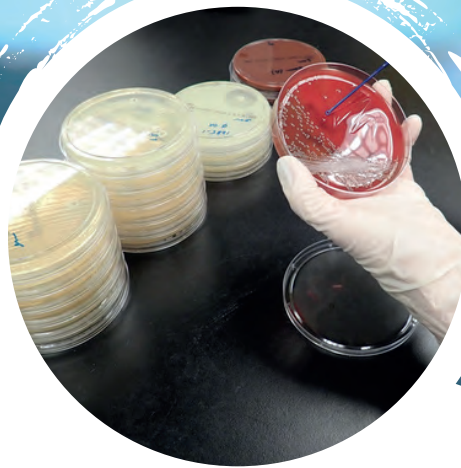


# CITYU VETERINARY DIAGNOSTIC LABORATORY

Service List 2024



香港城市大學  
City University of Hong Kong



VETERINARY  
DIAGNOSTIC  
LABORATORY

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## Courier Services

To book a sample pickup please submit the Specimen Collection Order Form via <https://alt.jotfor.ms/212520971760049> or contact our courier service provider **Lalamove** at 9220-5494.

Clinics and institutions are also welcome to deliver specimens to CityU VDL during our opening hours. For more details, please call **3442-4849** or email us at [info@cityuvdl.com.hk](mailto:info@cityuvdl.com.hk).

## Opening Hours

Monday to Friday: 9am – 7pm  
Saturday: 9am – 5:30pm  
Sunday: 2pm – 5:30pm  
Public Holiday: Closed

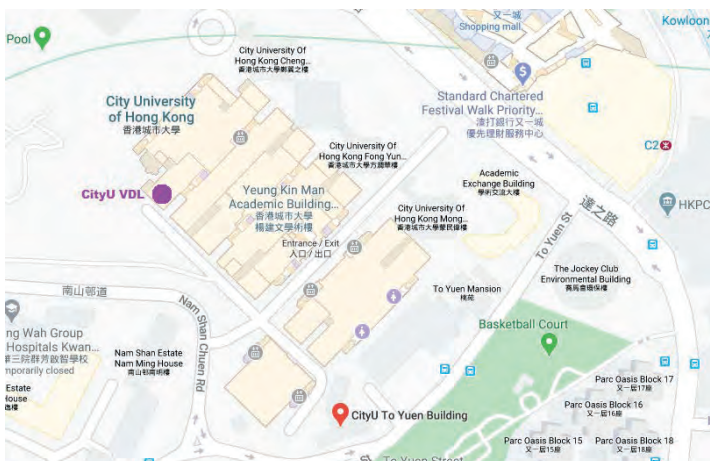
## Contact details

Phone: (852) 3442-4849  
*(for case enquiry, consumable purchase, submission forms, pricelist)*  
Fax: (852) 3442-0819  
Email: [info@cityuvdl.com.hk](mailto:info@cityuvdl.com.hk)  
Website: <https://www.cityuvdl.com.hk>  
LinkedIn: <https://www.linkedin.com/company/cityuvdl>

## Address

Y1710, 1/F, Yellow Zone  
Yeung Kin Man Academic Building  
City University of Hong Kong  
83 Tat Chee Avenue  
Kowloon, Hong Kong

(It is advised to come in from the entrance on Nam Shan Chuen Road)



# Veterinary Pathologists



**Dr. Fraser Hill**, Director, Veterinary Anatomic Pathologist, Adjunct Professor  
*BVSc (dist), MANZCVS (Sheep Medicine, Pathology), FANZCVS (Anatomic Pathology)*

*Registered Specialist Veterinary Anatomic Pathologist*

Adjunct Professor Fraser Hill is recognised as a specialist in veterinary pathology in Hong Kong, Australia and New Zealand. He is a member of the Australia and New Zealand College of Veterinary Scientists in Sheep Medicine and Pathology as well as a fellow of the Australia and New Zealand College of Veterinary Scientists in Anatomic Pathology.



