

ELEMENTS OF RADIOBIOLOGY FOR PILOT PIRX

Summary

Contrary to the widespread opinion, interstellar space is not empty but filled with high energy particles that originate from within and from outside of our Solar system. These particles can induce ionization lesions in human cells and present a health hazard for astronauts. DNA is the most sensitive component of the cell and induction of DNA damage by ionizing radiation triggers a cascade of signals which can either push the cell towards committing suicide by apoptosis or initiate repair processes. A number of repair pathways exist but none of them is error-free. Repair mistakes can lead to the forma-

tion of mutations which are potential sources of cancer. The actual doses received by the astronauts in space is a matter of debate. A number of studies have been performed to assess the dose by means of biological dosimetry. This method relies on the analysis of chromosomal aberrations in peripheral blood lymphocytes. Most studies show an increased frequency of aberrations in lymphocytes of astronauts who spent at least several weeks in space. This clearly shows that space travel is associated with a risk of developing cancer.