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SW06.W31–13
Polyamines neurotoxicity at the brain and ways of its correction

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Changes in polyamine levels are associated with aging and CNS diseases. Polyamines are involved in a processes of oxidative stress (OS) induction and development. Result of thise processese is the accumulation in the brain of a product of their oxidation 3-aminopropanal and acrolein, possessing the expressed neurotoxicity.

Natural dipeptide carnosine (-alanyl-L-histidine) is an effective protector against OS.

Both polyamines and their oxidation product acrolein cause the development of the OS in PC-12 cells. For the first time it was established the protective effect of carnosine on cell death and ROS growth which effectiveness was determined by a toxic dose of acrolein and incubation time with its presence, as well as the mode of carnosine administration.

Senescence accelerated mice strain (SAMR1/SAMP1) has shown the polyamine system violation in early ontogeny leading to antioxidant defense system decreased level. In these conditions the reduction of polyamines in the brain tissue is a significant factor for OS development.

SAMP1 mice have high sensitivity to negative effect of acute hypobaric hypoxia, leading to the development of secondary hemic tissue hypoxia. Proton magnetic relaxation study showed that the exposure of SAMP1 mice to hypoxia can cause cerebral edema.

The clinical and biochemical analysis showed a reduction in the PA levels in blood of patients with chronic cerebrovascular diseases. Including carnosine to complex therapy prevents the development of oxidative stress, promotes the normalization of the PA, which is accompanied by improvement in cognitive functions of the brain.

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SW06.W31–14
Polyamines transport by probiotics

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Polyamines, such as putrescine, cadaverine, agmatine, spermine, and spermidine, have been reported in a variety of foods, such as fish, meat, cheese, vegetables, and wines, where they are naturally present [1]. Moreover, they are essential components of all living cells where they exhibit different roles in cellular growth, normal function, proliferation, differentiation of immune cells as well as in regulation of inflammatory reactions. Thus, the regulation of polyamine levels from the diet is important to keep the function of various organs and their body pool is maintained by three sources: endogenous or de novo biosynthesis, intestinal microorganisms and exogenous supply through the diet. On the other hand, it is to note that the cell growth promoting effect may also be negative in relation to cancer development. In fact, it has been demonstrated that an increase in polyamine levels is also associated with enhanced cell proliferation as well as expression of genes affecting tumor invasion and metastasis [2].

Several studies have reported that probiotics and yogurt have anticarcinogenic effects [3] and in particular the use of fermented milk products is associated with reduced risk of breast, colon and pancreatic cancers [4].

Polyamines transport in some bacterial strains has been extensively investigated [5,6] whereas there is a lack of knowledge about their uptake by bacteria commonly used in the fabrication of milk products. For this reason the transport of spermidine and putrescine by *L. acidophilus, L. bulgaricus* and *S. thermophilus* was investigated.

This work was done in collaboration with 'Centrale del latte di Vicenza' (Vicenza) and the Department of Molecular Sciences and Nanosistems, Ca' Foscari University of Venice.

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SW06.W31–15
Antiproliferative activity of novel Pd(II) and Pt(II) polyamine analogue complexes in human breast cancer cell lines

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Breast cancer is one of the most widely spread malignant tumor forms among women. Thus, the goal of many research studies is to develop new promising antiproliferative agents to efficiently treat breast cancer, without acquiring resistance.

The polyamines putrescine, spermidine and spermine are essential for cell proliferation, differentiation and death. The polyamine pathway has been proposed as a promising target for anticancer therapy using either inhibitors of biosynthetic enzymes or polyamine analogues that activate the catabolism. Polyamine depletion induced by the analogues results in growth inhibition and thereafter induction of cell death. These analogues have previously been shown to exhibit antineoplastic activity in several experimental models, including breast cancer and are presently being tested both *in vitro* and *in vivo* [1].

Cisplatin is one of the most used anticancer drugs in the clinic but its high cytotoxicity and acquired resistance leaded to the search of new metal-based antitumor agents displaying higher efficacy, reduced toxicity and lack of cross-resistance. Many Pt(II) and Pd(II) coordination compounds have been recognized to display significant anticancer characteristics by covalently bind to DNA bases yielding intra- and interstrand adducts, blocking DNA replication and transcription and finally leading to cell death [2].