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# Differential effect of iodine bioorganic molecular complex in balb/c and c57bl/6 mice

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**Abstract:**
Long experience in the use of various iodine preparations has shown that while possessing pronounced antibacterial and antiviral properties, wide-spectrum antimicrobial activity, and lacking mutagenic and teratogenic effects, they are toxic when introduced to the human body, which significantly narrows the scope of their clinical application. The search for alternative ways to solve the problem of high toxicity of inorganic iodine compounds has led to the development of iodine-containing organic complexes. Iodine is characterized by a high bioactivity and exerts wide antimicrobial spectrum with no recorder evidences of resistance development to iodine in bacteria and viruses. The new anti-infectious drug (FS-1) containing molecular iodine has been recently created.

They are active ingredients of mixtures that in binary compound solutions accommodate molecular iodine, bio-organic ligands, and atomic number 19 and metallic element halogenides. In this medication molecular iodine is in such a vigorous kind that once oral administration it minimizes cyanogenetic effects in humans. Antecedently it absolutely was shown that the active advanced (AC) of the medication contains molecular iodine that's settled within within of dextrin and is coordinated by metallic element halides and polypeptides (LiI5-α-dextrin polypeptide). In these kinds of complexes the electronic structure of the I2 molecule is completely different from the electronic structure of I2 in complexes with organic ligands, or in its free state. Apparently, within the AC the molecular iodine exhibits acceptor properties with relevancy polypeptides, and donor properties with relevancy metallic element salt. amongs make sure the presence within the studied mixtures of the 3 active centers settled among the α-dextrin helix: molecular iodine coordinated metallic element halogenides and polypeptides, triiodide, and metallic element halogenides. Mistreatment UV spectrometry, the interaction of α-dextrin-LiCl(I)-I2-polypeptid with the title ester triplet was investigated. Comparison of the quantum chemical calculations allotted for electronic transitions obtained for the structure that models the interaction of α-dextrin-LiCl(I)-I2-polypeptid with the ester triplet indicates that the deoxyribonucleic acid nucleotides will displace peptide and kind stable complexes with molecular iodine and metallic element halogenides. In such structures, molecular iodine binds each the ester triplet and metallic element halogenides. We've got shown that the presence of molecular iodine is significant for activity of compounds that inhibit the situation of HIV-1 integrase. Iodine prevents the situation of integrase from the formation of with HIV deoxyribonucleic acid and inhibits the active complex of integrase and microorganism deoxyribonucleic acid, changing into the middle of another protein advanced, and binding along the situation of integrase and microorganism deoxyribonucleic acid.

The manifestation of the phagocytic response is a significant indicator of the body reactivity state and level of its immune activity. The coordination compound of iodine with alpha-dextrin and polypeptides was synthesized at the Scientific Center for Anti-Infectious Drugs JSC, the effect of which on the phagocytic activity of granulocytes and monocytes in BALB/c and C57BL/6 mice was studied. Phagocytosis is considered as one of the major host defense function, which is a fundamental component of the innate immune response.

Host defense to animate thing infections caused by pathogens like mycobacteria, salmonella, and flagellated protozoan involves each innate and accommodative cell - mediated immune response. it's believed that the resistance provides the initial resistance within the 1st 2 to 3 weeks once infection before the accommodative sort one cell-mediated immunity totally develops. The key cellular parts concerned in resistance embrace neutrophils, macrophages, and NK cells, whereas lymphocytes and macrophages ar the key effector cells in cell-mediated immunity against animate thing infection. Innate immune parts function a linker to cell-mediated immunity partially by cathartic soluble signals like lymphokine twelve (IL-12). Cell-mediated immunity plays a necessary role in conferring the last word protection against animate thing infection (2, 16, 18). Compelling proof by America et al indicates that sort one cytokines, together with IL-12, gamma antiviral agent (IFN-γ), and tumour death issue alpha (TNF-α) play a important role within the development of sort one cell immunity against animate thing infections.

**Materials and methods:**

The animals of every line were divided into three teams of ten mice, together with five females and five males. 2 doses of the drug were utilized in the study: 1/20 of most tolerated dose (MTD) is a hundred twenty five mg/kg and 250 mg/kg (1/10 MTD) of animal weight. Blood was collected on day fourteen once the administration of the drug. The analysis was performed by flow cytometry.

Flow cytometry (FCM) is associate instrumental tool for speedy detection and characterization of microbic cells supported their lightweight scatter and visible light properties. FCM permits analysis of advanced populations in keeping with user-defined cell characteristics, with typical analysis rates approaching ten 000 cells s−1. data regarding cell range, size, molecule content, and genetic identity are often determined through use of varied

labels, stains, and probes. though FCM was developed originally for analysis of comparatively giant class cells, it's finding inflated use by microbiologists, together with food microbiologists. The recent advent of smaller, more cost-effective nevertheless versatile FCM instruments is anticipated to facilitate even larger use of FCM in food biology in applications, together with observance of food fermentations, physiological characterization of microbes exposed to numerous food processing-related stressors, and speedy detection of pathogens in foods.

**Results:**

It was shown that a replacement advanced of iodine with bioorganic molecules upon recurrent oral administration for fourteen days within the examined doses didn't have an effect on the activity in BALB/c mice. The findings indicated that a replacement advanced of iodine with bioorganic molecules at a dose of 250 mg/kg inflated the somatic cell activity of each granulocytes and monocytes in C57BL/6 mice.

**Conclusion:**

One of the explanations for the differential effect of a new complex of iodine with bioorganic molecules on different lines of mice may be based on the genetic characteristics of these animals. Macrophages of BALB/c mice are known to be of M-2 type, which inhibits inducible NO synthesis and stimulates cell division. Macrophages of C57BL/6 mice are of M-1 type, which produces NO and inhibit cell division, and increases the cytostatic or cytotoxic activity of phagocytes. We can therefore conclude that a new complex of iodine with bioorganic molecules enhances the cellular factors of the natural resistance in the prototype mouse strains Th1 (C57BL/6), but not Th2 (BALB/c). This, in turn, fits into the single mechanism of action of the studied complex, namely, the activation of phagocytic cells through the induction of IFN-γ production and the ability of the complex to switch T cells to the Th1-type response path.