J Cancer Sci Ther 2013, 5:10
http://dx.doi.org/10.4172/1948-5956.S1.030

OMICS Group Conferences
Accelerating Scientific Discovery

3rd World Congress on
Cancer Science & Therapy

October 21-23, 2013 DoubleTree by Hilton Hotel San Francisco Airport, CA, USA

Novel drug delivery system based on doxorubicin-loaded magnetic nanoparticles modified with biocompatible copolymer as a therapeutic strategy against lung cancer cells

Abolfazl Akbarzadeh, Amir Ahmad Khandaghi and Soodabeh Davaran
Tabriz University of Medical Sciences, Iran

In the field of cancer therapy, magnetic nanoparticles modified with biocompatible copolymer are promising vehicles for the delivery of hydrophobic drugs such as doxorubicin. The major aim of this effort was to evaluate whether doxorubicin-loaded magnetic nanoparticles improved the anti-tumor effect of free doxorubicin in lung cancer cells. A series of PLGA-PEG triblock copolymer were synthesized by ring-opening polymerization of D, L-lactide and glycolide with polyethylene glycol (PEG_{4000}) as an initiator. The bulk properties of these copolymer were characterized using ^1H nuclear magnetic resonance spectroscopy, gel permeation chromatography, Fourier transform infrared spectroscopy, and differential scanning calorimetry. Three doxorubicin-loaded magnetic nanoparticles were synthesized by the double emulsion method (w/o/w). Cytotoxic assays were evaluated in lung carcinoma (A549) cells treated by the MTT assay technique. In addition, the particles were characterized by X-ray powder diffraction, scanning electron microscopy, fourier transform infrared spectroscopy, and vibrating sample magnetometry. The anti-proliferative effect of doxorubicin appeared much earlier when the drug was encapsulated in magnetic nanoparticles than when it was free. Doxorubicin-loaded magnetic nanoparticles significantly enhanced the decrease in IC50 rate. The in vitro cytotoxicity test showed that the Fe_3O_4-PLGA-PEG_{4000} magnetic nanoparticles had no cytotoxicity and were biocompatible. The chemotherapeutic effect of free doxorubicin on lung cancer cells is improved by its encapsulation in modified magnetic nanoparticles. This approach has the prospective to overcome some major limitations of conventional chemotherapy and may be a promising strategy for future applications in lung cancer therapy.

Keywords: Magnetic Nanoparticles, Doxorubicin, Drug Delivery, Lung Cancer.

akbarzadehab@tbzmed.ac.ir, davaran@tbzmed.ac.ir

Neurocognitive rehabilitation among patients with Glioma brain tumors

Afsaneh Zarghi
Center of Shahid Beheshti University of Medical Sciences, Iran

This lecture will address a variety of neurocognitive cancer-related topics for pre-clinical evaluation of candidate therapeutics for treating brain tumors, and will include the discussion of: maintenance options for neuro cognitive change in glioma; the importance of appropriate neurocognitive assessment before and after surgery; brain tumor computerized approaches for brain rehabilitation; factors affecting experimental outcomes; use of computerized assessments and associated treatment and administration options; and novel combination therapies. The study was to determine the diagnostic role of cognitive tests of CPT, Stroop and TOL in assessing the neurocognitive impairments among patients with brain tumor and healthy participants. A cross-sectional study was done on a sample 84 patients with glioma brain tumors and 84 healthy ones aged 15 to 65. Participants of both groups were examined and approved by neurosurgeons, neurologists and psychiatrists and referred to the neuroscientist for performing the tests. A significant difference was observed between the performance of both groups of participants in age, sex and education variables ($P<0.05$). Patients with glioma brain tumors met more cognitive changes relating to sustained, selective attention and planning in comparison to healthy participants. Therefore, diagnosis and assessment of these cognitive changes before and after the surgery can help to rehabilitate their brains considerably and improve their lives quality. In addition to these subjects, attendees of this lecture will be familiarized with the need for neurocognitive testing of candidate therapeutics, so that only the most promising therapies are advanced to clinical trial evaluation of efficacy when treating brain tumor patients.

Biography

Afsaneh Zarghi is researching in the field of health & rehabilitation for 8 years. The last 4 years, in which she was writing her Ph.D. thesis, were spent exclusively on investigating the modern methods of neurocognitive rehabilitation of the patients with brain tumor resulting in several books and papers. She received her MD, MPH and Ph.D. in cognitive neuroscience and she is the editor-in-chief of the *Clinical Neuroscience* journal. She is the manager of the Neuroscience & Neurocognitive Rehabilitation Department, Functional Neurosurgery Research Center of Shahid Beheshti University of Medical Sciences, Tehran, Iran. She is currently a member of the U.S. SCR community.

Dr.a.zarghi@hotmail.com