**Prof. May Tse**, Veterinary Anatomic Pathologist  
*BVM&S, MRCVS, Dip ACVP (Anatomic Pathology)*

*Registered Specialist Veterinary Anatomic Pathologist*

Dr. May Tse studied veterinary science at the University of Edinburgh and completed her anatomic pathology residency at Cornell University (in conjunction with City University) before successfully completing the board examinations in 2018. She is currently a clinical assistant professor at the City University's Jockey Club College of Veterinary Medicine and Life Sciences. Working two days per week on the anatomic pathology roster, Dr. Tse enjoys all aspects of diagnostic pathology but has a particular interest in neoplasia.



**Dr. Andrew Ferguson**, Veterinary Pathologist  
*BVSc, GCVSt (Diag Path) MANZCVS (Pathobiology)*

Dr. Andrew Ferguson has extensive experience working in veterinary diagnostic laboratories within government, research and commercial settings across several countries. He has worked for various offices of WHO and OIE, and has also consulted for FAO in both technical and management roles, promoting collaborative approaches in the fields of laboratory, diagnostic testing, and zoonotic disease.



**Prof. Jeanine Sandy**, Veterinary Anatomic Pathologist and Clinical Pathologist  
*BVSc, MANZCVS, PhD, Dip ACVP (Anatomic Pathology and Clinical Pathology)*

*Registered Specialist Veterinary Anatomic Pathology*

Dr. Jeanine Sandy is an associate professor for veterinary pathology at the City University's Jockey Club College of Veterinary Medicine and Life Sciences. She obtained her American Board qualifications as an anatomic pathologist in 2010 and as a clinical pathologist in 2021. Working two days per week on the anatomic and clinical pathology roster, Dr. Sandy's special areas of interests include liver, bone, skin and clinical pathology.

## International Collaboration



**Dr. Steve Mills**  
Veterinary Clinical Pathologist  
*DVM, Dip ACVP (Clinical pathology)*

*Registered Specialist Veterinary Clinical Pathology*



**Dr. John Jardine**  
Veterinary Anatomical Pathologist  
*BVSc, MMV (Pathology), Dip ACVP*



**Dr. Charan Ganta**  
Veterinary Anatomical Pathologist  
*DVM, PhD, ACVP (Anatomic Pathology)*



**Dr. Rita Figueiredo Ornelas**  
Veterinary Clinical Pathology  
*LMV, MRCVS*

In addition to our local on-site pathologists, CityU VDL has expanded the veterinary expertise available in Hong Kong by partnering with international pathologists. Using the latest in imaging scanning technology board certified pathologists Dr. Steve Mills, Dr. John Jardine, Dr. Charan Ganta, and Dr. Rita Ornelas can review and comment on cases with CityU VDL.

## Section Heads



**Dr. Arthur Ching**, Molecular and Serology Scientist  
*BSc, PhD, MLT Part I*

Dr. Arthur Ching has more than 10 years of clinical experience in Molecular diagnostics and extensive research experience in molecular biology. He has a BSc in Biology and PhD degree from the Chinese University of Hong Kong. He is also a registered MLT Part I.



**Dr. Andrew Ferguson**, Microbiology Veterinarian  
*BVSc, GCVSt (Diag Path) MANZCVS (Pathobiology)*

In addition to working on pathology cases, Dr. Ferguson also leads the microbiology department. His extensive experience in many laboratory roles equips him well to guide this section.

# Laboratory Details

## Laboratory Overview

CityU Veterinary Diagnostic Laboratory (CityU VDL) provides a comprehensive veterinary diagnostic service to veterinarians, researchers and wildlife parks locally and regionally. In addition, it is a valuable resource for teaching undergraduate students at the City University Jockey Club College of Veterinary Medicine and Life Sciences, Bachelor of Veterinary Medicine program.

## Staff

At CityU VDL, our on-site staff work at our veterinary laboratory located on-campus at City University of Hong Kong. Our current pathology team includes eight specialist pathologists, five of whom are American Board Certified Pathologists (Dip. ACVP) and, a fellow of the Australian and New Zealand College of Veterinary Scientists (FANZCVS). Access to board certified veterinary clinical pathologists for cytology, blood smear analysis and consultation is also available. In addition, there are also highly trained medical laboratory technicians (MLT) and scientists in clinical pathology, histopathology, microbiology, immunology and molecular diagnostics. We are all committed to offer a high standard of service.

To contact our staff, simply phone the front desk (3442-4849). Our reception will handle your enquiry and direct you to the staff member required.

