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ORIGINAL ARTICLE **OPEN ACCESS**

Fibronectin using gold nanoparticles attached to antibodies for early detection of lung cancer

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ABSTRACT
Lung cancer is a global problem which is known as the time of diagnosis, it is the most important factor in the recovery process. The disease is usually diagnosed when the tumor cells grow in CT images show that it must be noted at this point to recognize is a little late. Fibronectin is a protein component of the extracellular matrix (ECM) produced by different cells, especially fibroblasts. The purpose of this study was to identify the Fibronectin expression in cancer cells using gold nanoparticles (GNP) for early detection of lung cancer.
Keywords: *lung cancer, anti-fibronectin, gold nanoparticles, Phytochemistry, Chemistry*

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INTRODUCTION

Lung cancer is one of the most common causes of death in most countries are in Lung cancer incidence rate of 20% in the rest of the world is increasing rapidly for a disease [1]. While lung cancer can be detected in CT images show [2]. Methods such as examination of sputum for cancer cells, photographs and samples of Bronchoscopy chest and, if necessary, other methods of diagnosis of lung cancer is [3]. Time is very important to see a doctor, patients usually go to the doctor when the disease has progressed from chest pain [4]. Nano-sized particles of roughly 1 to 100 nanometers, and because of the variety of ways of measuring absorbance, fluorescence, Raman emission, magnetic, electrical and Electron microscopy (TEM) can be used to identify markers are well designed Biosensors [5].

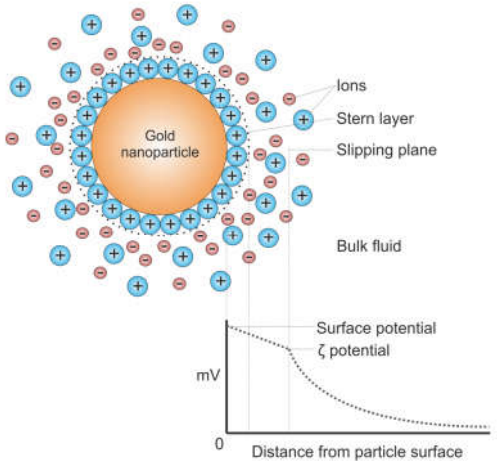

Figure 1: Gold Nanoparticles and its layers

Of the particles in the detection of DNA, proteins, microorganisms used [6]. The nanoparticles are of great use in medicine are gold nanoparticles [7]. Thermal and optical properties of gold nanoparticle probes and integrated them apart because of specific biomarkers, to be used as a diagnostic tool [8]. One of the

advantages of gold nanoparticles to biomolecules is easy connection [9]. Gold nanoparticles can be connected to proteins through covalent bonds have a strong and reliable [10].

MATERIALS AND METHODS

In this project a method Compact aglet gold nanoparticles were synthesized using HAuCL4 and Sodium Citrate as well as the heads of the lung cells of A549 Cell Line as cell lung cancer cells and normal cells and Nalm-6 AGO as a form of leukemia and cancer in broth DMEM containing antibiotics - anti-mycotic and FBS in the culture room under sterile conditions, were cultured.

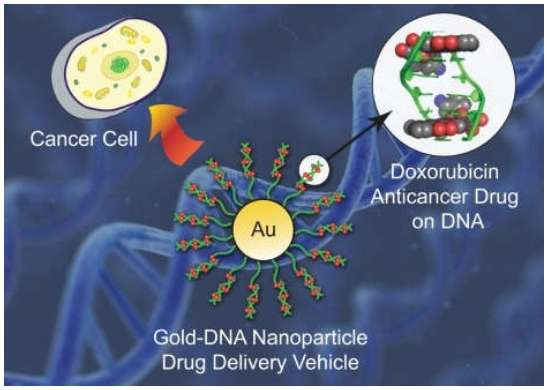

Figure 2: Connecting and absorption of gold nanoparticles to cells and DNA molecules

Then the next step is to bind antibodies to gold nanoparticles, the nanoparticles synthesized in different sizes to suit different concentrations of antibodies and antibody was also diluted with PBS with 14mg / ml were produced.

