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MONOCLONAL ANTIBODIES FOR THE IMMUNORADIOMETRIC ASSAY (IRMA). Keigo Endo. Department of Nuclear Medicine, Kyoto University Hospital, Kyoto.

Hybridoma technology has become very efficient for the production of large numbers of monoclonal antibodies. These monoclonal antibodies recognize specific antigens, which may be difficult to purify. New cancer marker such as CA19-9, CA125 and CA15-3 have been developed by applying hybridoma technology and are clinically very useful for the management of various cancers. Because of the mass production of antibodies from ascitic fluid and its homogeneity, monoclonal antibodies are of great use as a tracer and a catcher in the IRMA. The procedure of IRMA is very simple and the assay is more sensitive and specific comparing to the competitive RIA. Therefore, many in vitro assays employ IRMA systems using monoclonal antibodies rather than competitive RIA that use radioiodinated antigen as a tracer.

Recently we have generated two monoclonal antibodies designated 130-22 and 145-9, recognizing CA125 antigen but binding to different epitopes from OC-125 antibody. By employing OC-125 as a tracer and 130-22 or 145-9 as a catcher, we have developed a very sensitive IRMA for detecting CA125. Currently used CA125 IRMA kits used OC125 antibody both as a tracer and a catcher, whereas 130-22 or 145-9 and OC-125 recognize different antigenic determinants, leading to a sensitive IRMA for measuring CA125 antigen. Thus, the selection of the most useful antibodies and the characterization of antigens reactive with antibodies has taken more work than the effort spent obtaining them.

Anti-tumor monoclonal antibodies are also expected to deliver radionuclides or anti-neoplastic drugs to target tissues. Radiolabeled antibodies are widely used for the localization of tumors. Although there are many things to overcome, monoclonal antibodies opened new era in nuclear medicine.

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HIGHLY SENSITIVE ENZYME IMMUNOASSAY. A. Tsuji and M. Maeda. Showa University, School of Pharmaceutical Sciences, Tokyo.

Since Van Weemen and Schuurs developed enzyme immunoassay (EIA) using peroxidase (POD) as a label instead of isotope in 1972, various non-isotopic immunoassays have been developed. Recently, EIAs for drugs, insulin CEA etc., are available and can be used in diagnosis. Various new non-isotopic probes have been developed and many assay systems ,such as homogeneous immunoassay, have also established. Recent non-isotopic immunoassays are developing to aim at high sensitivity. In this lecture we present the outline of highly sensitive non-isotopic immunoassays and the chemiluminescence/fluorescence EIAs developed in our laboratory as follows:

	Enzyme	Analyte
1.Fluorescence EIA	POD	TSH, 17-OHP, 21-DOF
	GOD	T4, 17-OHP, FT4
2.Chemiluminescence EIA	POD	F, DHEA, Insulin
	GOD	T4, 17-OHP, α-FP Insulin
	β-Gal	Drugs (17-OHP)
3.ELISA	POD	T4, 17-OHP, TSH
	GOD	FT4

POD: Peroxidase, GOD: Glucose oxidase, β-Gal:β-D-Galactosidase

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B/F SEPARATION IN RIA. R. Demura and H. Demura. Tokyo Women's Medical College, Tokyo.

Since the original application of paper-chromatoelectrophoresis for a separation of B/F in RIA, a wide variety of separation techniques has been used to make the assay sensitive, simple and quick. Double antibody method is one of the most frequently used technique with merits of specificity and uniformity. A shortage of the method, a long second incubation time was improved by an addition of PEG or dextran to facilitate precipitation. Solid-phase RIA is growing since no other separation is needed. Polystyrene tube, beads, sepharose, magnet, etc. attached with antibody or antigen are employed for the assay. Solid-phase assay has advantages in speed, sensitivity and precision and two-site immunoradiometric assay (IRMA) was developed based on solid phase RIA. Prozone phenomenon occurs sometimes by an interference of reversible reaction by excess antibody or antigen and proposes hazards for clinical application. Solid-phase RIA became popular by an aplication of monoclonal antibody and provided basis for automated RIA system. Charcoal or dextran-coated charcoal and PEG methods are applicable to all kinds of materials because charcoal adsorbs wide variety of molecules and PEG precipitates various macromolecules depending on the concentration of the solution. These methods are conveniently used for a separation of either small or big molecules such as steroids, autoantibodies or receptors or applicable for so called quick RIA.