

# MONOCLONAL BLOOD GROUPING REAGENTS

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## DIRECTIONS FOR USE

### Anti-A, Anti-B and Anti-A,B Monoclonal:

For Tube, Bio-Rad-ID, Ortho BioVue, Microplate and Slide Techniques.

## SUMMARY

In 1900, Landsteiner discovered the serum of some people would agglutinate the red cells of others. Four common phenotypes are now recognised: O, A, B and AB. Subgroups of A and B have since been identified.

Forward Group			Reverse Group				ABO Phenotype	Caucasians %
A	B	A,B	A1	A2	B	O		
+	0	+	0	0	+	0	A	42
0	+	+	+	+	0	0	B	10
0	0	0	+	+	+	0	O	44
+	+	+	0	0	0	0	AB	4

## INTENDED USE

The ABO reagents are blood grouping reagents intended to be used to qualitatively determine the presence or absence of the A and or B antigens on the red cells of blood donors or patients requiring a blood transfusion when tested in accordance with the recommended techniques stated in this IFU.

## PRINCIPLE

The reagents contain antibodies against the appropriate A and/or B antigen on human red cells and will cause direct agglutination (clumping) of red cells that carry the corresponding ABO antigen. No agglutination generally indicates the absence of the Corresponding ABO antigen on human red cells (see limitations).

## REAGENT

Rapid Labs Monoclonal IgM ABO blood grouping reagents contain mouse monoclonal antibodies diluted in a phosphate buffer containing sodium chloride, EDTA and bovine albumin. The reagents do not contain or consist of CMR substances, or endocrine disrupting substances or that could result in sensitization or an allergic reaction by the user. Each reagent is supplied at optimal dilution for use with all the recommended techniques stated below without the need for further dilution or addition. For lot reference number and expiry date see Vial Label.

Product	Cell Line/Clone	Colour	Dye Used
Anti-A	9113D10	Blue	Patent Blue
Anti-B	9621A8	Yellow	Tartrazine
Anti-A,B	152D12 + 9113D10 + ES15	Colourless	None

## STORAGE

Reagent vials should be stored at 2 - 8°C on receipt. Prolonged storage at temperatures outside this range may result in accelerated loss of reagent reactivity. This reagent has undergone transportation stability studies at 37°C and -25°C as described in document BS EN ISO 23640:2015.

## SAMPLE COLLECTION AND PREPARATION

Blood samples can be collected into EDTA, citrate, CPDA anticoagulants or as a clotted sample. The samples should be tested as soon as possible following collection. If a delay in testing should occur, store the samples at 2-8°C. Samples displaying gross haemolysis or microbial contamination should not be used for testing. Blood samples showing evidence of lysis may give unreliable results. It is preferable (but not essential) to wash all blood samples with PBS or Isotonic saline before being tested.

## PRECAUTIONS

- The reagents are intended for in vitro diagnostic use only.
- If a reagent vial is cracked or leaking, discard the contents immediately.
- Do not use the reagents past the expiration date (see Vial Label).
- Do not use the reagents if a precipitate is present.
- Protective clothing should be worn when handling the reagents, such as disposable gloves and a laboratory coat.
- The reagents have been filtered through a 0.2 µm capsule to reduce the bio-burden, but is not supplied sterile. Once a vial has been opened the contents should remain viable up until the expiry date as long as there is no marked turbidity, which can indicate reagent deterioration or contamination.
- The reagents contain < 0.1% sodium azide. Sodium azide may be toxic if ingested and may react with lead and copper plumbing to form explosive metal azides. On disposal flush away with large volumes of water.
- No known tests can guarantee that products derived from human or animal sources are free from infectious agents. Care must be taken in the use and disposal of each vial and its contents.

## DISPOSAL OF REAGENT AND DEALING WITH SPILLAGES

For information on disposal of the reagent and decontamination of a spillage site see Material Safety Data Sheets, available on request.

## CONTROLS AND ADVICE

- It is recommended that a positive control and a negative control be tested in parallel with each batch of tests. Tests must be considered invalid if controls do not show expected results.
- Since these reagents do not contain macromolecular potentiators, it is very unlikely that false positive reactions are caused with IgG coated cells.
- Blood specimens of weak A or B subgroups (e.g Ax) may give rise to false negative or weak reactions when tested using slides, microtitre plates or gel cards. It is advisable to re-test weak subgroups using tube technique.
- Individuals older than six months should have their ABO blood-grouping results confirmed by testing their serum or plasma against known group A1 and B cells before their ABO blood group can be confirmed.
- Before use, let the reagent warm up to room temperature. As soon as the reagent has been used, put the reagent back in storage at 2-8°C.
- In the Recommended Techniques one volume is approximately 50µl when using the vial dropper provided.
- The use of the reagents and the interpretation of results must be carried out by properly trained and qualified personnel in accordance with the requirements of the country where the reagents are in use.
- The user must determine the suitability of the reagent for use in other techniques.

