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Abstract: Up to now, functionalized gold nanoparticles have been optimized as an effective intracellular in vitro delivery vehicle for siRNAs to interfere with the expression of specific genes by selective targeting, and provide protection against nucleases. Few examples however of suchlike in vivo applications have been described so far. In this study, we report the use of siRNA/RGD gold nanoparticles capable of targeting tumor cells in a lung cancer syngeneic orthotopic murine model. Therapeutic RGD-nanoparticle treatment resulted in successful targeting evident from significant c-myc oncogene down-regulation followed by tumor growth inhibition and prolonged survival of lung tumor bearing mice, possibly via ?v?3 integrin interaction. Our results suggest that RGD gold nanoparticles-mediated delivery of siRNA by intratracheal instillation in mice leads to successful suppression of tumor cell proliferation and respective tumor size reduction. These results reiterate the capability of functionalized gold nanoparticles for targeted delivery of siRNA to cancer cells towards effective silencing of the specific target oncogene. What is more, we demonstrate that the gold-nanoconjugates trigger a complex inflammatory and immune
response that might promote the therapeutic effect of the RNAi to reduce tumor size with low doses of siRNA.