## Results

Results are validated by the duty pathologist and/or scientists and can be reported by email, fax or post to the submitter. Reports are confidential. CityU VDL keeps digital copies of the reports indefinitely and can re-issue them at the submitter's request.

Client feedback on service provision and timeliness is encouraged.

## Retention of Samples

CityU VDL keeps unfixed tissues for 14 days. Glass slides are kept for 3 years. Fixed tissues are kept for 30 days after reporting. Paraffin blocks are kept for 10 years. Submitters may request additional tests from the submitted tissues within these times.

## Fees

CityU VDL issues invoices with final reports and requires payment within 30 days of receiving the invoice. Statements are issued monthly.

## Referral of Samples

Please note, some tests offered at CityU VDL may be outsourced to overseas referral laboratories. Additional samples may be needed to ensure sufficient sample volume is available for testing.

# Filling in Submission Forms and Sample Submission Guidelines

## Submission of Samples

Samples must be submitted in the CityU VDL specimen bags (provided free on request) together with a completed Sample Submission Form.

Place all samples from a case into one specimen bag and place the Sample Submission Form into the pocket attached to the specimen bag. If the sample does not fit into the specimen bag (e.g. a 10L biopsy pot), please place the Submission Form into the specimen bag and securely attach the bag onto the sample.

Please correctly identify and label all samples, and fully complete all Sample Submission forms.

## Filling in a Submission Form

- Please fill in the **full name** of the submitting veterinarian. To avoid confusion during accessioning (which may result in delay of sample processing), please do not write the veterinarian's initials only.
- Please indicate what sample type has been submitted. For example, if multiple biopsy samples from multiple sites has been taken and placed into one biopsy pot, please indicate on the submission form which sites the biopsy samples are taken from.
- Please fill in all the fields on the submission form including date collected and time.
- If your clinic has multiple branches, please indicate in the clinic name field which branch you are submitting from. This will avoid confusion during accessioning and delay in sample processing.
- If there have been earlier submissions from a particular case, please include any previous case numbers so the prior findings can be correlated with the current case.

## Sample Submission

If a sample is submitted for two different tests (e.g. a nasal swab for culture and sensitivity as well as a viral PCR test) it is recommended to submit two separate samples from the same site, one for each test requested.



# Specimen Collection Guidelines

## Cytology

- Performed on fine needle aspirates (FNA), fluids, scrapings, and imprints.
- We recommend using slides with one end frosted. Write sample identification data here with pencil, as pen and felt tipped markers will wash off in fixative during staining. Label the sample clearly with the patient name, date of collection, and sample location.
- Avoid submitting slides in the same packaging with formalin-fixed samples as exposure to formalin can render cytology slides unreadable.
- Cytology cannot be done on swabs submitted in transport media.
- Body fluids (which includes abdominal, thoracic, pericardial, joints, and CSF) are best submitted in both EDTA and sterile tubes/containers. The EDTA preserves the cytology and prevents clotting to allow cell counts and protein estimates required for a full fluid analysis. The sterile tube/container may allow other procedures e.g. culture and some biochemistry tests. If there is insufficient volume available (e.g. CSF and joint fluid), then an EDTA sample is preferred. For very small samples a smear should be made from the fluid.
- Other fluids are best submitted in EDTA as cytology is required. However if culture is also required, a separate sample of the fluid must be submitted in a sterile container.
- For FNA samples, it is recommended to collect material from multiple separate aspirations taken from the lesion, from various locations within the sample, if size allows. This will increase the likelihood of a diagnosis. FNA samples that results in thick clumps on the slide do not typically have a monolayer of cells that is required for diagnosis. Visible clumps of cells should be spread over the surface of the slide by placing another slide at 90° to the first slide and smearing the clumps out with light pressure.
- CityU VDL fees apply to cytology examinations whether the slides contain diagnostic material or not. When aspirating lesions for cytology evaluation, check the smears as you collect them. If there are more than three smears, send the three best smears for cytology evaluation. The maximum number of cytology slides from each site for evaluation is three.
- If a sample is non-diagnostic, a second sample will be examined for free if submitted within 30 days. Remember to quote the previous case number.

