

INSTRUCTIONS FOR USE

IntelliFlow™

Leukocyte Stabilization Tube

Product Name	Leukocyte Stabilization Tube
Catalog Number	ZK202604
Package Size	50 tubes per pack
Regulatory Status	FOR VETERINARY USE ONLY.

FOR VETERINARY USE ONLY.

1. INTENDED USE

The Leukocyte Stabilization Tube is a vacuum blood collection tube containing a proprietary leukocyte stabilization solution and the anticoagulant K2EDTA. It is designed to preserve leukocyte surface antigen integrity in veterinary whole blood samples for up to 22 days: room temperature (72–82°F / 22–28°C) for Days 1–7, then refrigerated (36–46°F / 2–8°C) through Day 22.

The tube is intended for use as a sample stabilization container for downstream multi-color flow cytometric analysis of lymphocyte immunophenotypes in veterinary species, including T cells, B cells, and NK cells in veterinary applications.

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2. PRINCIPLE OF THE PROCEDURE

Conventional EDTA-anticoagulated blood specimens must be processed within 48 hours of collection, making remote sample collection and batched laboratory analysis difficult. Under standard EDTA storage conditions at 72–82°F (22–28°C) or 36–46°F (2–8°C), leukocyte surface antigen expression degrades progressively, compromising the accuracy of immunophenotyping results.

The Leukocyte Stabilization Tube contains a proprietary stabilization solution that stabilizes leukocyte surface antigens following blood collection into the tube. Leukocyte surface antigens including CD3, CD4, CD8, CD19, and CD16/CD56 remain stable for up to 22 days under the specified storage conditions.

Preserved samples can subsequently be analyzed using standard flow cytometry protocols on any commercially available flow cytometer, with antibodies from any major vendor.

REAGENTS

Each Leukocyte Stabilization Tube contains the anticoagulant K2EDTA and a proprietary leukocyte stabilization solution (20 µL pre-filled). At a 1:100 stabilization solution-to-blood ratio, each tube is calibrated to receive 2 mL of whole blood. The stabilization solution is supplied ready to use. Do not dilute or add other components to the tube.

3. MATERIALS PROVIDED

Each package contains:

- Leukocyte Stabilization Tubes (standard vacuum blood collection tube format)
- Instructions for Use

Tube specifications:

- Format: Standard vacuum blood collection tube
- Material: Laboratory-grade glass
- Closure: Orange
- Additive: K2EDTA anticoagulant and proprietary leukocyte stabilization solution (20 µL pre-filled)
- Vacuum: Calibrated for direct venipuncture draw of 2 mL (blood-to-stabilization solution ratio 1:100)
- Draw volume: 2 mL
- Label: Product identification, lot number, expiration date
- Outer diameter: 8 ±0.5 mm
- Length: 75 ±2.0 mm

4. MATERIALS REQUIRED BUT NOT PROVIDED

- Standard EDTA anticoagulant blood collection tubes (optional, for comparison or backup collection)
- Standard flow cytometry reagents and antibodies (compatible with major vendors including BD Biosciences and Beckman Coulter)
- Flow cytometer (any commercially available instrument)

5. STORAGE AND STABILITY

Unopened product (before use):

- Store at room temperature (59–86°F / 15–30°C)
- Shelf life: 24 months from date of manufacture
- Do not freeze
- Protect from direct sunlight
- Use before the expiration date printed on the label

After sample collection:

- Store at room temperature (72–82°F / 22–28°C) for Days 1–7, then transfer to refrigerated storage (36–46°F / 2–8°C) through Day 22
- Samples remain stable for up to 22 days under specified storage conditions
- No cold chain required for shipping
- Do not freeze samples after transfer

INDICATIONS OF PRODUCT DETERIORATION

Do not use the Leukocyte Stabilization Tube if any of the following are observed in an unfilled tube:

1. Cloudiness or visible precipitate in the stabilization solution.
2. Discoloration of the stabilization solution.
3. Loss of vacuum (tube fails to draw blood or draws significantly less than the stated volume).
4. Visible cracks, chips, or damage to the glass tube.

If any indication of product deterioration is observed, do not use the tube. Contact IntelliFlow Tech LLC Technical Support at intelliflowtech@gmail.com or 1-818-278-9388.

