IDEXX Laboratories Pty Ltd
ABN 31 063 154 352
www.idexx.com.au
Toll Free: 1300 4 IDEXX

Technical Bulletin - Haemolysis

A sample that is affected by haemolysis can be inaccurate and unreliable.

Reducing the frequency of haemolysis will not only improve the quality of your results but also avoid the need for retaking blood samples.

What is haemolysis?

Haemolysis is the rupturing of erythrocytes (red cells) in the sample. The rupturing results in the red cell content leaking into the serum or plasma, affecting many of the chemistry and haematology results.

Haemolysis can occur *in vivo* (in the animal) due to a medical condition or *in vitro* (in the collection tube) due to sampling techniques, transport and storage. It is more likely to occur when there is also lipaemia of the sample.

What impact does it have on results?

The effect of haemolysis is variable and unpredictable on some analytes. While some changes are consistent, for example, CK and AST will usually increase with haemolysis and ALP, ALT will decrease, other analytes will vary.

The effect of haemolysis can also be to reduce high results into the normal range and a profile that has no results outside of the reference intervals can still be unreliable.

It is not recommended that you rely solely on textbooks, as all assays are different and changes in one assay type are not necessarily the same as those in another assay. Your Pathologists will guide you on the effects of haemolysis.

How can I prevent haemolysis in biochemistry samples?

There are many causes of sample haemolysis and ensuring your team are well trained on the causes will help reduce incidence of *in vitro* haemolysis and improve the quality of your sample results.

- Fast the patient to reduce lipaemia, which leads to fragile RBCs and lysis in vitro
- Aim for calm, smooth and swift blood collection from the largest vein appropriate for the patient.
- Use the largest needle appropriate for the vein (ideally no less than 21 or 23 g).
- Minimise patient excitement; note any treatment or sedation on the submission form.
- Avoid excessive probing or suction wherever possible
    - Use vacutainer collection system if appropriate but note the order of fill is critical.
- If using alcohol on site preparation, ensure skin is dry before drawing sample
- Keep EDTA samples and clotted/separated serum samples cool in the fridge or near (but not touching) ice packs.

** With hot weather haemolysis is more likely and it is recommended to use gel separator tubes for serum biochemistry samples.

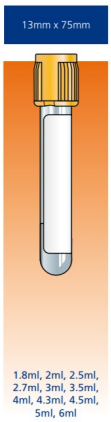
IDEXX Laboratories Pty Ltd
ABN 31 063 154 352
www.idexx.com.au
Toll Free: 1300 4 IDEXX

Order of fill recommendations from syringe:

1. Citrate (if coagulation testing required)
2. EDTA (or Lithium heparin for tiny patients/exotics)
3. Serum gel or plain tube
4. FlOx tube (don't fill glucose tubes at the expense of biochemistry tubes!)

Vacutainer systems mixing recommendations:

Serum - BD SST™ II *Advance* tubes should be gently inverted 180° and back 5 – 6 times, once mixed sample should be left to stand for 30 minutes to clot, before spinning.
The gel forms a barrier between RBCs and serum and prevents any haemolysis affecting the chemistry
EDTA tubes should be gently inverted 180° and back 8 – 10 times.
Blood smears should be made from EDTA blood and air dried, kept at room temperature; the EDTA tube should be placed in fridge before collection or sending.



Centrifugation Instructions:
BD SST™ II *Advance* tubes – 1300 – 2000g for 10 minutes at <25°C room temperature

For haematology, it is always best to provide a fresh blood film with your submission.

Good sample collection and prompt processing reduces the majority of sample issues. Your assistance is greatly appreciated and will ensure better result quality.

Order of fill recommendations for BD Vacutainer®:

1. Citrate Tube
2. BD Vacutainer® SST™ Tube
3. Serum Tube (glass or plastic)
4. Heparin tube
5. EDTA Tube
6. FlOx Tube (don't fill glucose tubes at the expense of biochemistry tubes!)

Serum gel separator tubes must not be used for Progesterone and therapeutic drug testing