## Histopathology

- For adequate formalin penetration, ensure all biopsy specimens are fixed in a 10:1 ratio of formalin to tissue.
- If possible, submit the WHOLE specimen. If the specimen size is large e.g. whole spleen, make multiple slices 1cm apart before placing in formalin to allow better formalin penetration as formalin does not penetrate greater than 5mm into tissue. The only exception is brain, which can be fixed whole without slicing.
- You may wish to ink the surgical margins prior to placement in formalin. Allow the ink to dry before putting into formalin.
- Specimens >5 cubic cms in volume may be fixed in formalin for 48 hours at the clinic and forwarded to the laboratory with a reduced formalin:tissue ratio. This is especially useful for large samples, where several days fixation in large volumes of formalin at the veterinary clinic leads to good tissue fixation. Lower volume of formalin is required when the sample is in transit.



- If accurate identification of individual tissue samples is required, multiple tissue samples should be placed in separate containers that are clearly labelled.
- All samples must be submitted in a leak-proof plastic container. Do not use glass containers as they may break during transportation. Plastic containers may be purchased from CityU VDL.

## Post Mortem

CityU VDL offers post-mortem services. **Before submitting cases, the veterinarian should contact CityU VDL's duty pathologist to discuss the circumstances of the case, the scope and costs of laboratory examination, and delivery of the animal.** All bodies should be kept in the refrigerator at 4°C.

Animal bodies undergoing post mortem are not allowed to be returned to the owner; however CityU VDL can release the body to a staff member of a cremation company, who are required to follow strict guidelines on handling prior to cremation. If the owner does not wish to have the body cremated, the body will be disposed of by CityU VDL and a body disposal fee will be applied (see page 11).

## Fluid Cytology & Analysis

We recommend clinicians prepare 2 slides and submit this to us as well as the fluid in an EDTA tube.

Container Type	
<b>EDTA tube</b>	Required with all fluids - preserves cytology, allows fluid analysis
<b>Sterile Tube</b>	For culture. Can be placed in sterile containers such as urine pots. Do not place in serum tube.
<b>Plain tube</b>	If requesting biochemistry of the fluid such as creatinine, cholesterol, and triglyceride

Below is a table indicating what container type to use for specific tests and what type of tests are required for different types of fluid.

Fluid Type Container Type	Fluid from Conventional Cavity (Abdominal, Thoracic, Pericardial, Joint, CNS)	Bronchoalveolar lavage (BAL) Transtracheal wash (TTW)	Other fluids (eg. seromas, haematomas, various washes such as nasal or prostatic washes)
EDTA	Cytology. Fluid Analysis always required for a proper diagnosis.	Cytology. No fluid analysis required.	Cytology. No fluid analysis required.  If stained cytology is required for a urine sample, the urine can be placed in an EDTA tube.
Sterile Tube	If culture required. This can be ordered if cytology suggests.  For CNS, as sample quantity is usually small and protein content is low, sample can be collected in sterile tube.	If culture required. This can be ordered if cytology suggests.	If culture required. This can be ordered if cytology suggests.

# HISTOPATHOLOGY

Turnaround time: **4 working days** (All turnaround times are calculated on receipt of samples by accessioning)

Histology	Comments	Test Includes
<b>Biopsy: 1 site</b>	Multiple lymph nodes are considered as 1 site (unlimited tissue size per site)	Includes one organ or site, full margin evaluation
<b>Biopsy: Additional sites</b>	Per additional biopsy from different organ samples or sites	Each additional site
<b>Endoscopic Biopsy</b>	For endoscopic intestinal biopsies from multiple intestinal sites	Includes multiple sites
<b>Mammary Gland Biopsy: 1 gland</b>	One nipple and mammary gland	
<b>Mammary Gland Biopsies: additional glands</b>	Additional nipple and mammary gland	Each additional nipple and mammary gland
<b>Dermatology Biopsies</b>	For general skin conditions where a mass is not involved (for example, conditions such as allergic dermatitis, pemphigus, etc.)	Includes up to 6 punch biopsies
<b>Histology collected from Post Mortem</b>	For samples collected during a post mortem that requires histological examination	Includes ONE block and ONE slide made
<b>Limb Dissection</b>	Whole limb submitted for dissection and sample collection	Includes sample collection only
<b>Special stains</b>	Will be determined by pathologist	
Immunohistochemistry	Comments	Test Includes
<b>IHC/ICC Marker</b>	For biopsy samples	Contact us for the list of IHC and ICC markers available

**NOTES:** For guides on how to collect a biopsy sample, please refer to page 7 & 8.

# POST MORTEM

Turnaround time:

**Gross pathology report: 1 working day**

**With histopathology results: 5 working days** (*allowing time for tissues to fix*)

*All turnaround times are calculated on receipt of samples by accessioning*

**\*Please contact the pathologist before submitting animals for post mortem. Call our reception at 3442-4849.**

Do not include histopathology or other tests. See "Histology collected from Post Mortem" above for histology done on post mortem samples.

