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Effect of DNA-hydrolyzing catalytic IgGs from schizophrenia patients on cell viability of the SH-SY5Y cell line

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Background and Methods

Background: DNA-hydrolyzing catalytic IgGs have cytotoxic effects in autoimmune diseases [Sabirzyanova A.Z., Nevzorova T.A., 2013; Nevinsky G.A., 2017]. Such IgG antibodies are capable to transgress the cell membrane, influence intracellular processes, and activate cell death processes [Rivadeneyra-Espinoza L., Ruiz-Argelles A., 2006]. Recently, DNA-hydrolyzing IgGs have been discovered in schizophrenia [Ermakov E.A., Smirnova L.P., Parkhomenko T.A. et.al., 2015]. However, their cytotoxic properties have not been studied.

The aim of the study was to investigate the effects of IgG isolated from the serum of schizophrenic patients with DNA-hydrolyzing activity on cell viability of the SH-SY5Y human neuroblastoma cell line.

Methods: Serum of 8 patients with paranoid schizophrenia (F 20.00, F 20.01, F20.02) in the acute phase and 7 healthy persons matched by sex and age was used. IgG was purified from serum by affinity chromatography on Protein-G-Sepharose columns. The homogeneity of the preparations was confirmed by the method of gradient electrophoresis in 12.5% PAGE. The DNA hydrolyzing activity of IgG was assessed by the degree of hydrolysis of the pBluescript plasmid. The cell viability of the SH-SY5Y cell line after 24 house exposure to purified IgG preparations was assessed by high-throughput screening on the CellInsight CX7 platform (Thermo Scientific, USA) using the fluorescent dyes propidium iodide and Hoechst (Fig. 1). The final antibody concentration was 0,1 and 0,2 mg / ml. Statistical analysis was performed using the SPSS software, release 20.0,

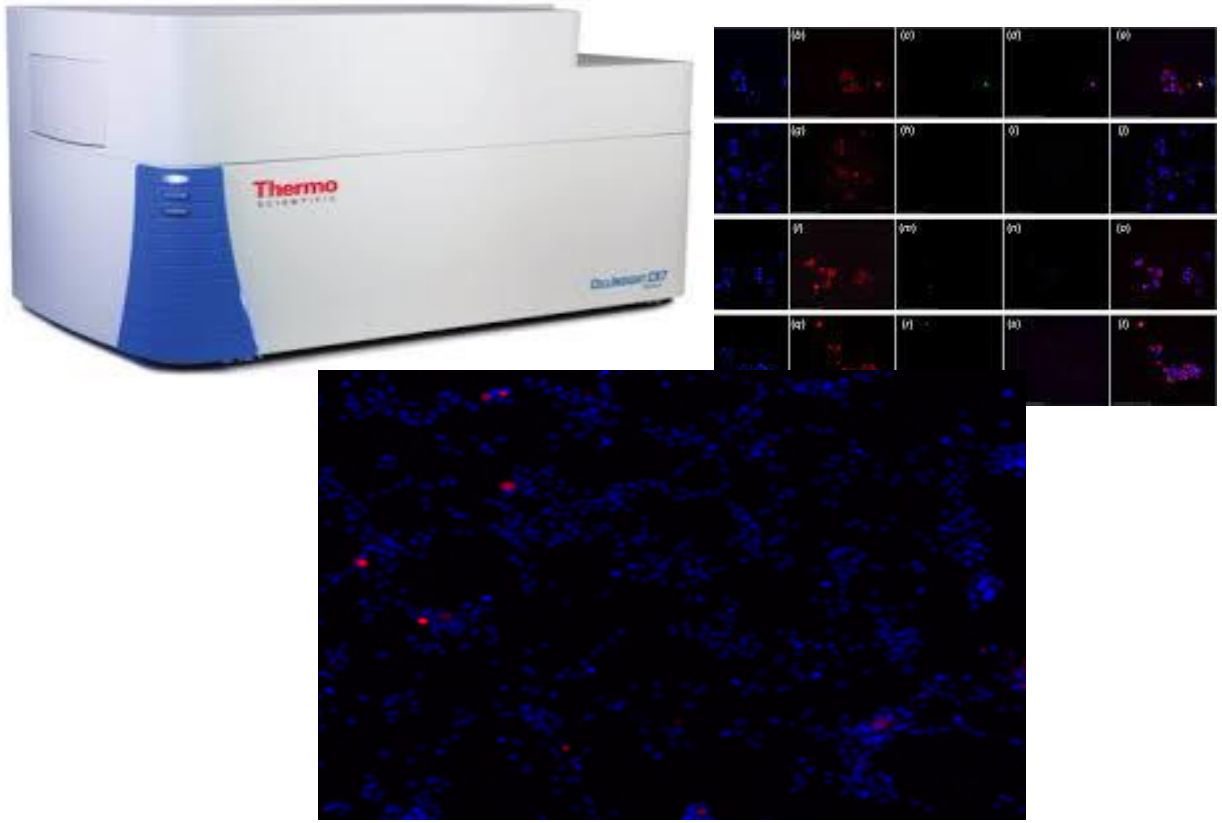

Fig. 1. Registration cells on the CX7 platform: cells stained with Hoechst and Propidium Iodide

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Results and Conclusion:

Results: Of the 8 IgG preparation obtained, 4 drugs had high DNA-hydrolyzing activity. All tested IgG preparations from healthy donors were inactive. One-way ANOVA analysis after exposure to antibodies (0.1 mg/ml) showed no significant differences in the proportion of dead cells SH-SY5Y (p=0.688 after 24 hours) (Fig.2). Similar results were obtained at a higher concentration of antibodies - 0.2 mg / ml (Fig.3).

