DEVELOPMENT OF A NOVEL NANOBIOSYSTEM FOR THE SELECTIVE NANOPHOTOTHERMOLYSIS OF LIVER CANCER

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INTRODUCTION

Due to chemoresistance, liver cancer (LC) isthe main cause of millions of deaths each year. Development of new active biomolecules that are highly effective and refractory to chemoresistance may open new anenues in the field of oncology. In this research we have focused on the development of a novel nanobiosystem with high affinity for lier cancer cells to mediate its selective laser thermal ablation.

MATERIALS AND METHODS

Gold nanoparticles (14 nm in diameter) linked to a specific antibody against liver cancer cell surface were selectively delivered (at various concentrations and incubation times) and selectevely delivered int liver cancer cells Following the treatment these drug resistant cells were irradiated using a 2w, 808 nm LASER.

RESULTS AND DISCUSSIONS

The post irradiation necrotic rate ranged from 57.3% (for 1 mg/L) to 92.3% (for 50 mg/L) at 60 seconds ($p<0.001$), while at 30 minute the necrotic rate increased from 63.2% (1 mg/L) to 89.1% (50 mg/L), p value<0.001. Significantly lower apoptotic rates were obtained in irradiated liver cancer treated with GNPs only (control) treated for 60 seconds and 30 minutes at concentrations ranging from 1 mg/L to 50 mg/L. We show here that the optimal LASER mediated necrotic effect of cancer cells after incubation with anti-LC-Ab was obtained at a concentration of 50 mg/L.

CONCLUSION

In the presented research, we obtained a very efficacious pulse laser mode treatment of individual LC cells with minimal effects on the surrounding medium, providing highly localized destruction only for tumor.