Post Mortem	Comments	Test Includes
<b>Cat</b>	≤ 1kg	Gross pathology only
	> 1kg	Gross pathology only
<b>Dog</b>	≤ 5kg	Gross pathology only
	> 5kg	Gross pathology only
<b>Mini post mortem</b>	e.g. Limb, brain removal	Gross pathology only
<b>Pocket Pets</b>	For rabbits, rodents, ferrets	Gross pathology only
<b>Birds</b>		Gross pathology only
<b>Reptiles</b>	For chelonians, lizards, snakes	Gross pathology only
<b>Amphibians</b>		Gross pathology only
<b>Fish</b>	≤ 20cm	Gross pathology only
	> 20cm	Gross pathology only
<b>Others</b>	Any sample not in the categories above	Gross pathology only
<b>Body Disposal</b>	This is mandatory for all non-cremated post mortem cases sent to CityU VDL	

## NOTES:

- 1) Animal bodies undergoing post mortem are not allowed to be returned to the owner.
- 2) CityU VDL can release the body to a staff member of a cremation company, who are required to follow strict guidelines on handling prior to cremation.
- 3) If the owner does not wish to have the body cremated, the body will be disposed of by CityU VDL and a body disposal fee will be applied.

# CYTOLOGY

Resubmit within 30 days for free if the initial sample is non-diagnostic

Turnaround time: 2 working days (All turnaround times are calculated on receipt of samples by accessioning)

Cytology	Comments	Test Includes	Sample Required
<b>*Cytology First Site</b>	Maximum: Four slides per site (Each lymph node is considered as 1 site)		Fluid, smear, aspirates smeared on slides or in EDTA tube
<b>Cytology Additional Sites</b>	An add-on to "Cytology First Site". Sample must be from the same animal (Maximum: Four slides per site)		Fluid in EDTA tube; Aspirates or smears on glass slides  Wash samples from BAL, prostate, tracheal, cystic, nasal, urine, crop in EDTA tube. FNA, impression smears
<b>Immunocytochemistry (ICC) Marker</b>	For cytology samples		
<b>Fluid Analysis</b>	For thoracic, abdominal, pericardial, joint, and CSF  Note: CSF should be submitted to the VDL on the day of collection as cells degenerate quickly	Total protein, NCC, RBCC, gross appearance and cytology	Fluid in EDTA tube; slides may be submitted for cytology; fluid in plain tube if culture required
<b>Fluid Analysis additional sites</b>			
<b>*Cholesterol &amp; Triglyceride</b>	Ordered as an add-on test for fluid analysis only For chylothorax cases		
<b>*Creatinine</b>	Ordered as an add-on test for fluid analysis only. For abdominal fluids with suspected ruptured bladder		
<b>Bone Marrow Examination</b>	Bone marrow aspirate and peripheral blood required	CBC and cytology	Bone marrow aspirate in EDTA tube; blood smears, 1.3 ml whole blood in EDTA
<b>Buffy Coat Examination</b>			1.3 ml whole blood in EDTA
<b>Skin Scraping</b>			Smear on glass slide

\*If a sample is non-diagnostic, a second sample will be examined for free if submitted within 30 days. Remember to quote the previous case number.

\*A fluid analysis must be performed first before add-ons can be ordered.

