

AN EVALUATION OF POST-PHOTODYNAMIC THERAPY DNA DAMAGE IN MALIGNANT CELLS USING THE COMET ASSAY

AGNIESZKA CHWIŁKOWSKA¹, JOLANTA SACZKO¹, MAŁGORZATA DRĄG-ZALESIŃSKA², TERESA WYSOCKA², ANNA MARCINKOWSKA¹, ANNA MALARSKA¹ and TERESA BANAS¹

¹Department of Medical Biochemistry, Academy of Medicine, Chałubińskiego 10, 50-368 Wrocław, Poland, ²Department of Histology and Embriology, Academy of Medicine, Chałubińskiego 6a, 50-368 Wrocław, Poland

Photodynamic therapy (PDT) is a cancer treatment involving the incorporation of photosensitizing molecules into malignant tumors and their activation with visible light. As a consequence, singlet oxygen and other reactive oxygen species are generated, causing cell death and tumor ablation following DNA damage. We studied damage on Photofrin II PDT-treated malignant cells using the Comet assay, a test which is considered to be a sensitive means of detecting DNA damage.

The aim of this study was to evaluate the potential DNA-damaging effects of Photofrin II-mediated PDT treatments on PC 12, Jurkat and MCF 7 malignant cells. To study immediate DNA damage, cells were directly treated with the alkaline Comet assay, and to study residual DNA damage, cells were incubated in fresh medium 5 and 12 h after irradiation.

We observed that Photofrin II, both in the absence and presence of laser light ($\lambda=632,8$ nm) at a dose of 5 J/cm^2 , induced significant Tail Moment changes. Damage intensity differed according to the time of incubation with Photofrin II. These results strongly suggest that PDT effects on DNA damages are the cause of morphological changes – apoptosis or necrosis. Therefore, this study might be helpful in increasing the efficacy of PDT.