erythrocyte Glycolysis, Na<sup>+</sup>/K<sup>+</sup>-ATPase