

Coombs Test

A **Coombs test** (also known as antiglobulin test or AGT) is used in immunohematology and immunology. There are two types of Coombs tests:

- I. **Direct Coombs test (DCT) or direct antiglobulin test (DAT)**
- II. **Indirect Coombs test or indirect antiglobulin test or (IAT).**

Direct Coombs test is used to demonstrate the sensitization of RBCs *in vivo* with IgG antibodies and/or complement components (C3b, C3d and C4).

The Application of this test:

- **Hemolytic transfusion reactions**
- **Hemolytic disease of the fetus and newborn**
- **Autoimmune hemolytic anemia**
- **Red blood cell sensitization**

Procedure:

- 1- Blood sample is taken (1ml)
- 2- The RBCs are washed (with normal saline / 3ml) to removing the patient's own plasma, repeated three times.
- 3- Incubated with antihuman globulin (also known as "Coombs reagent") for 30 minutes.

The result: If this produces agglutination of RBCs, the direct Coombs test is positive, a visual indication that antibodies (and/or complement proteins) are bound to the surface of red blood cells.



The indirect Coombs test:

Detects antibodies that are present unbound in the patient's serum. This test is performed to detect presence of Rh-antibodies or other antibodies in patient's serum in case of the following:

- a. To check whether an Rh-negative women has developed Anti Rh-antibodies.**
- b. Transfusion of Rh positive blood**

Procedure

- 1-** Serum is extracted from the blood sample taken from the patient.
- 2-** Then, the serum is mixing with RBCs of known antigenicity(most common O+VE blood group) after wash 3 time
- 3-** Incubate with AHG for 30 minutes.

The result

If agglutination occurs, the indirect Coombs test is positive. Because the AHG was bind to Ab and the agglutination appear.