عنوان مقاله:

Radioimmunoscintigraphy of Breast Tumor Xenografts in Mouse Model by 99mTc Direct Radiolabeling of a Monoclonal Antibody PR81

محل انتشار:

مجله فیزیک پزشکی ایران, دوره 2, شماره 3 (سال: 1384)

تعداد صفحات اصل مقاله: 8

نویسندگان:

M. Salouti - *Ph.D. Student in Medical Physics, Medical Physics Dept., Tarbiat Modarres University, Tehran, Iran*

.H. Rajabi - *Assistant Professor, Medical Physics Dept., Tarbiat Modarres University, Tehran, Iran*

H. Babaei - *Assistant Professor, Radioisotope Dept., Nuclear Research Center, Atomic Energy Organization of Iran, .Tehran, Iran*

.M.J. Rasaee - *Professor, Medical Biotechnology Dept., Tarbiat Modarres University, Tehran, Iran*

خلاصه مقاله:

Introduction: The radioimmunoscintigraphy (RIS) has found widespread clinical applications in tumor diagnosis. Human epithelial mucin, MUC1, is commonly over expressed in adenocarcinoma including 80% of breast cancers and represents a useful target for RIS. The PR81 is a new murine anti-MUC1 monoclonal antibody that was found to react with the membrane extracts of several human breast cancerous tissues and the cell surface of some MUC1 positive cell lines. In this study, a direct method which is very simple, rapid and efficient for the labeling of this MAb with 99mTc, particularly suitable for the development of a 'kit', was developed. The quality control of new radiopharmaceutical and immunoscintigraphy studies in BALB/c mice bearing breast tumor xenografts were also performed. Materials and Methods: The Ab reduction was performed with 2-mercaptoethanol (2-ME) at a molar ratio of 2000:1 (2-ME:MAb) and reduced Ab was labeled with 99mTc via methylene diphosphonate (MDP) as a transchelator. The labeling efficiency was determined by ITLC. The amount of radiocolloids was measured by cellulose nitrate electrophoresis. The stability of the labeled product was checked in fresh human serum by gel filtration chromatography (FPLC) over 24 hrs. The integrity of the labeled MAb was checked by the means of SDS-PAGE. Cell-binding assay was used to test the binding ability of 99mTc-PR81 to MCF7 cells. Biodistribution was studied in normal BALB/c mice at 4 and 24 hrs post-injection. The tumor imaging was performed in female BALB/c mice with breast tumor xenografts 24 hrs after the new complex injection. Results: The labeling efficiency was 94.2%±2.3 and radiocolloids were 2.5%±1.7. In vitro stability was 70% ±5.7 in fresh human serum over 24 hrs. There was no significant Ab fragmentation due to the labeling procedure. Both the labeled and unlabeled PR81 were able to compete for binding to MCF7 cells. The biodistribution studies in normal BALB/c mice showed that there was no important accumulation in any organ. The immunoscintigraphy studies demonstrated definite localization of the preparation at the site of tumors with high sensitivity. Discussion and Conclusion: The results show that by using the Schwarz method of radiolabeling MAb PR81, a labeling yield higher than 90% with high stability of the complex in human serum can be obtained. These ... findings demonstrated that the new radiopharmaceutical can be considered as a promising candidate

کلمات کلیدی:
Breast Cancer, MUC1, Monoclonal antibody, Technetium, 99m, Radiolabeling, Radioimmunoscintigraphy