

Blood Grouping Reagent

Anti-K (KEL1)

Seraclone[®] Human Monoclonal (MS56)

FOR IN-VITRO DIAGNOSTIC USE

For Tube Testing

MEETS FDA POTENCY REQUIREMENTS

U.S. License Number: 1798

Package size

[REF] 808090100 [VOL] 5 mL Seraclone[®] Anti-K (KEL1)

Intended Use

For the determination of the Kell (KEL1) antigen of red blood cells using the tube test.

Summary

The Kell (KEL1) antigen was first identified in 1946 when the corresponding antibody was found to cause hemolytic disease of the fetus and newborn (HDFN). Anti-K antibody has also been shown to cause hemolytic transfusion reactions (HTR). Although in low density on the red cell membrane the Kell antigen is strongly immunogenic¹.

Since the description of the antigen K in 1946 by Coombs *et al* and its allele \bar{K} in 1949 by Levine *et al*, the Kell blood group system has been shown to be increasingly complex and over 20 antigens are now known to be associated with the system. These are probably controlled from a series of closely linked loci so that Kell antigens, like CDE in the Rh system, are inherited as haplotype.

The antigens of the Kell blood group system are of further interest in that they tend to occur either very frequently (eg \bar{k} 99.8%) or relatively infrequently (eg K 8%) and show considerable ethnic variation.

Kell system antibodies are capable of causing hemolytic transfusion reactions (HTR) and hemolytic disease of the fetus and newborn (HDFN) and are optimally detected by the indirect antiglobulin technique¹.

The frequencies of the common phenotypes are shown in the table.

Phenotypes and Frequencies in the Kell System ¹		
Phenotype	Whites	Blacks
K+k-	0.2	Rare
K+k+	8.8	2
K-k+	91.0	98
Kp (a+b-)	Rare	0
Kp (a+b+)	2.3	Rare
Kp (a-b+)	97.7	100
Js (a+b-)	0.0	1
Js (a+b+)	Rare	19
Js (a-b+)	100.0	80
K ₀	Exceedingly rare	

Biotest Anti-K Blood Group Reagent is used to test for the presence or absence of the K antigen. Biotest Anti-K is used principally in the resolution of antibody problems or in family studies.

Principle of the Test

The test principle is hemagglutination. The antibodies in Anti-K (KEL1) bind to the K antigen on red blood cells and cause an antigen-antibody reaction visible as red cell agglutination.

Reagent

As the reactive component Seraclone[®] Anti-K (KEL1) contains a human monoclonal antibody of the immunoglobulin class IgM. It is derived from cell culture supernatant and demonstrates the consistent specificity and reproducibility characteristic for monoclonal antibodies. Antibodies are diluted in a buffered protein solution containing bovine albumine and macromolecular potentiators.

The following antibodies are produced using intermediate products produced for Biotest AG in a shared manufacturing agreement with Millipore (UK) Ltd., 9 Fleming Road, Kirkton Campus, EH547BN, Livingston, UK; License Number 1721.

Seraclone[®] Anti-K (KEL1)

clone MS56 (IgM)

Preservative: 0.1% sodium azide.

Precautions

- For In-vitro diagnostic use.
- Store at 2 to 8°C.
- Do not use beyond the expiration date.
- Do not use if turbid.
- Handle and dispose of reagents as potentially infectious
- Caution: Do not pipette by mouth. The absence of all viruses has not been determined.
- Caution: This product contains Natural Rubber Latex Which May Cause Allergic Reactions.
- Warning: Contains sodium azide (NaN₃), which may react with lead or copper plumbing to form explosive azides. If discarded in the sink, flush with large amounts of water to prevent the build-up of explosive metal azides.
- The bovine albumin used for the production of this reagent is purchased from BSE-free US sources, Boval Company L.P. in Cleburne, Tx, USA and Millipore in Kankakee, IL, USA.

Specimen Collection

Fresh samples of clotted, EDTA or citrate anticoagulated whole blood collected following general blood sampling guidelines are acceptable. The specimen should be tested as soon as possible after collection. If testing is delayed, EDTA and clotted specimens should be stored at 2 to 8°C, citrated specimens (donor segments) at 1 to 6°C.

Blood specimens exhibiting gross hemolysis or contamination should not be used.

Clotted samples or those collected in EDTA may be tested within ten days from collection. Donor blood stored in citrate anticoagulant may be tested until the expiration date of the donor unit.

