

Mycotoxin T-2 is the most toxic representative of group A trichothecenes, which are secondary metabolites produced by fungi of the *Fusarium* genus which are in nature many kinds of cereal such as wheat, barley, oats and corn. Unlike other toxins of biological origin (botulinum toxin, abrin, ricin), which have a peptide structure and their mechanism of action is well known, chemically the T-2 toxin is a low molecular compound with a ring structure (molecular weight is 466 Da). T-2 toxin has a tetracyclic ring system which has the ability to react with intracellular nucleophilic groups in biomolecules. This unique structure causes that T-2 toxin has properties similar to the 'Chemical weapons' and effective research into its properties require a multifaceted approach. Unlike most biological toxins that do not affect the skin, the T-2 toxin is very irritating to it. The symptoms appear within minutes of exposure. Skin damages caused by T-2 toxin are even 400 times stronger than when using sulfur mustard belonging to the group of irritating chemical warfare agents. Harmful effects on the skin include swelling, intradermal haemorrhage and necrosis.

Due to the lack of accurate data on the mechanisms of its action on the human body, T-2 toxin is a considerable threat to health and life. Hence the main objective of this research project. Its main assumptions include a detailed, multifaceted analysis of molecular cell changes caused by the T-2 toxin in terms of transcriptome, proteome and damages of the mitochondrial and nuclear genome. In addition, the extent of toxin absorption by cells will be determined as a complement to the study. The research planned in the current project will be conducted on previously prepared biological materials - RNA, DNA and purified protein fraction derived human fibroblast cells - Hs68 treated with T-2 toxin in a wide range of concentrations (0.1-1000  $\mu$ M).

This research project will allow for the first time to characterize the molecular mechanisms of toxic properties of the T-2 toxin, which are poorly understood so far, which may help in proper implementation rescue actions during poisoning/contamination by this toxin.