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Anti-influenza Action of Multinutrient Functional Peptide Complex (MFPC) Grinization®

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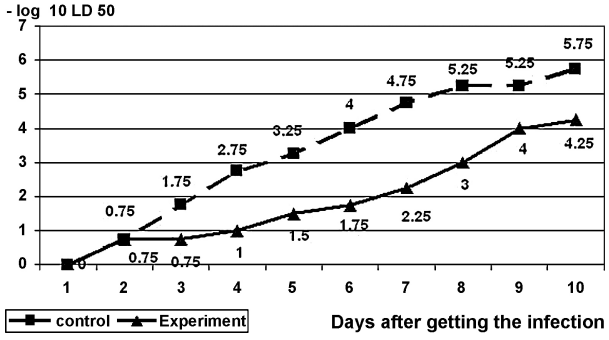
MFPC GRINIZATION® is represented by two forms, the liquid GRIN MIX, and the dry GRIN PRO. It contains natural food factors (nutrients) for special diet food, and is a unique "repair-restorative" complex for practically all systems of organism. Both MFPC compositions are processed by special GRINIZATION technology. It was shown that usage of MFPC GRINIZATION® resulted an immunoenhancement, organism resistance amplify and cell membranes stabilization. Therefore we had studied protective and antiviral actions of MFPC GRINIZATION® on the model of influenza infection in mice. Mice of experimental group received 15 mg/kg of GRIN MIX and 15 mg/kg of GRIN PRO daily during 7 days before infection with influenza virus A/PR/8/34 (H1N1) and 14 days subsequently. The results are demonstrated in figure. Infectious titers of virus in lungs of experimental mice were significantly lower than in control group during observation. Pathomorphological study demonstrated that usage of MFPC GRINIZATION® resulted in considerable reduction of lung injuries, such as reduction of volume and density of inflammatory lesions, number and size of haemorrhages, decreased manifestation of interstitial edema, distelectases, emphysema. More distinct demarcation of the lesions was noticed though the character of inflammatory reaction was preserved. State of myocardium and liver was related to normal whereas myocardium and liver of mice from control group showed diffuse microfocal inflammatory and degenerative changes. The results of this study show anti-influenza action of MFPC GRINIZATION®.



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Antiviral Action of Artificial Ribonucleases against Avian & Human Influenza Viruses

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Background: Ortho-myxoviruses are the cause of the most mass acute infections. They make an enormous harm to the population health and are the cause of significant economic losses. Influenza held the first place as the cause of viral infections' lethality. That's why the elaboration of the methods and means for such infections prevention and treatment is extremely actual task. Artificial ribonucleases (AR) hold promise as reactive groups in conjugates intended for cleavage of particular RNAs, as therapeuticals inactivating virus genome RNAs or certain mRNAs, and as a promising antiviral agents.

Methods: AR are peptidomimetics containing the following amino acids in different combinations: Lys, Glu, Arg, Ser, His and unnatural 6-aminohexanoic acid. The solution synthesis of peptidomimetics was carried out using the method of activated esters and the Boc-strategy. Antiviral activity of 9 AR was studied on the model of influenza viruses strains H_3N_2&H_5N_3 in the tissue culture of 11–14-days chicken embryos' choryoallantoic membranes (CAM).

Results: Anti-influenza activity of AR has presented in table.

Six AR (II, III, IV, V, VI and VII) have antiviral activity toward both researched strains. AR VIII does not display anti-influenza activity. I and IX AR show antiviral activity only against H_5N_3 strain.

Conclusions: The results of the present study are evidence of anti-influenza activity AR. Thus, these substances should regard as candidates for anti-influenza preparations.

Keywords: Antiviral action; Anti-influenza activity

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Table

Code of substance	AR	Anti-influenza activity (in log_{10} TID_{50}) against	
		strain H_3N_2	strain H_5N_3
I	Lys-L1	0,42	2,67
II	Ser-L1	2,75	1,08
III	Glu-AHA-Ser-L1	3,91	3,42
IV	Arg-L1	4,34	3,75
V	Lys-AHA-Ser-1	3,83	2,92
VI	Lys-L2	2,84	4,0
VII	Glu-L2	2,25	1,67
VIII	His-L1	0,16	0,58
IX	His-L2	0,08	2,75

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Efficient Suppression of Human Immunodeficiency Virus in Macrophages by Nano-NRTIs

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Macrophages serve as natural HIV-1 reservoir in the central nervous system. To efficiently target macrophages, we developed Nano-NRTIs, nanoformulations of 5′-triphosphates of nucleoside reverse transcriptase inhibitors, zidovudine (AZTTP), didanosine (ddITP), or their 5′,5′-tetraphosphate dimer. Cationic nanogels consisting of PEG- or Poloxamer-PEI biodegradable networks, star PEG-PEI or PAMAM-PEI-PEG dendritic networks were synthesized and fractionated to isolate nanocarriers with hydrodynamic diameters below 220 nm. Brain-targeted nanogels were obtained by decoration with PEG-linked peptides binding an apolipoprotein E receptor highly expressed in the blood–brain barrier. Nano-NRTIs were obtained by mixing aqueous solutions of AZTTP, ddITP, or dimer with nanogels and freeze-drying. Human monocyte-derived macrophages (MDM) were used for evaluation of intracellular