

# Anti - AB Monoclonal Antibodies For ABO Grouping

**FOR IN VITRO USE ONLY****INTRODUCTION**

The ANTI-AB Monoclonal Antibodies are in vitro culture supernatant of hybrids obtained by cellular fusion (Hybridoma Technology).

**INTENDED USE**

The Anti-AB Monoclonal antibodies are used for determination of the presence or absence of "A" & "B" Antigen on Human Red blood cells . The Reagent is used in forward typing to detect the ABO blood group in human whole blood. The test is for in vitro diagnostic use only.

**GROUPING PRINCIPLE**

The ABO Grouping is defined both by the presence of 'A' and/or 'B' Antigens on the surface of the red blood cells and by the simultaneous presence of anti-A and / or anti-B antibodies in the serum. An individual has in his serum the antibodies corresponding to the antigens which are not on his Red Blood cells. It is thus necessary to identify the erythrocyte antigens by the known ANTI- A, ANTI-B and ANTI-AB Monoclonal Antibodies (forward typing) and then confirm the results by verifying the presence of corresponding antibodies in the blood serum to be tested with control cells: 'A1', 'A2', 'B' and 'O'. (Reverse Typing). Human Red blood cells, possessing 'A' and/or 'B' Antigen will agglutinate in the presence of antibody directed towards the antigen. For example agglutination of RBCs with Anti-AB Monoclonal Antibodies indicates the presence of 'A' and/or 'B' Antigen on the red blood cells.

**STORAGE AND PACK SIZE:**

The ANTI-AB Monoclonal Antibodies are packed in 10 ml dropper vial. The antibodies are stable at 2-8°C until the expiry date mentioned on the reagent vial label. Sodium azide is added to the antibodies at 0.1% concentration as preservative.

**SAMPLE COLLECTION:**

Blood sample should be collected with a suitable anticoagulant in a sterile stoppered container & should be tested immediately.

If testing is delayed, blood should be stored at 2-8°C & must be examined not later than 48 hours. Haemolysed samples should not be used for testing and clotted blood should be used within 24 hours of collection.

**Rouleaux:** It is checked to ensure that the Antisera does not give pseudo agglutination in which the red blood cells look like pile of coins.

**Avidity, Intensity, titre, specificity, Haemolysis, prozone and rouleaux of Anti-AB Monoclonal Antibodies are as per I.P standards.**

**PERFORMANCE CHARACTERISTICS**

The Performance of Anti-AB Monoclonal antibodies has been evaluated on more than 1500 samples (Donor, clinical, Antenatal and neonates) in comparison with established Antisera. The performance has been evaluated for Avidity, Intensity, Potency (Tire) and specificity on these samples. All samples have been correctly characterized with 100% sensitivity and specificity and results are in compliance to common technical specification of in-vitro medical devices under recommended methods. The performance has also been evaluated for Reactivity (Haemolysis, Prozone, Rouleaux) of Anti-AB Monoclonal and it complies the IP (Indian pharmacopeia) standards.

**PROBLEMS IN Rh TYPING**

The ABO Group of an individual can only be clearly determined if the results of forward & reverse typing match properly. Following factors are responsible for discrepancies in ABO Grouping :

1. Improper identification of specimen.
2. Improper techniques like,
  - Cell to reagent ratio.
  - Failure to identify haemolysis
  - Improper storage of Reagents.
3. Improper centrifuge calibration resulting in over/ under centrifugation.
4. Patients may fail to express ABO antigens on red cells due to diseases like Leukemia & lymphoma.
5. Acquired B antigen can occur due to Infections; gram negative septicemia, carcinoma colon, Blood Group chimera ie an individual with two population of cells which may occur as a result of either Bone marrow transplantation or Transfusion of group 'O' blood to 'A' or 'B' patient.
6. Rouleaux formation: It occurs in patients with abnormal Albumin/globulin concentration or in cord blood samples due to Whartons Jelly contamination.
7. Acquired antibodies ie
  - Anti- A1 in A2 persons
  - Anti- H in Bombay phenotype
  - Cold auto - antibodies
  - Unexpected allo-antibodies.

**BIBLIOGRAPHY**

- KHOLER G., MILSTEIN C., 1975 Continuous culture of fused cells secreting

*in vitro* diagnostic Reagent, not for medicinal use

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## DESCRIPTION OF SYMBOLS USED

The following are graphical symbols used in or found on J. Mitra diagnostic products and packing. These symbols are the most common ones appearing on medical devices and their packing. They are explained in more detail in the European Standard EN ISO 15223-1:2021.

	Manufactured By		In vitro diagnostic medical device
	Catalogue Number		Instruction for use
	Lot Number Batch Number		Temperature Limitation
	Manufacturing Date		Caution See instruction for use
	Expiry Date		Keep away from sunlight
	Do not use if package is damaged		Contains biological Material of Animal Origin
	Keep Dry		Country of Manufacture

## WARNING FOR USERS

 **CAUTION:** ALL THE SAMPLES TO BE TESTED SHOULD BE HANDLED AS THOUGH CAPABLE OF TRANSMITTING INFECTION. NO TEST METHOD CAN OFFER COMPLETE ASSURANCE THAT HUMAN BLOOD PRODUCTS WILL NOT TRANSMIT INFECTION.