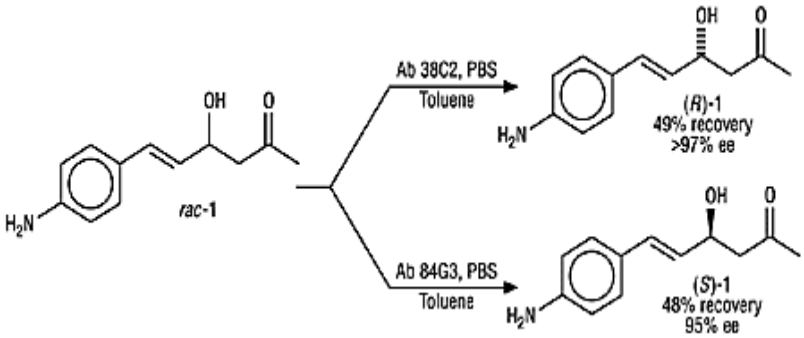

Figure 3: chemical structure of toluene and the optical density

Always the binding of antibodies to gold nanoparticles were identical in terms of temperature and Ph. In each phase diagrams 400,800nm spectrophotometer at wavelengths were plotted and compared.

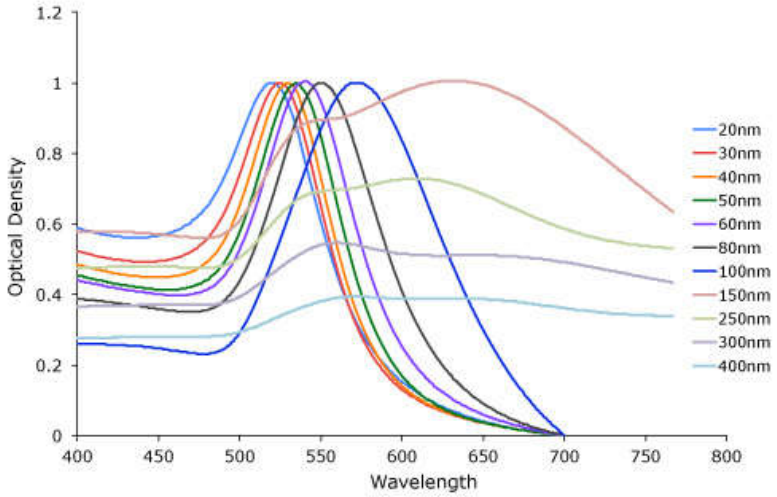

Figure 4: The light absorption of antibodies in the spectrophotometer

To investigate the interaction of nanoparticles attached to antibodies to Fibronectin Matrix cancer cells, cells in culture were washed out after a period of time of incubation. The solution prepared nanoparticles with antibodies that were made before they were added. After adding the solution changed from red to purple color was observed that the sign test is done properly.

