

The current study aimed to develop gold nanoparticles (GNPs) and liposomes embedded gold nanoparticles (LGNPs) as drug carriers for temozolamide (TMZ), and investigate the possible therapeutic effects of intratracheal inhalation of nano formulation of TMZ-loaded gold nanoparticles (TGNPs) and liposomes embedded TGNPs (LTGNPs) against urethane induced lung cancer in BALB/c mice. Physicochemical characters and zeta potential studies for gold nanoparticles (GNPs) and liposomes embedded gold nanoparticles (LGNPs) were performed. The current study was conducted by inducing lung cancer chemically via repeated exposure to urethane in BALB/C mice. GNPs and LGNPs were exhibited in uniform spherical shape with adequate dispersion stability. GNPs and LGNPs showed no significant changes in comparison to control group with high safety profile, while TMZ-loaded gold nanoparticles (TGNPs) and liposomes embedded TGNPs (LTGNPs) succeed to improve all biochemical data and histological patterns. GNPs and LGNPs are promising drug carriers and succeeded in delivery of small and efficient dose of temozolamide in treatment lung cancer.

Antitumor activity was pronounced in animals treated LTGNPs, these effects may be due to synergistic effects resulted from combination of temozolamide and gold nanoparticles and liposomes may improve the drug distribution and penetration.

Keywords: intratracheal inhalation, chemotherapy, temozolamide, gold nanoparticles, liposomes.