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MEETING ABSTRACTS

NOVICHOK: BASIC KNOWLEDGE OF BIOCHEMICAL PROPERTIES

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In recent years, the most mentioned nerve agents by the public are A–agents, so-called Novichoks. The official chemical structures of these new organophosphates have never been published. The possible structures were introduced by Vil Mirzayanov in 2009 (1), however, they do not correspond with structures published by Hoenig (2).

One type of Novichok was evaluated in our laboratory and its physical-chemical and biological properties were compared to well-known structures of nerve agents such as sarin or VX. Inhibition kinetics of human acetylcholinesterase and butyrylcholinesterase was determined. Further, the ability of standard oxime nerve agent antidotes to reactivate both inhibited cholinesterases was assessed. Cytotoxicity of Novichok compound was evaluated using human origin cell lines, including normal human lung fibroblasts (NHLF) and neuroblastoma cell line (SH-SY5Y), which undergo differentiation to mature neurons.

The research findings are initial dates in our research of fourth-generation nerve agents and should be useful towards the development of effective antidotes and possible subsequent therapy.

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Keywords: antidote; cholinesterases; Novichok; nerve agent; reactivation; cytotoxicity

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