## REAGENTS AND MATERIALS REQUIRED

- Applicator sticks.
- Automatic plate reader.
- Bio-Rad ID-Cards (NaCl, Enzyme tests and cold agglutinins).
- Bio-Rad ID-Centrifuge.
- Bio-Rad ID-CellStab or ID-Diluent 2.
- Glass microscope slides or white card tiles.
- Glass test tubes (10 x 75 mm or 12 x 75 mm).
- Microplate centrifuge.
- Ortho BioVue System Cassettes (Neutral).
- Ortho BioVue System Centrifuge.
- Ortho 0.8% Red Cell Diluent.
- Plate shaker.
- PBS solution (pH 6.8-7.2) or Isotonic saline solution (pH 6.5-7.5).
- Positive and negative control red cells:
  - Anti-A: group A (positive control) and group O (negative control).
  - Anti-B: group B (positive control) and group O (negative control).
  - Anti-A,B: group A and group B (positive control) and group O (negative control).
- Test tube centrifuge.
- Validated "U" well microplates.
- Volumetric pipettes.

## RECOMMENDED TECHNIQUES

### A. Tube Technique

- Prepare a 2-3% suspension of test red cells in PBS or Isotonic saline.
- Place in a labelled test tube: 1 volume of Rapid Labs Anti-ABO reagent and 1 volume of test red cell suspension.
- Mix thoroughly and incubate at room temperature for 1 minute.
- Centrifuge all tubes for 10 seconds at 1000 rcf or for a suitable alternative time and force.
- Gently resuspend red cell button and read macroscopically for agglutination
- Any tubes, which show a negative or questionable result, should be incubated for 15 minutes at room temperature.
- Following incubation, repeat steps 4 and 5.

### B. Bio-Rad-ID Micro Typing Technique

- Prepare a 0.8% suspension of red cells in ID-CellStab or ID Diluent 2.
- Remove aluminium foil from as many microtubes as needed.
- Place in appropriate microtube: 50µl of test red cell suspension and 25µl of Rapid Labs Anti-ABO reagent.
- Centrifuge ID-Card(s) in the Bio-Rad gel card centrifuge.
- Read macroscopically for agglutination.

### C. Ortho BioVue Typing Technique

- Prepare a 0.8% suspension of test red cells in 0.8% Ortho Red Cell Diluent.
- Remove aluminium foil from as many reaction chambers as needed.
- Place in appropriate reaction chamber: 50µl of test red cell suspension and 40µl of Rapid Labs Anti-ABO reagent.
- Centrifuge cassette(s) in an Ortho BioVue System Centrifuge.

5. Read macroscopically for agglutination.

**d. Microplate Technique, using "U" wells**

1. Prepare a 2-3% suspension of test red cells in PBS or Isotonic saline.
2. Place in the appropriate well: 1 volume Rapid Labs Anti-ABO reagent and 1 volume test red cell suspension.
3. Mix thoroughly, preferably using a microplate shaker, taking care to avoid cross-well contamination.
4. Incubate at room temperature for 15 minutes (time dependant on user).
5. Centrifuge the microplate for 1 minute at 140 rcf or for a suitable alternative time and force.
6. Resuspend the cell buttons using carefully controlled agitation on a microplate shaker
7. Read macroscopically or with a validated automatic reader.
8. Any weak reactions should be repeated by the tube technique.

**e. Slide Technique**

1. Prepare a 35-45% suspension of test red cells in serum, plasma or PBS or Isotonic saline or use anti-coagulated whole blood (in its own plasma).
2. Place on a labelled glass slide or card tile: 1 volume of Rapid Labs Anti-ABO reagent and 1 volume of test red cell suspension.
3. Using a clean applicator stick, mix reagent and cells over an area of about 20 x 40 mm.
4. Slowly tilt the slide back and forth for 30 seconds, with occasional further mixing during the 1-minute period, maintaining slide at room temperature.
5. Read macroscopically after 1 minute over a diffuse light and do not mistake fibrin strands as agglutination.
6. Any weak reactions should be repeated by tube technique

**INTERPRETATION OF TEST RESULTS**

1. Positive: Agglutination of the test red cells constitutes a positive test result and within accepted limitations of test procedure, indicates the presence of the appropriate ABO antigen on the test red cells.
2. Negative: No agglutination of the test red cells constitutes a negative result and within the accepted limitations of the test procedure, indicates the absence of the appropriate ABO antigen on the test red cells.
3. Discrepancies: If the results obtained with reverse group don't correlate with forward group, further investigation is required.

