Universität Zürich[UZH]

Veterinärmedizinisches Labor

Universität Zürich
Winterthurerstrasse 260
CH-8057 Zürich
Telefon +41 44 635 83 40
Telefax +41 44 635 89 06
www.vetlabor.uzh.ch

April, 2018

Analysis of blood samples from laboratory animals

Shipment Address	Veterinärmedizinisches Labor Winterthurerstr. 260 8057 Zürich
Phone	044 635 83 40
Sample Submission	Main building 2nd floor Room TFA 10.08 
Sample Number	**Maximum of 15 samples per day.** In case of more samples, please contact us.
Notification	The laboratory should be notified at least 7 days before sample submission.
Sample Processing	If samples are received in the laboratory before 2 pm, they will be analyzed the same day (only valid if the laboratory has been notified in advance). This may not be true if manual differentials are required.
Attention	Please be aware that if the laboratory has not been informed about sample submission or if the maximum number of samples is exceeded, we are not able to guarantee sample processing the same day.

ACCREDITED BY EAEVE/FVE

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General remarks

- For blood collection techniques we refer to the Zurich Integrative Rodent Physiology Platform (http://www.zirp.uzh.ch).
- Please use only the indicated blood tubes.
- The tubes have to be clean and clearly labelled.
- For every animal, a submission form has to be filled in and given to the laboratory together with the samples (http://www.vetlabor.uzh.ch). In case of a group of animals with the same analyses, one submission form for the whole group is sufficient.
- For analyses not mentioned below, please contact us: 044 635 83 40 or info@vetlabor.ch
- Please be aware that we don't have any laboratory specific reference values for laboratory animals and that we don't report any reference values in these species.
- Please be aware that, depending on the type of study, an administrative charge might be claimed.

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Hematology

In general, hematology testing is performed on EDTA-anticoagulated blood. This is the only type of anticoagulant that can be assayed with our hematology analyzer. We use a Sysmex XT-2000iV analyzer in our laboratory, which is running with a veterinary specific software able to measure laboratory animals, including mice, rats, monkeys, rabbits, hamsters, minipigs and others. If required, microscopic examination is done by experienced medical technologists and veterinary clinical pathologists are available for consultation.

General remarks

- The sample **stability** is limited and samples have to be analyzed the **day of sampling**. For **mice**, samples should ideally even be analyzed **within 4 hours** after sampling.
- EDTA blood should be kept refrigerated until submission (2-8°C). If you submit the samples on a cold pack, please make sure to keep them out of direct contact with the pack (insert paper towels between the blood and the icepack). Direct contact may cause freezing of red cells, with subsequent hemolysis.
- Clotted samples will yield erroneous results and no results will be released by the laboratory, no matter how big the clots are. Ensure that the blood is mixed promptly with the EDTA after blood collection to avoid sample clotting. This should be done by gentle inversion several times. **Do not shake the tube!** In addition, coating the needle and syringe with a solution of 7.5% EDTA may help to avoid clotting.
- Please be aware that partially filled EDTA tubes affect the cells because EDTA is hypertonic and may result in erroneous results. EDTA tubes should ideally be more than half full.
- Please use tubes with a round bottom inner tube (see recommendations below)

Sample requirements

- Normal aspiration mode:
    - EDTA-anticoagulated whole blood: **at least 300 µl**
    - Recommended tubes: Sarstedt, Microvette® 500 K3E (Ordering Number 20.1341)
- Capillary aspiration mode (blood is diluted 1:5 before analyses (**done by our laboratory**)):
    - EDTA-anticoagulated whole blood: **at least 100 µl**
    - Recommended tubes: Sarstedt, Microvette® 200 K3E (Ordering Number 20.1288)
    - Reticulocyte counts and white blood cell differentials are not as reliable as with the normal aspiration mode; these results will however be verified by microscopic examination of the blood film

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Parameters:

Small hematogram	**Large hematogram**
Hematocrit / Packed cell volume	Hematocrit / Packed cell volume
Hemoglobin concentration	Hemoglobin concentration
Red blood cell count	Red blood cell count
Mean corpuscular hemoglobin (MCH)	Mean corpuscular hemoglobin (MCH)
Mean corpuscular hemoglobin concentration (MCHC)	Mean corpuscular hemoglobin concentration (MCHC)
Mean cellular volume (MCV)	Mean cellular volume (MCV)
Red cell distribution width (RDW)	Red cell distribution width (RDW)
White blood cell count	White blood cell count
Platelet count (Impedance)	White blood cell differential
	Platelet count (Impedance)
	Morphological assessment of all cell lineages*

Remarks:

- Reticulocyte counts need to be requested separately on the submission form and are not part of the large hematogram.
- *Morphological assessment of all cell lineages: based on scattergrams, the need for blood film review and morphological assessment will be determined by a clinical pathologist. Please indicate on the submission form, if you have any specific concerns, which may require blood film review.

Prizes:

- Small hematogram: 16 CHF per sample (excl. of VAT)
- Large hematogram: 34.20 CHF per sample (excl. of VAT)
- Reticulocyte count: 14.00 CHF per sample (excl. of VAT)
- Platelets are routinely counted by impedance technology; if an optical count is required, 12.00 CHF per sample (excl. of VAT) needs to be charged in addition.