# CLINICAL PATHOLOGY

All turnaround times (TAT) are calculated on receipt of samples by accessioning

Panels and Profiles	Test Includes	Sample Required	TAT
<b>Complete Blood Panel</b>	CBC + biochemistry (see CBC and Biochemistry panel for details)	1.3mL whole blood in EDTA tube <b>AND</b> 1.3mL clotted whole blood in serum tube	2 days
<b>Complete Cell Count (CBC)</b>	HCT, PCV, haemoglobin, RBCC, WBCC, MCV, MCH, MCHC, manual WBC differentials to derive % and absolute count, manual platelet count, TPP, cell morphology, platelet assessment. Reticulocyte count if anaemic. <b>All abnormal smears reviewed by a pathologist</b>	1.3mL whole blood in EDTA	2 days
<b>Biochemistry Panel (canine / feline)</b>	Na, K, Na:K (canine only), Cl, Ca, P, bicarbonate, anion gap, AST, ALT, ALP, GGT, CK, urea, creatinine, amylase, lipase, TP, albumin, globulin, total bilirubin, glucose, cholesterol, triglyceride	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Biochemistry Panel (equine)</b>	Na, K, Cl, Ca, phos, bicarbonate, anion gap, AST, ALP, GGT, CK, urea, crea, TP, alb, glob, gluc, chol, trig, total bilirubin	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Electrolyte Panel (canine, feline, equine)</b>	Na, K, Cl, bicarbonate	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Thyroid Panel (canine / feline)</b>	TT4, fT4, TSH	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Pre-anesthesia Panel</b>	Na, K, Cl, Bicarb, Anion Gap, Creatinine, Ca, Glucose, ALT	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Liver Panel</b>	Alb, AST, Glu, ALT, Urea, ALP, GGT, total bilirubin, cholesterol	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Renal Panel</b>	Na, K, Cl, Bicarb, Anion gap, Urea, Creatinine, Alb, Ca, P	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Total Protein Panel</b>	TP, Albumin, Globulin, A/G Ratio	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>NSAID Panel</b>	ALP, ALT, Urea, Creatinine, USG	1.3mL whole blood or 0.5mL serum in plain tube + 1mL urine	2 days

# CLINICAL PATHOLOGY

All turnaround times (TAT) are calculated on receipt of samples by accessioning

Haematology	Test Includes	Sample Required	TAT
<b>Direct Coombs Test (canine)</b>		1.3mL whole blood in EDTA + freshly prepared blood smear (unstained)	2 days
<b>Modified Knott's Test</b>		1.3mL whole blood in EDTA	2 days
Biochemistry	Test Includes	Sample Required	TAT
<b>Individual Analytes</b>	Please specify the analyte required on the submission form	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Bile Acid (fasting/random)</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Bile Acid (post-prandial)</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Canine TLI (Trypsin-Like Immunoreactivity)</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Feline TLI (R)</b>		1.3mL whole blood or 0.5mL serum in plain tube	12 days
<b>Folate</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Cobalamin (Vitamin B12)</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>GIT Panel Canine</b>	TLI, Folate & Cobalamin	1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Faecal occult blood</b>		Fresh faeces in faecal collection pot	2 days

(R) = Referral Test

# CLINICAL PATHOLOGY

All turnaround times (TAT) are calculated on receipt of samples by accessioning

Biochemistry	Test Includes	Sample Required	TAT
<b>Quantitative cPL</b> (R)		1ml serum (prefer fasted) in serum tube	7-8 days
<b>Quantitative fPL</b> (R)		1ml serum (prefer fasted) in serum tube	7-8 days
<b>Serum Electrophoresis</b>		1.3mL clotted whole blood in serum tube	4-5 days
<b>Serum Iron</b> (R)		2mL serum in serum tube	2-3 days
<b>Ionized Calcium</b> (R)		1mL serum in serum tube	2-3 days
Endocrinology	Test Includes	Sample Required	TAT
<b>ACTH Stimulation Test</b>	Basal cortisol level, post ACTH stimulation cortisol level	2 x 1.3mL whole blood or 2 x 0.5mL serum in plain tube (at 0min and 60 min)	2 days
<b>Low Dose Dexamethasone Suppression Test</b>	3-4 cortisol results at 0hr, 3-4hr, 8hr post dexamethasone injection.	3 x 1.3mL whole blood or 3 x 0.5mL serum in plain tube (at 0hr, 3-4hr, 8hr post dexamethasone injection)	2 days
<b>High Dose Dexamethasone Suppression Test</b>	3-4 cortisol results at 0hr, 3-4hr, 8hr post dexamethasone injection.	3 x 1.3mL whole blood or 3 x 0.5mL serum in plain tube (at 0hr, 3-4hr, 8hr post dexamethasone injection)	2 days
<b>Cortisol</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Total T4</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Free T4 (canine and feline)</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>TSH (canine and feline)</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days