FREEZING AND THAWING

Blood samples in the Leukocyte Stabilization Tube:

5. Do not freeze whole blood samples stored in the Leukocyte Stabilization Tube. Freezing will cause hemolysis and compromise sample integrity.
6. If downstream analysis requires frozen plasma, centrifuge the blood sample first to obtain plasma, then transfer the plasma fraction to a separate labeled cryogenic tube prior to freezing.
7. Plasma may be stored frozen at –4°F (–20°C) or –112°F (–80°C) for long-term storage. Thaw at 36–46°F (2–8°C) and mix gently before use. Follow the downstream assay manufacturer's instructions for processing.

6. SPECIMEN COLLECTION AND HANDLING

Step 1 — Blood Collection

Draw blood directly into the Leukocyte Stabilization Tube via standard veterinary venipuncture. Allow the vacuum to draw exactly 2 mL of blood into the tube until filling stops. Do not overfill.

Step 2 — Mixing

Immediately after collection, gently invert the Leukocyte Stabilization Tube 5 to 10 times to ensure thorough mixing of the blood with the stabilization solution. Do not shake.

Step 3 — Storage

Store the Leukocyte Stabilization Tube at room temperature (72–82°F / 22–28°C) for Days 1–7, then transfer to refrigerated storage (36–46°F / 2–8°C) through Day 22. Samples remain stable for up to 22 days under these specified conditions.

Step 4 — Analysis

At any point within the 22-day stability window, process the stored sample according to standard flow cytometry protocols for lymphocyte immunophenotyping. No special pretreatment is required beyond standard sample preparation steps.

7. PERFORMANCE CHARACTERISTICS

Stability of Lymphocyte Subset Markers in the Leukocyte Stabilization Tube (representative data from human blood; users should validate for their specific animal species)

Lymphocyte subset percentages were measured in blood from healthy donors collected directly into Leukocyte Stabilization Tubes and stored under the specified two-phase conditions. Key markers were assessed at Day 1, Day 3, Day 5, Day 7, and Day 22.

Time Point	Day 7 — 72–82°F (22–28°C) (% lymphocytes)	Day 22 — 36–46°F (2–8°C) (% lymphocytes)
CD3+	71.25%	71.41%
CD3+CD4+	36.85%	35.18%
CD3+CD8+	30.21%	32.03%
CD3-CD19+	16.58%	17.00%
CD3-CD(16+56)+	12.06%	11.28%

Standard deviation across all time points: < 1.0%

Comparison to standard EDTA tubes (same donors, identical conditions):

Time Point	Standard EDTA 72–82°F (22–28°C)	Standard EDTA 36–46°F (2–8°C)
CD3+	72.14%	71.41%
CD3+CD4+	36.75%	35.18%
CD3+CD8+	31.43%	32.03%
CD3-CD19+	17.77%	17.00%
CD3-CD(16+56)+	8.36%	11.28%

In standard EDTA tubes, CD3-CD(16+56)+ NK cell percentages dropped from 12.53% at Day 1

to 8.36% by Day 7, and other subsets showed progressive drift. In the Leukocyte Stabilization Tube, all lymphocyte subset percentages remained stable through Day 22 under the specified two-phase storage conditions, with all subsets maintaining SD < 1.0% across the stability window.

Compatibility

The Leukocyte Stabilization Tube is a standardized product with one specification. It has been validated for use with flow cytometry reagents from major vendors including BD Biosciences and Beckman Coulter. It is compatible with all commercially available flow cytometers following standard sample preparation protocols. No vendor-specific customization or protocol modification is required.

8. LIMITATIONS

- This product is FOR VETERINARY USE ONLY.
- Performance data has been established using human whole blood samples. Users are encouraged to validate performance in their specific animal species prior to use.
- The product is designed to preserve leukocyte surface antigen integrity for multi-color immunophenotyping of lymphocyte subsets (CD3, CD4, CD8, CD19, CD16/CD56). Performance for other surface markers not listed should be validated by the user prior to use.
- For optimal results, blood should be drawn directly into the Leukocyte Stabilization Tube using standard veterinary venipuncture technique.
- Overfilling or underfilling will result in an incorrect blood-to-additive ratio and may lead to suboptimal product performance. The vacuum is calibrated to draw exactly 2 mL.
- Do not reuse the tube or its contents.

