PURDUE UNIVERSITY | Animal Disease Diagnostic Laboratory

Hemolysis in blood specimens

Hemolysis is the breaking down of red blood cells due to the mishandling of blood samples during routine blood collection and transport.

Serum from heavily hemolyzed blood specimens can interfere with the antigen-antibody reaction and color measurement in the ELISAs and other immunoassays.

The accuracy of the test results is dependent on the quality of the specimens. A quality serum for diagnostic testing can be obtained by following best practices during collection, handling, and transporting the samples to the diagnostic laboratory.

Best Practices to Prevent Hemolysis

Collection and Handling

1. Choose the right gauge needle.
2. Alcohol used for cleansing the venipuncture site should be allowed to dry completely before drawing the blood.
3. One should collect the blood specimen in the correct blood collection tube (serum separator tube (SST) (Tiger top tubes) or red top tubes without anticoagulants).
4. After performing venipuncture and removing the needle, transfer the blood gently down the side of the collection tube.
5. Invert the tube gently as recommended by the tube manufacturer.
6. Later, the tube should be placed upright for 15-30 minutes at room temperature until complete clot formation.
7. Once clotted, store the samples at an upright position at 4°C (refrigerated) until ready to be shipped to the lab or spun down and serum poured off into a clean labeled sterile tube prior to sending. Avoid freeze-thaw cycles. The best sample for testing would be serum only.

Packaging for the shipment

1. Proper packaging using sufficient foam to prevent specimen immobilization during the shipment.
2. Ship the samples with a cold pack and in an insulated container for overnight delivery.

For more information on the shipment, please refer to:

1. https://vet.purdue.edu/addl/news/files/documents/Shipping%20Diagnostic%20Specimens%20in%20Extreme%20Heat2.pdf
2. https://vet.purdue.edu/addl/news/files/documents/ADDL%20Shipping%20Diagnostic%20Specimens%20in%20Extreme%20Cold.pdf

COLLEGE OF VETERINARY MEDICINE
Animal Disease Diagnostic Laboratory
406 South University Street, West Lafayette, IN 47907-2065
Office: 765-494-7440 Fax : 765-494-9181

Hemolysis Reference Palette guide
https://www.cdc.gov/ncezid/dvbd/pdf/Hemolysis_Palette_Bookmark-P.pdf

References

1. https://pubmed.ncbi.nlm.nih.gov/22015139/
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1904417/
3. https://journals.sagepub.com/doi/pdf/10.1177/000456329903600603
4. https://vetnurse.com.au/2018/03/07/jugular-venepuncture/
5. https://www.cdc.gov/ncezid/dvbd/stories/research-lab-diagnostics/hemolysis-palette.html
6. https://apps.who.int/iris/bitstream/handle/10665/265566/PMC2538031.pdf?sequence=1
7. https://www.cdc.gov/ncezid/dvbd/stories/research-lab-diagnostics/hemolysis-palette.html
8. https://www.thermofisher.com/us/en/home/references/protocols/cell-and-tissue-analysis/elisa-protocol/elisa-sample-preparation-protocols/plasma-and-serum-preparation.html