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Radioimmunoassay (RIA)

Radioimmunoassay (RIA) may be defined as when radioisotopes instead of enzymes are used as labels to be conjugated with antigen or antibodies, the detection of the antigen-antibody complex is called radioimmunoassay (RIA)

Radioimmunoassay (RIA) is an in vitro assay that measures the presence of an antigen with very high sensitivity. RIA was first described in 1960 for the measurement of endogenous plasma insulin by Solomon Berson and Rosalyn Yallow.

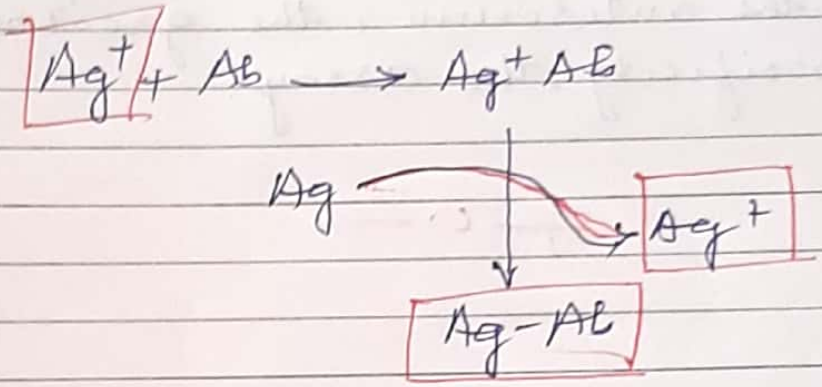
The technique has revolutionized the estimation of several compounds in biological fluids that are found in exceeding low concentrations

Principle:

Radioimmunoassay combines the principles of radioactivity of isotopes and immunological reactions of antigen and antibody.

The Principles of RIA is primarily based on the competition between the labelled and unlabelled antigen to bind with antibody to form antigen-antibody complex. The unlabelled antigen is the substance to determined. The antibody (Ab) is then subjected to react with unlabelled antigen in

the presence of excess amount of isotopically labelled (131) antigen (Ag^+) with known radioactivity. There occurs a competetion between the antigen (Ag^+ and (Ag) to bind the antibody. Certainly the labelled Ag^+ will have an upper hand due to its excess presence.



Since the concentration of unlabelled antigen (Ag) increases the amount of labelled antigen - Antibody couple (Ag^+ Ab) decreases. Thus the concentration of Ag^+-Ab is inversely related to the Concentration of unlabelled Ag ie. Substance to be determined. This relation is almost linear. A Standard curve can be drawn by using different concentration of unlabelled antigen and the same quantities of antibody and labelled antigen.

The labelled antigen - Antibody (Ag^+ - Ab) complex is separated by precipitation. The radioactivity of 131I

Present is Ag+-Ab is determined.

Applications: Radioimmunoassay (RIA) is widely used because of its great sensitivity. Using antibodies of high affinity, it is possible to detect a few picogram of hormone to the tube.

The greater the specifity of the antiserum, the greater the specificity the assay.

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