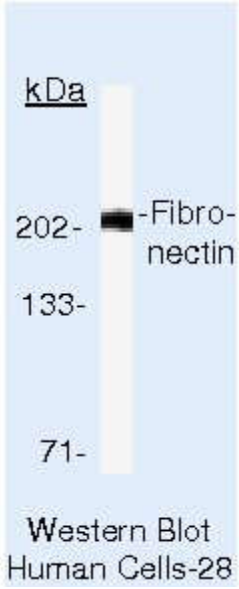

Figure 5: the protein fibronectin

RESULT AND DISCUSSION

Nanoparticles were prepared by the project in three sizes, all the way Tvrkvych 10, 20, 35nm were synthesized in aqueous environment. The most important determinant of the size of the nanoparticles, the color of the final solution and the absorption of the color gold nanoparticles of different sizes, different and also increased absorption of nanoparticles size increases. Nanoparticles with a size of 35 nm and the absorption of the anti-Fibronectin binding showed that the sizes were used in the testing stages. Then the gold nanoparticles were attached to antibodies Fibronectin to verify proper connection between them Nacl Coagulation tests was used. Since NaCl bringing musical nanoparticles, in the test according to the Coagulation can be detected by anti-Fibronectin Fibronectin was informed attached to gold nanoparticles. The nanoparticles attached to this exposure of cells (cell lung cancer, lung cancer cells and normal cells as a negative control group). According to figures obtained from spectrophotometric highest concentration of gold nanoparticles on lung cancer cells was due to the high Fibronectin.

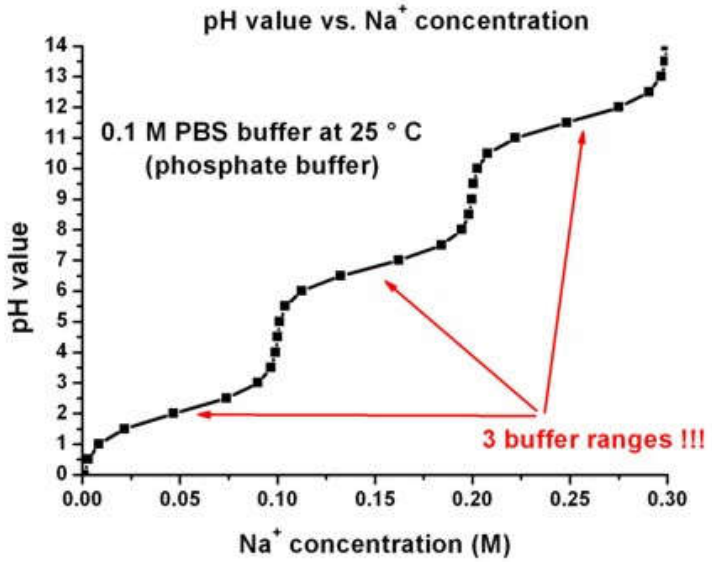

Figure 6: Graph of the strength of hydrogen absorption buffer and sodium

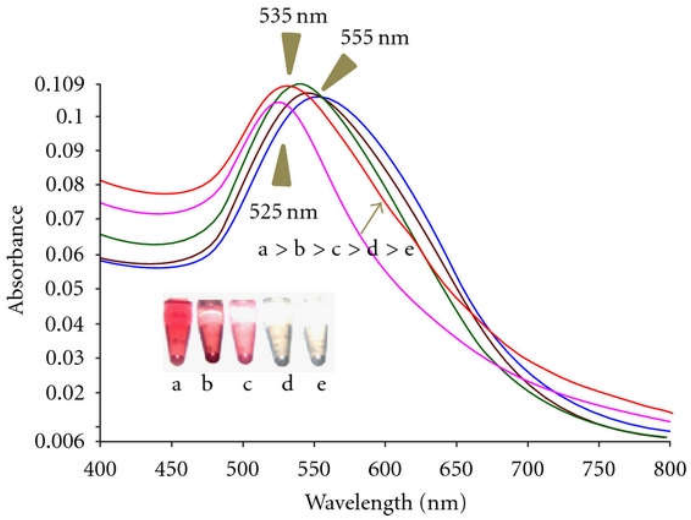

Fig 6

A) Nanoparticles
B) Nanoparticles attached to antibodies to non-cancerous cells (fibroblasts
C) Nanoparticles attached to antibodies to cancer cells (leukemia)
D) Nanoparticles attached to antibodies to lung cancer cells (A549)
E) PBS buffer

CONCLUSION

With the increasing development of science and technology in modern societies, the multiplicity and treatment of various diseases and some are indistinguishable, Various cancer to infectious diseases that are of unknown origin, People are always worried and why scientists have been working on new research.

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