(R) = Referral Test

# CLINICAL PATHOLOGY

All turnaround times (TAT) are calculated on receipt of samples by accessioning

Endocrinology	Test Includes	Sample Required	TAT
<b>Progesterone</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Fructosamine</b>		1.3mL whole blood or 0.5mL serum in plain tube	2 days
<b>Insulin</b> (R)		2mL serum in serum tube	14 days
<b>Parathyroid Hormone (PTH)</b> (R)		1mL frozen serum in serum tube (non-hemolysed/non-lipaemic)	10 days
<b>Parathyroid hormone-related protein (PTHrp)</b> (R)		1mL frozen EDTA plasma in plain tube (non-hemolysed/non-lipaemic). Separate plasma within 1hr of collection	10 days
<b>Relaxin</b> (R)		0.5mL heparinised plasma in plain tube (30 days post breeding)	14 days
Coagulation	Test Includes	Sample Required	TAT
<b>Coagulation panel</b>	PT, PTT	2mL whole blood in sodium citrate tube, or to the marking on the tube	2 days
<b>Coagulation panel + fibrinogen</b>	PT, APTT, Fibrinogen	2mL whole blood in sodium citrate tube, or to the marking on the tube	2 days
<b>Coagulation profile</b>	PT, PTT, CBC	2mL whole blood in sodium citrate tube, or to the marking on the tube <b>AND</b> 1.3ml whole blood in EDTA	2 days
<b>Fibrinogen</b>		2mL whole blood in sodium citrate tube, or to the marking on the tube	2 days
Therapeutics	Test Includes	Sample Required	TAT
<b>Phenobarbitone</b>		1.3mL whole blood or 0.5mL serum in plain tube. Do NOT place in gel tube	2 days
<b>Potassium Bromide</b> (R)		2mL serum in serum tube Do NOT place in gel tube	10 days

(R) = Referral Test



# CLINICAL PATHOLOGY

All turnaround times (TAT) are calculated on receipt of samples by accessioning

Therapeutics	Test Includes	Sample Required	TAT
<b>Levetiracetam (keppra)</b>		1mL serum in serum tube	4-5 days

<b>Zonisamide</b>		1) 2mL of non-hemolysed separated serum or 2) non-hemolysed EDTA plasma or 3) non-hemolysed heparinised plasma	4-5 days
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<b>Cyclosporine (R)</b>		3mL whole blood in EDTA	7 days
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Toxicology	Test Includes	Sample Required	TAT
<b>Blood Lead (R)</b>		2mL whole blood in heparin tube	2-3 days

<b>Serum Zinc (R)</b>		2mL serum in serum tube	3-4 days
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<b>Cholinesterase (R)</b>		2mL non-hemolysed serum in serum tube	10 days
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Urine Analysis	Test Includes	Sample Required	TAT
<b>Urinalysis</b>	Colour, turbidity, dipstick (pH, TP, glucose, ketones, bilirubin, blood), specific gravity, and sediment examination	Urine in sterile urine collection pot	2 days

<b>Urine Protein:Creatinine Ratio (UPCR)</b>		Urine in sterile urine collection pot	2 days
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<b>Urine Cortisol:Creatinine Ratio (UCCR)</b>		Urine in sterile urine collection pot	2 days
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Others	Test Includes	Sample Required	TAT
<b>Amino acids (R)</b>		2mL non-hemolysed heparinised plasma in plain tube	18-20 days

<b>Taurine (R)</b>		1mL non-hemolysed heparinised plasma in plain tube	18-20 days
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(R) = Referral Test

