Tilgase *et al.: Intrinsic Activity*, 2017; **5**(Suppl.2):A2.50
doi:10.25006/IA.5.S2-A2.50
published online: 16 October 2017

2nd International Conference in Pharmacology: From Cellular Processes to Drug Targets

Rīga, Latvia, 19–20 October 2017

MEETING ABSTRACT

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The oncolytic effect of the ECHO-7 virus Rigvir® on cell viability *in vitro*

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Background: The genetically non-modified, non-pathogenic ECHO-7 virus strain Rigvir®, selected and adapted for melanoma or subjected to targeted evolution, is the first approved oncolytic virus. It is a positive-sense single-stranded RNA, non-enveloped, icosahedric virus approximately 25–30 nm in diameter. The host for ECHO viruses is human. A recent retrospective study suggests that substage IB, IIA, IIB, and IIC melanoma patients treated with Rigvir® had a 4.39–6.57-fold lower mortality than those under observation only [1]; there was no untoward side effect or discontinuation of treatment. Safety assessment of adverse events graded according to NCI CTCAE did not show any value above grade 2.

Objectives: The present study was performed to test the effect of Rigvir® on the viability of several human cancer cell lines.

Methods: The effect of Rigvir® (1% or 10%, volume/volume) on the viability of FM-9, RD, AGS, A549, HDFa, HPAF-II, MSC, MCF7, HaCaT, and Sk-Mel-28 cell lines was measured using live cell imaging *in vitro*. PBMC viability was measured using flow cytometry. Cells were observed for 96 h after addition of Rigvir®. The presence of the virus was visualized by specific ECHO-7 antibody staining. Statistical difference between treatment groups was calculated using two-way ANOVA.

Results: Rigvir® (10%) reduced cell viability in FM-9, RD, AGS, A549, HDFa, HPAF-II and MSC cell by 67–100%. HaCaT viability was partly affected while Rigvir® had no effect on MCF7, Sk-Mel-28 and PBMC viability. Detection of ECHO-7 antibody in FM-9, RD, AGS, A549, HDFa, HPAF-II and Sk-Mel-28 cells suggests that the presence of ECHO-7 in the cells preceded or coincided with the time of reduction of cell viability. Rigvir® (10%) had no effect on PBMC cell count. The results suggest that Rigvir® *in vitro* reduces the viability of cells of human melanoma, rhabdomyosarcoma, gastric adenocarcinoma, lung carcinoma, and pancreas adenocarcinoma but not of PBMC. The presence of ECHO-7 in sensitive cells was confirmed using ECHO-7 antibodies.

Conclusions: The results suggest that the basis for the clinical benefit of Rigvir® is due to its oncolytic properties and that the effect of Rigvir® could be clinically tested in other cancers besides melanoma.

Keywords: Echovirus 7 – immunotherapy – melanoma – oncolytic virotherapy – Rigvir®

Reference

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