



Boston University
School of Medicine

Department of
Biochemistry

715 Albany Street
Boston, Massachusetts
02118-2526

Vladimir Gabai, PhD
Research Assistant Professor

phone (617) 638-5970
fax (617) 638-5339
gabai@bu.edu

Apr 4th, 2016

To whom it may concern:

Dear Sir/Madam:

It is my pleasure to submit of review of thesis of Evgeny Kozlov "ANALYSIS of GENE EXPRESSION OF CAPSID PROTEINS OF DENSOVIRUS OF GERMAN COCKROACH (BgDV1) IN HETEROLOGOUS SYSTEMS: MAMMALIAN CELL CULTURES AND TRANSGENIC LINES OF DROSOPHILA"

Study of mechanisms of infection, expression of the genetic information of the viral genome, and interaction of viral proteins with host cells provide an opportunity to explore a wide range of fundamental biological problems. One of the approaches to this which was used by E.Kozlov is analysis of viral gene expression in heterologous systems. In particular, the study of the mechanism of antiviral defense of insect cells is of great interest because it opens the possibility to identify new aspects of such anti-virus systems and to study in detail cellular signal transduction upon viral infection. Of note, many receptors and signaling cascades involved in antiviral protection in insects (particularly, in fruit flies *D. melanogaster*) are similar to those of the higher vertebrates. This can allow more detailed study of the evolutionary emergence of antiviral protection in eukaryotic organisms and find out new aspects of its functions.

For the first time E.Kozlov has demonstrated the possibility of using mammalian cell culture to study intracellular transport of the capsid proteins of densovirus of insects. Furthermore, he found the functional significance of nuclear transport signals (NLS and NES) of core proteins of BgDV1 virus predicted by in silico methods. Transgenic *Drosophila* lines containing both native cDNA sequences the genome as well as with mutant sequences of the capsid protein were created. The uniqueness of these lines is that foreign genetic material integrated into their genomes differs just in one nucleotide. It was shown that upon cDNA expression of one capsid protein (VP2) of BgDV1 virus in the tissues of transgenic *Drosophila* is the splicing of the transcript that prevent the formation of native protein

product; such phenomenon may serve as a novel mechanism of antiviral infection.

It was found for the first time that changing the subcellular localization of the capsid protein of German cockroach, expressed in transgenic lines of *D. melanogaster*, greatly affects the pattern of gene activities of the host. In particular, there is a change in activity of genes responsible for innate immune response.

As a whole, the work of E.Kozlov is novel, actual, and well-done study, and the author deserve to be awarded with PhD degree.

Sincerely,

Vladimir Gabai, PhD

