New Jersey State Commission on Cancer Research
LAY ABSTRACT OF RESEARCH PROJECT

NAME OF PRINCIPAL INVESTIGATOR/PROGRAM DIRECTOR: **Andreas Ivessa**

Project Title: **Mechanisms of mitochondrial DNA inheritance**

Description: **Understanding how the integrity of mitochondrial DNA influences genome stability in the nucleus will allow us to design new anti-cancer drugs**

Mitochondria are important cellular organelles that provide cells with energy. Several types of cancers are caused by dysfunctional mitochondria and mutations in mitochondrial DNA. The frequency of mitochondrial DNA mutations in cancer cells can be even tenfold higher than that of mutations in nuclear DNA. The majority of damage in mitochondrial DNA is caused by reactive oxygen radicals. It is therefore important to gain a better understanding of which factors contribute to the maintenance of functional mitochondrial DNA, but also to identify factors that can be targeted in order to prevent damage to mitochondrial DNA. In this study we will gain information about two proteins that are either part of the machinery that duplicates mitochondrial DNA, or are part of a repair system that is activated in response to damage in mitochondrial DNA. The goal of our research is to understand the involvement of two specific proteins in the duplication and repair of mitochondrial DNA, and identify factors that can then be used for the design of drugs that will specifically target cancer cells.