

Nanotechnology-Based Treatment of Liver Cancer

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Abstract : We present method of Nanoparticle enhanced laser thermal ablation of HepG2 cells (Human hepatocellular liver carcinomacell line), using gold nanoparticles combuned with a specific growth factor and demonstrate its selective therapeutic efficacy usig ex vivo specimens. Ex vivo-perfused liver specimens were obtained from hepatocellular carcinoma patients similarly to the surgical technique of transplantation. Ab bound to GNPs was inoculated intra-arterially onto the resulting specimen and determined the specific delivery of the nano-bioconjugate into the malignant tissue by means of the capillary bed. The extent of necrosis was considerable following laser therapy and at the same time surrounding parenchyma was not seriously affected. The selective photothermal ablation of the malignant liver tissue was obtained after the selective accumulation of Ab bound to GNPs into tumor cells following ex-vivo intravascular perfusion. These unique results may represent a major step in liver cancer treatment using nanolocalized thermal ablation by laser heating.

Keywords : HepG2 cells, gold nanoparticles, nanoparticle functionalization, laser irradiation

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020