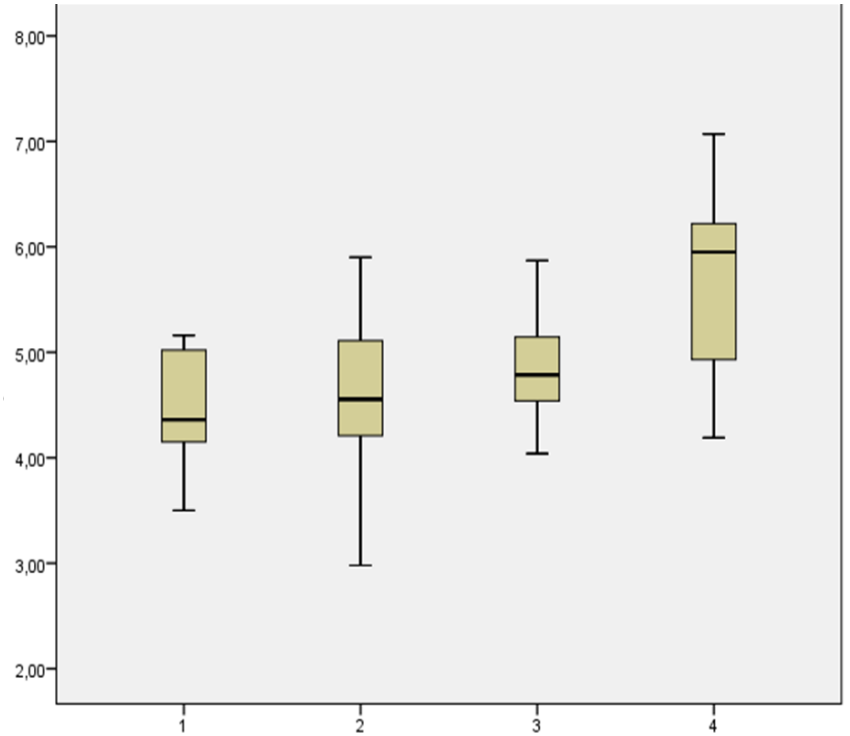

Fig. 2. % dead cells shsy5y after exposure to IgG (0,1 mg/ml)

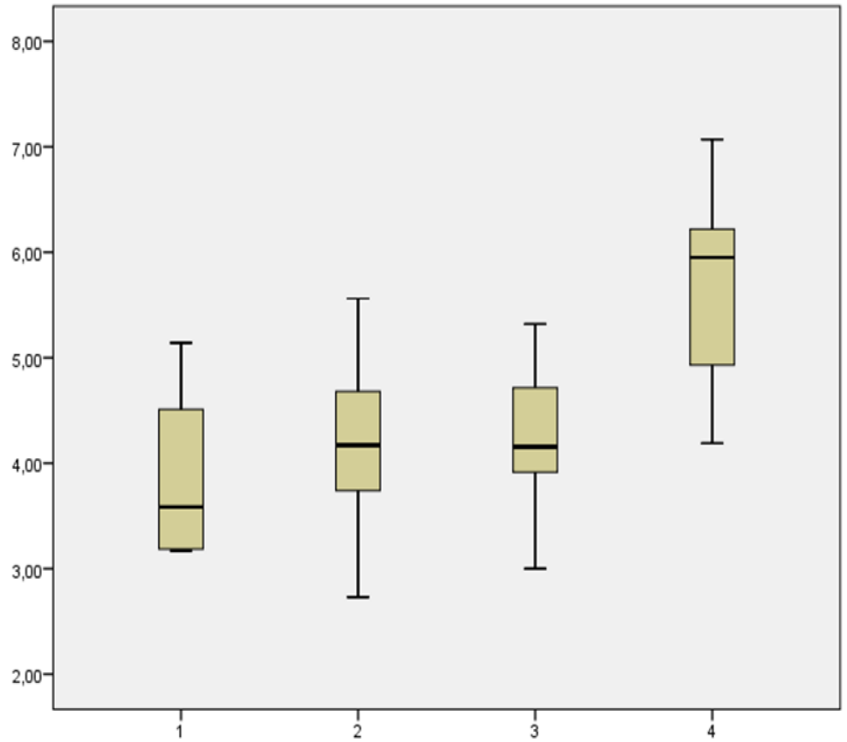

Fig. 3 % dead cells shsy5y after exposure to IgG (0,2 mg/ml)

1 - IgG patients with DNA-hydrolyzing activity
2 - IgG patients without DNA-hydrolyzing activity
3- IgG healthy donorswithout DNA-hydrolyzing activity
4 - Control

Conclusions: Thus, it has been shown *in vitro* that IgGs isolated from the serum of schizophrenia patients with or without DNA-hydrolyzing activity does not exhibit cytotoxic properties against the SH-SY5Y human neuroblastoma cell line.

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Thank you for your attention

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