Devise and manufacture of cysteamine functionalized-gold nanoparticles for detecting and expunging the tumor cells

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The aim of this study is to devise and manufacture intelligent inorganic nanoparticles that will be used imaging and expunging the tumor cells. Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells and if the spread is not controlled, it can result in death. If malignancies be detected before cells become cancerous or at an early stage, the disease will be most treatable. First gold nanoparticles were synthesized about 13-15 nm in diameter. Turkevich method was used for manufacturing gold nanoparticles. In this synthesis, into the 150 ml 2.2 mM sodium citrate solution at the situation of boiling was added 1 ml 46.8 mM HAUCl4 solution. The suspension was centrifuged at 9000 rpm for 20 min. Then the synthesized gold nanoparticles were examined by Zetasizer and Atomic Force Microscopy. In order to introduce positive charge, cysteamine molecules have two different end groups (SH and NH2) were coated as self-assembled monolayers (SAMs) onto gold nanoparticles. These molecules were reacted with the gold surface by SH groups and NH2 was given the positive charge. For this step, we have prepared of 1 mM solution of cysteamine. Then were prepared a solution with 1 ml gold nanoparticles and 225 µl cysteamine and shaked in the dark for 1 hour. Specific receptors exist on tumor cells that can be used to identify them. Antibodies are connecting specifically to receptors surface on the tumor cells. On the surface of nanoparticles can be immobilized siRNA for silent therapy and monoclonal antibody for cancer therapy.

Biography

Reza Didarian graduated in veterinary medicine from IRAN (2003) and have work experience in clinical training for 4 years. He is a PhD scholar in Nanotechnology and Nanomedicine Department in Hacettepe University, Turkey. His research area and thesis is about Treatment of Tumor Tissue with Hyperthermia Using Antibody Carrying Nanoparticles, under supervision of Prof. Dr. Erhan Piskin. He has certificate for laboratory animal use and have worked in TUBITAK project (Design and Production of Intelligent Inorganic Nanoparticles for Delivery and Imaging of Plasmid DNA and Antisense Oligonucleotides to Tumor Cells).

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