**STABILITY OF THE REACTIONS**

1. Read all tube and microplate tests straight after centrifugation.
2. Slide tests should be interpreted within one minute to ensure specificity and to avoid the possibility a negative result may be incorrectly interpreted as positive due to drying of the reagent.
3. Caution should be exercised in the interpretation of results of tests performed at temperatures other than those recommended.

**LIMITATIONS**

1. ABO antigens are not fully developed at birth and so weaker reactions may therefore occur with cord or neonatal specimens.
2. When using Monoclonal Anti-A,B, blood specimens of weak A or B subgroups (e.g Ax) may give rise to false negative or weak reactions when tested using slides, microtitre plates or gel cards. It is advisable to re-test weak subgroups using the tube technique.
3. Rapid Labs monoclonal Anti-A and monoclonal Anti-B are not validated to detect Ax and A3 or Bx and B3 antigens respectively and we therefore do not claim reactivity of the monoclonal Anti-A or Anti-B reagent against these weak A and B sub-groups.
4. Stored blood may give weaker reactions than fresh blood.
5. False positive or false negative results may also occur due to:
  - Contamination of test materials
  - Improper storage, cell concentration, incubation time or temperature
  - Improper or excessive centrifugation
  - Deviation from the recommended techniques
  - Cord samples contaminated with Wharton's jelly

**SPECIFIC PERFORMANCE CHARACTERISTICS**

1. Prior to release, each lot of Rapid Labs Monoclonal Anti-A, Anti-B and Anti-A,B is tested by the Recommended test methods listed in this IFU. The tests complied with the test requirements as stated in the current version/issue of the 'Guidelines for the Blood Transfusion Services in the United Kingdom and the 'Common Technical Specification'.
2. Specificity of source monoclonal antibodies is demonstrated using a panel of antigen-negative cells.
3. The potency of the reagents has been tested against the following minimum potency reference standards obtained from National Institute of Biological Standards and Controls (NIBSC): Anti-A reference standard 03/188 And / Or Anti-B reference standard 03/164
4. Rapid Labs Anti-B does not react with "Acquired-B" red cells.
5. Rapid Labs Monoclonal ABO reagents do not detect crypt antigens such as T, Tn or Cad.
6. The Quality Control of the reagents was performed using red cells that with phenotypes that were verified by a UK blood transfusion Centre and had been washed with PBS or Isotonic saline prior to use.

**DISCLAIMER**

1. The user is responsible for the performance of the reagents by any method other than those mentioned in the Recommended Techniques.
2. Any deviations from the Recommended Techniques should be validated prior to use<sup>8</sup>.

**BIBLIOGRAPHY**

1. Marion E. Reid and Christine Lomas-Francis, Blood Group Antigens and Antibodies, SBB Books, New York 2007; Page 181.
2. Issitt PD. Applied Blood Group Serology, 3rd Edition. Montgomery Scientific, Miami 1985; Chapter 6
3. Guidelines for the Blood Transfusion Service in the United Kingdom 6th Edition 2002. The Stationery Office.
4. AABB Technical Manual, 16th Edition, AABB 2008.
5. British Committee for Standards in Haematology, Blood Transfusion Task Force. Recommendations for evaluation, validation and implementation of new techniques for blood grouping, antibody screening and cross matching. Transfusion Medicine, 1995, 5, 145-150.

**AVAILABLE REAGENT SIZES**

	Vial/ Pack Size	Catalogue Number
Anti-A Monoclonal	10 ml 10 X 10 ml	BC-A10 BC-A10X10
Anti-B Monoclonal	10 ml 10 X 10 ml	BC-B10 BC-B10X10
Anti-A,B Monoclonal	10 ml 10 X 10 ml	BC-AB10 BC-AB10X10

**TABLE OF SYMBOLS**



Consult instructions for use



For *in vitro* diagnostic use only



Catalogue Number



Batch/Lot Number



Store at



Expiry Date



Manufacturer



Date of manufacture



Advena Ltd. Tower Business Centre, 2<sup>nd</sup> Flr., Tower Street, Swatar, BKR 4013 Malta



Manufactured by: Rapid Labs Ltd

Unit 2 & 2A Hall Farm Business Centre, Church Road, Little Bentley, Colchester, Essex, CO7 8SD, United Kingdom

Email: [medical@rapidlabs.co.uk](mailto:medical@rapidlabs.co.uk)

Website: [www.rapidlabs.co.uk](http://www.rapidlabs.co.uk)