An in situ study of bioenergetic propertis of BHK21/C13 cells treated with Karnozin EXTRA® and NOW L-Carnosine®

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BHK21/C13 cell line are healthy fibroblasts derived from baby hamster kidneys of five unsexed, 1-day-old hamsters, which produce ATP predominantly by oxidative phosphorylation. Little is known about the effect of carnosine on their metabolic profile.

Herein, in the presence of aqueous solution of the capsules Karnozin EXTRA® and NOW L-Carnosine®, corresponding to the concentractions of l-carnosine from the capsules of 2, 5 and 10mM, cells were incubated for 24h. Afterwards, we analysed basal respiration of intact cells, the maximal capacity of the mitochondrial electron transport system and the activity of respiratory chain complexes I, II and IV of treated cells. Mitochondrial respiration is measured using polarography with a Clark-type electrode (Oxygraph system, UK) at 37°C.

The results demostrate that the presence of 2 and 5mM aforementioned capsules leads to an increase in the value of all analyzed parameters compared to control ($p< 0.001$). The mean value of basal respiration, maximal capacity of the mitochondrial electron transport system and the activities of complexes I, II and IV in Karnozin EXTRA® treated cells are higher in comperison with control and the groups treated with NOW L-Carnosine® ($p< 0.001$). In contrast, in the presence of 10mM aqueous solution of tested capsules there was a decrease in the value of all parameters, comparing to control ($p< 0.001$).

We conclude that Karnozin EXTRA® led to a significant improvement in BHK21/C13 cells metabolic profile, compared to NOW L-Carnosine®. Carnosine in this formulation may be an endogenous regulator of fibroblast energy metabolism and a clinically safe therapeutic agent.