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Bone Marrow:

We are able to examine and interpret bone marrow smears. This will be done by veterinary clinical pathologists (Dipl. ECVCP) experienced in laboratory animal species. Please get in contact with us for details.

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Coagulation

Coagulation testing is performed on citrated plasma. We use a Stago Start 4 coagulation analyzer applying an electro-mechanical clot detection method. This method is widely used and suitable for laboratory animals.

General remarks:

- The citrate to whole blood ratio is critical (anticoagulant:blood = 1:9), since over- or undercitrated samples will yield erroneous coagulation results. Therefore, **tubes need to be exactly filled until the mark.**
- Before centrifugation of blood, absence of clots has to be confirmed. Clotted samples will yield erroneous coagulation results.
- Centrifugation should be done within **one hour** of blood collection. Plasma should then immediately be frozen at -20°C and submitted frozen to the laboratory for analysis.
- Centrifugation: 10 minutes at 1.800 x g; plasma should be pipetted in a clean, dry, well closing tube without anticoagulant.

Sample requirements:

- **Citrated plasma** (submitted frozen):
    - Prothrombin time (PT): **at least 100 µl**
    - Activated partial thromboplastin time (aPTT): **at least 100 µl**
    - Thrombin time (TT): **at least 200 µl**
    - Fibrinogen: **at least 30 µl**
- Recommended tubes:
    - Sarstedt Probengefäss 1,3ml 9NC, Ordering Number: 41.1350.005 OR
    - Sarstedt Probengefäß 1ml 9NC, Ordering Number: 41.1506
    - Sarstedt Probengefäß 0.5ml 9NC, Ordering Number: 41.1506.002

Parameters:

- Prothrombin time (PT)
- Activated partial thromboplastin time (aPTT)
- Thrombin time (TT)
- Fibrinogen

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Prizes:

- Prothrombin time: 12.50 CHF per sample (excl. of VAT)
- Activated partial thromboplastin time: 12.50 CHF per sample (excl. of VAT)
- Thrombin time: 12.50 CHF per sample (excl. of VAT)
- Fibrinogen: 15 CHF per sample (excl. of VAT)

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Clinical Chemistry

Serum or heparinized plasma samples are used for clinical chemistry analyses. We use a Roche Integra 800 analyzer in our laboratory applying photometry and ion-selective electrode potentiometry technologies. This analyzer and these technologies are suitable for laboratory animal species.

General remarks:

- Submission of whole blood should be avoided, to minimize artifacts that occur with storage.
- For serum preparation, whole blood is drawn in a clean, dry tube without anticoagulant, left at room temperature for 30 min to allow clotting and followed by centrifugation.
- For plasma preparation, whole blood is drawn in Heparin tubes (see below) followed by centrifugation. Centrifugation can be done immediately after blood sampling.
- Centrifugation: 10 minutes at 2.000 x g; plasma/serum should be pipetted in a clean, dry, well closing tube without anticoagulant.
- If samples are shipped overnight, they should be kept cool (shipped on ice packs) and in the dark. If samples are not submitted to the laboratory at the day of sampling, freezing at -20°C is recommended.

Sample requirements:

- Serum or heparin plasma: **at least 350 µl** for the chemogram (see below); please get in contact regarding sample volume if individual parameters are needed only.
- Recommended tubes for Heparin-Plasma: Sarstedt, Microvette® 300LH; Ordering Number: 20.1309

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Parameters:

Chemogram*	**Individual parameters**
Aspartate aminotransferase (AST)	Glutamate dehydrogenase (GLDH)
Alanine aminotransferase (ALT)	Gamma-glutamyltransferase (GGT)
Alkaline phosphatase (ALP)	Sorbitol dehydrogenase (SDH)
Creatine kinase	Lactate dehydrogenase (LDH)
Total bilirubin	Lipase
Total protein	Iron
Albumin	Ammonium**
Glucose	Bile acids
Urea	Fructosamine
Creatinine	Serum Amyloid A (SAA)***
Cholesterol	C-reactive protein (CRP)***
Triglycerides	
Sodium	
Potassium	
Chloride	
Total calcium	
Phosphorus	
Total magnesium	

*Please note that all parameters included in the chemogram profile may also be requested individually.
** Please contact the laboratory before sampling, since special sample requirements are needed.
*** Species-specific parameters, please get in contact for detailed information

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Prizes:

- Chemogram: 63 CHF per sample (excl. of VAT)
- Individual parameters (including those mentioned in the chemogram):5 CHF per parameter and sample (excl. of VAT), except for:
    - Ammonium: 24 CHF per sample (excl. of VAT)
    - Bile acids: 23 CHF per sample (excl. of VAT)
    - Fructosamine: 15 CHF per sample (excl. of VAT)
    - Serum Amyloid A: 30 CHF per sample (excl. of VAT)
    - C-reactive protein: 22 CHF per sample (excl. of VAT)

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Interpretation of results

Interpretation of results and preparation of a report is possible at extra costs. This will be done by a veterinary clinical pathologist (Dipl. ECVCP) experienced in interpretation of preclinical toxicology studies. For a cost estimate, please get in contact with us with study details.