1. The use of disposable gloves and proper biohazardous clothing is STRONGLY RECOMMENDED while running the test.
2. In case there is a cut or wound in hand, DO NOT PERFORM THE TEST.
3. Do not smoke, drink or eat in areas where specimens or kit reagents are being handled.
4. Tests are for professional use only and should be run by competent person only.
5. Do not pipette by mouth.
6. Mark the test specimen with patient's name or identification number. Improper identification may lead to wrong result reporting.
7. Test shall be performed at room temperature (20°C to 30°C).
8. Bring the reagent and specimen at room temperature (20°C to 30°C).
9. All materials used in the assay and samples should be decontaminated in 5% sodium hypochlorite solution for 30-60 min. before disposal or by autoclaving

at 121°C at 15psi for 60 min. Do not autoclave materials or solution containing sodium hypochlorite. They should be disposed of in accordance with established safety procedures.

10. Wash hands thoroughly with soap or any suitable detergent, after the use of the kit. Consult a physician immediately in case of accident or contact with eyes, in the event that contaminated material are ingested or come in contact with skin puncture or wounds.
11. Spills should be decontaminated promptly with Sodium Hypochlorite or any other suitable disinfectant.
12. The monoclonal antibodies contain Sodium Azide as a preservative. If these material are to be disposed off through a sink or other common plumbing systems, flush with generous amounts of water to prevent accumulation of potentially explosive compounds. In addition, consult the manual guideline "Safety Management No. CDC-22", Decontamination of Laboratory Sink Drains to remove Azide salts" (Center for Disease Control, Atlanta, Georgia, April 30, 1976.)

## ADDITIONAL MATERIALS REQUIRED

Glass slides, Test tubes (10X75mm), Pasteur Pipettes, Normal saline, Beakers, Centrifuge, Timer & Mixing sticks.

## GROUPING TECHNIQUE

Separate the RBCs from the serum or plasma by centrifuging at 5000 rpm for 5 min. The ABO Grouping is performed at room temperature by:

- (a) Slide or tile method.
- (b) Tube method.
- (c) Microplate Method.

(a) **Slide Method:** It is used mainly for emergency ABO Grouping especially in out door camps whole blood sample.

Place one drop each of Anti-AB Monoclonal Antibodies on a slide. Now add one drop of whole blood sample to each of the antibodies. Mix the cells and antibodies with clean mixing stick & spread the mixture over an area of 2 cm. Rock the slide gently from side to side & observe for the agglutination within one minute.

- (b) **Tube Method:** Take one drop each of Anti-AB Monoclonal Antibodies in a test tubes. Make 3-4% red cell suspension of washed RBCs (to be tested) & add one drop to the tube. Shake well to mix the antibodies & cell suspension. Incubate for two minutes at room temperature & then centrifuge at 1000 rpm for one minute. Gently shake the tube in such a way to dislodge the pellet. If the

red cells separate in one or more clumps, the reaction is positive. If shaking gives a homogeneous suspension again, the reaction is interpreted as negative.

- (c) **Microplate Method:** Microplate method is ideal for testing large no. of blood samples. Microplates are polystyrene plates having 96 small wells (either 'V' shaped type, flat bottom or 'U' type). Add one drop of Anti-AB Monoclonal Antibodies to a well & add one drop of 2 - 4% cell suspension to the well. Gently shake to mix the antibodies and cells. Incubate at room temperature for 30 mins.

Gently shake the plate by tapping the side of the plate & read the results.

## INTERPRETATION

**SLIDE AND TUBE METHOD:** Agglutination of the red blood cells with the antibodies is a positive test indicating the presence of 'A' and/or 'B' antigen on the cells and no agglutination indicates the absence of 'A' and/or 'B' antigen on the cells.

**QUALITY CONTROL:** Each batch of Anti - AB Monoclonal Antibodies is subjected to stringent internal quality control regarding specificity, avidity, intensity and titre to ensure constant quality of antibodies.

**Avidity:** It is defined as the reactivity time (in seconds) taken by the antibodies to show the agglutination and is tested by slide method with 40% red cells suspension.

**Intensity:** It shows the strength of the reaction ie clumping. It is tested by slide method with 40% red cells suspension & is graded as :

- +/- Doubtful for agglutination. Repeat test.
- +1- Small clumps scattered in the test area
- +2- Two or more clumps of equal size
- +3- One big clump with some small clumps
- +4- One big clump in the centre.

**Titre:** Titre is checked by tube method with 2-5% cell suspension. It is defined as the reciprocal of highest dilution of antibodies which gives agglutination. The reagent is diluted up to 512 dilution by two fold serial dilution.

**Specificity:** It is checked to ensure whether the reagent is specific for the purpose or not. For example specificity of Anti-AB Monoclonal Antibodies is checked with 'O' cells.

**Haemolysis:** It is checked to ensure that cells do not get haemolysed during specificity testing.

**Prozone:** It is checked by tube method to ensure that no negative reactions are obtained with low dilution of the Antisera.