Materials

Materials provided

- Seraclone[®] Anti-K (KEL1)

Materials required but not provided

- Pipettes (drop volume 40 to 50 µl)
- Isotonic saline solution
- Glass tubes 10 x 75mm or 12 x 75mm
- Serological Centrifuge
- Interval Timer
- Markers
- Optical aid (optional). The use of an optical aid for agglutination reading must be validated by the user.

Test Procedure

Tube test

1. Prepare a 3 to 5% suspension of red blood cells to be tested in isotonic saline.
2. Place one drop reagent into an appropriately labeled tube.
3. Add one drop of red blood cell suspension into the tube and mix.
4. Incubate at room temperature (20 to 24°C) for 5 minutes.
5. Centrifuge for 20 seconds at 800 -1000 x g.
6. Gently dislodge red blood cell button and observe for agglutination.
7. Record results

Stability of the Reaction

Following centrifugation, all tube tests should be read immediately and results interpreted without delay. Time delays may cause a dissociation of the antigen-antibody complexes resulting to false negative or more often weak positive reactions.

Quality Control

The reactivity of all blood typing reagents should be confirmed by testing with known positive and negative red blood cells on each day of use.

To confirm the reactivity or specificity of Biotest Monoclonal Anti-K Blood Grouping Reagent, it should be tested with antigen-positive (preferably from heterozygous individuals) and antigen-negative red blood cells, respectively. The reagent is satisfactory for use if it reacts only with antigen-positive red blood cells.

It is recommended that a positive and a negative control be performed in parallel with testing.

Interpretation of results

Agglutination of the red blood cells is a positive result and indicates the presence of the corresponding antigen. No agglutination is a negative result and indicates the absence of the corresponding antigen.

Antigen Frequency (%) ²					
	Caucasian	Blacks	Orientals	Iranian Jews	Arabs
K	9	2	Rare	12	as high as 25%

An agglutination viewer may facilitate the reading of tube tests (as recommended by the AABB Technical Manual, 15th edition).

Limitations

- Samples with a positive direct antiglobulin test, cold agglutinins, or rouleaux formation may show false positive results in testing with monoclonal antibodies. Results on these samples must be interpreted with caution. False positive results or reaction suspected to be due to cold agglutinins should be resolved according to in-house procedures. It is recommended that an appropriate control be tested in parallel.
- Kell antigen expression may be dramatically weakened in some cases of Chronic Granulomatous Disease.
- Stored red blood cells may exhibit weaker reactions.
- Some conditions that may cause false positive results are:
 - Contamination of sample or reagents
 - Autoantibodies
 - Improper storage or preparation of cells
 - Antibodies to antibiotics or other reagents
 - Cold Antibodies

Specific Performance Characteristics

Testing is performed in accordance with FDA recommended methods. The final release testing is performed according to the product specific SOPs. Each lot of Biotest Blood Group Reagent is tested in the Quality control by package insert method against a panel of antigen positive red blood cells (heterozygous antigen expression and if possible weakened antigen expression) to insure suitable reactivity. The products meet FDA potency requirements. The specificity testing for the presence of contaminating antibodies is performed according to the product specific SOPs.

For the product performance it is necessary to adhere to the recommended method in the instructions for use.

The performance of the Biotest Anti-K was confirmed against a FDA approved reference reagent in a Multi Center Field Trial.

For Technical Support or further product information, contact Biotest Diagnostics Corporation at 800-522-0090.

Note

Each facility should verify the optimum spin time for the specific centrifuge in use.

Manual techniques are to be performed according to the manufacturer's instructions. Each deviation from these instructions is the sole responsibility of the user.

Used tests must be discarded as hazardous material. Manage waste according to local, state and national regulations.

Glossary of Symbols

Symbol	Definition	Symbol	Definition
	Batch Code		<i>In vitro</i> diagnostic medical device
	Caution, consult accompanying documents		Consult instructions for use.
	Manufacturer		Use by YYYY-MM-DD
	Contains sufficient quantity for <n> tests.		Catalog number
	Temperature limitation		Volume

Bibliography

1. Mark E. Brecher, MD et al. Technical Manual 15th Edition, Bethesda, MA: AABB, 2005.
2. Marion E. Reid, Christine Lomas-Francis, The Blood Group Antigen FactsBook, New York, NY: Academic Press, 2004.