

Virus Control by Salvatore Mottilo

Biotechnologies

Experiment

Intermediate Age 15

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Project summary

In order to study a virus trap model, various gamma radiation doses were tested on astrocytoma cells subsequently infected with Mouse Hepatitis Virus. The cytopathic effect, as well as a virus count of the samples, was measured to evaluate the efficiency of these “trap cells” in modulating viral infection.

Project report

Introduction: “The single biggest threat to man’s continued dominance on the planet is the virus.”¹

A treatment that may exploit the viral replication mechanism was devised against the Mouse Hepatitis Virus, MHV-A59, which causes multiple sclerosis-like symptoms in mice. It involved the use of gamma radiation to alter astrocyte-like Delayed Brain Tumour (DBT) cells as viral targets. By properly preserving cell membranes using an accurate dose of irradiation, the goal is to fool viruses into attacking cells that will not allow MHV RNA replication to occur, resulting in decreased viral replication.

Problem: Helping to treat viral infection

Hypothesis: Irradiating DBT cells, while ensuring that their surface components are preserved and that their interior machinery and/or DNA is partially ruptured, will be efficient in fooling MHV to bind and fuse with membranes, but will fail at MHV RNA replication. The decrease or inactivity of MHV will result in the death of fewer cells.

¹Nobel laureate Joshua Lederberg