9. WARNINGS AND PRECAUTIONS

8. FOR VETERINARY USE ONLY.
9. Do not use tubes past the expiration date printed on the label.
10. Do not draw blood into the Leukocyte Stabilization Tube past the expiration date. If sample collection occurs on or before the expiration date, samples should be processed within the stated stability window.
11. Do not use tubes for collection of materials to be injected into animals.
12. Product is intended for use as supplied. Do not dilute or add other components to the tube.
13. Overfilling or underfilling of tubes will result in an incorrect blood-to-additive ratio and may lead to suboptimal product performance.
14. Store as directed. Improper storage may affect product performance.
15. Treat all blood samples as potentially biohazardous. Follow universal precautions and institutional biosafety guidelines.
16. Use personal protective equipment (gloves, lab coat, eye protection) during sample

handling.

17. Dispose of used tubes and associated materials as biohazardous waste in accordance with local, state, and federal regulations.
18. Do not use if the tube is damaged, cracked, or has lost its vacuum.

CAUTION — GLASS TUBE HANDLING

- a. Glass has the potential for breakage. Precautionary measures should be taken during all handling, transport, and storage of glass tubes.
- b. All biological specimens and materials coming into contact with them should be treated as potentially biohazardous and capable of transmitting infection. Dispose of in accordance with applicable federal, state, and local regulations. Avoid contact with skin and mucous membranes.
- c. Used tubes and associated materials should be disposed of as infectious medical waste.
- d. To remove the stopper, gently rock it from side to side, or grasp with a simultaneous twisting and pulling action. A thumb-roll procedure for stopper removal is NOT recommended as tube breakage and injury may result.
- e. Safety Data Sheet (SDS) can be obtained by contacting IntelliFlow Tech LLC at intelliflowtech@gmail.com or 1-818-278-9388.

10. DISPOSAL

Used tubes containing blood samples should be disposed of as biohazardous waste in accordance with local, state, and federal regulations.

11. REGULATORY STATUS

- United States: FOR VETERINARY USE ONLY.

REFERENCES

#	Reference
1	Cian F, Guzera M, Frost S, Van Poucke S, Comazzi S, Archer J. Stability of immunophenotypic lymphoid markers in fixed canine peripheral blood for flow cytometric analysis. <i>Vet Clin Pathol</i> . 2014;43(1):101–108. doi: 10.1111/vcp.12111.
2	Zwicklbauer K, von la Roche D, Krentz D, Kolberg L, Alberer M, Zablotski Y, Hartmann K, von Both U, Härtle S. Adapting the SMART tube technology for flow cytometry in feline full blood samples. <i>Front Vet Sci</i> . 2024;11:1377414. doi: 10.3389/fvets.2024.1377414.
3	Meier L, Carlson R, Neßler J, Tipold A. Stability of canine and feline cerebrospinal fluid samples regarding total cell count and cell populations stored in TransFix/EDTA CSF

	sample storage tubes. BMC Vet Res. 2020;16:487. doi: 10.1186/s12917-020-02698-5.
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12. SYMBOLS USED ON LABELING

Symbol	Meaning
REF	Catalog number
LOT	Batch code
Hourglass icon	Use by date (expiration)
Factory icon	Manufacturer
Thermometer icon	Storage temperature range
VET	FOR VETERINARY USE ONLY.

ORDERING INFORMATION

Field	Information
Distributor	IntelliFlow Tech LLC
Address	16192 Coastal Highway, Lewes, DE 19958, United States
Email	intelliflowtech@gmail.com
Phone	1-818-278-9388
Catalog Number	ZK202604
Package Size	50 tubes per pack

13. MANUFACTURER AND DISTRIBUTOR INFORMATION

Manufactured in China by:

Jiangsu Maik Medical Apparatus Co Ltd
No 59, JiangShen Road, Jiangyan District, Taizhou City, China 225500

Distributed in the United States by:

IntelliFlow Tech LLC
16192 Coastal Highway, Lewes, DE 19958, United States
Email: intelliflowtech@gmail.com
Tel: 1-818-278-9388 / 1-984-528-9102
Website: www.intelliflowtech.com

14. DOCUMENT INFORMATION

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IntelliFlow Tech LLC | Lewes, DE, USA | intelliflowtech@gmail.com | IFT-IFU-LST-VET-001
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