DOI: 10.34854/ICPAF.52.2025.1.1.179

ANTIVIRAL ACTIVITY OF SOLUTIONS TREATED WITH LOW-TEMPERATURE PLASMA *)

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The use of low-temperature plasma (LTP) for the treatment of biological objects and tools for interaction with them has attracted particular attention in recent years [1,2]. LTP is capable of effectively destroying a wide range of pathogens, including bacteria, viruses, and fungi, by destroying their cell membranes and nucleic acids.

Plasma-treated water (PTW) and solutions (PTS) are a common alternative to direct plasma exposure. The use of PTS allows both scaling the treatment volume and reaching hard-to-reach areas of biological objects, such as when treating tumors in animals.

The use of PTS as an antiviral drug is widely presented in the scientific literature, but is usually limited to *in vitro* studies and prophylactic effects. The therapeutic effect of both direct treatment with LTP and indirect treatment, i.e. with PTS, remains poorly understood.

In this work, we investigated the *in vivo* antiviral activity of Hanks solutions treated with LTP. The “CAPKO” device [3,4] developed at the GPI RAS was used as a plasma source. Hanks' solution was processed in two modes: the spark discharge generation mode in air, which demonstrated its efficiency in creating PTS with a relatively high concentration of reactive oxygen and nitrogen species, and the plasma jet generation mode with an argon flow, which is a gentler processing method in terms of heating the object's surface, which is important for direct exposure to biological tissues. The first mode of processing was carried out for 10 minutes, and the second mode for 10 and 20 minutes at the same gas flow (2.5 l/min). The concentrations of H_2O_2 and NO_2^- were measured for all PTS samples. The results presented in the report were obtained by treating mice infected with the influenza virus with the preparations intranasally for 3 days. After that, homogenization of the lungs was carried out. The homogenate was then cleared of cellular debris by centrifugation, and the resulting supernatant was used to determine the viral titer and change the amount of viral RNA.

This publication has been supported by the RUDN University Scientific Projects Grant System, project №025323-2-000.

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*) abstracts of this report in Russian