# MICROBIOLOGY

All turnaround times are calculated on receipt of samples by accessioning

Microbiology	Comments	Test Includes	Sample Required	TAT
<b>Cystitis Package</b>		Urinalysis, Culture and AST	Urine in sterile collection pot	1-3 days
<b>Aerobic Culture only</b>	Antimicrobial Sensitivity Testing (AST) not included	Culture only	Fluid in sterile pot, or swab in transport medium	3 days
<b>Aerobic Culture &amp; Sensitivity</b>		Culture and AST by disc diffusion	Fluid in sterile pot, or swab in transport medium	4 days
<b>Aerobic Culture &amp; MIC</b>		Culture and AST by MIC	Fluid in sterile pot, or swab in transport medium	4 days
<b>Anaerobic Culture only</b>	AST not included	Culture only	Fluid in sterile pot, or swab in transport medium	3-8 days
<b>Anaerobic Culture &amp; MIC<sup>^</sup></b>		Culture and AST by MIC	Fluid in sterile pot, or swab in transport medium	4-9 days
<b>Aerobic and Anaerobic Culture</b>		Culture only	For deep wounds, pus, abscess and sterile body fluids only	3-8 days
<b>Aerobic Culture &amp; Sensitivity + Anaerobic Culture &amp; MIC</b>		Aerobic: Culture and AST by disc diffusion Anaerobic: Culture and AST by MIC	For deep wounds, pus, abscess and sterile body fluids only	4-9 days
<b>Aerobic and Anaerobic Culture &amp; MIC</b>		Culture and AST by MIC	For deep wounds, pus, abscess and sterile body fluids only	4-9 days
<b>Blood culture only</b>	AST not included. Blood Culture Bottles are suitable for most fluids	Culture only	Blood Culture Bottle*	4-10 days
<b>Blood Culture and Sensitivity</b>	Blood Culture Bottles are suitable for most fluids	Culture and AST by disc diffusion	Blood Culture Bottle*	4-12 days
<b>Blood culture and MIC</b>	Blood Culture Bottles are suitable for most fluids	Culture and AST by MIC	Blood Culture Bottle*	4-12 days
<b>Faecal culture</b>	AST not included	Culture only	Fresh faeces in faecal collection pot	3 days
<b>Faecal culture &amp; sensitivity</b>		Culture and AST by disc diffusion	Fresh faeces in faecal collection pot	4 days

# MICROBIOLOGY

All turnaround times are calculated on receipt of samples by accessioning

Microbiology	Comments	Test Includes	Sample Required	TAT
<b>Faecal culture &amp; MIC</b>		Culture and AST by MIC	Fresh faeces in faecal collection pot	4 days
<b>Fungal Culture</b>	AST not included	Culture only	Hair, tissue, toothbrush place in a urine pot, paper envelope, or a zip lock bag, or swab	14 days
<b>Urine culture and sensitivity</b>	Free MIC for any high resistance organisms	Culture and AST by disc diffusion	Urine in sterile collection pot	4 days
<b>Urine Culture &amp; MIC</b>		Culture and AST by MIC	Urine in sterile collection pot	4 days
<b>Sensitivity testing<sup>^</sup></b>	Add on an antimicrobial panel to existing aerobic culture results			2 days
<b>MIC<sup>^</sup> Sensitivity</b>	Add on an antimicrobial panel to existing culture results (aerobic or anaerobic)			2-4 days
<b>Staining: Gram Stain</b>			Fluid in sterile pot, or swab in transport medium	1 day
<b>Staining: Acid Fast</b>			Fluid in sterile pot, or swab in transport medium	1 day

\*Contact lab for delivery of blood culture bottles

<sup>^</sup>AST per organism

Faecal Analysis	Comments	Test Includes	Sample Required	TAT
<b>Qualitative Faecal Floatation</b>			Fresh faeces in faecal collection pot	2 days
<b>Faecal Smear</b>			Fresh faeces in faecal collection pot	1 day
<b>Larval Culture</b>	Parasite eggs are hatched and the larva examined		Fresh faeces in faecal collection pot	14 days
<b>Faecal Sedimentation Baermann Test</b>	To test for lungworm		Fresh faeces in faecal collection pot	2 days

# MOLECULAR PCR

Turnaround Time: 1-3 working days

All turnaround times are calculated on receipt of samples by accessioning

Tick	Test Includes	Sample Required
<b>Canine Anaemia Panel</b>	<i>Babesia canis vogeli</i> , <i>Babesia gibsoni</i> , <i>Ehrlichia</i> <i>spp</i> , <i>Anaplasma spp</i> , CBC & Coombs Test	1.3ml EDTA whole blood
<b>Comprehensive Tick Fever Panel</b>	<i>Babesia canis vogeli</i> <i>Babesia gibsoni</i> <i>Ehrlichia canis</i> <i>Anaplasma spp</i>	1.3ml EDTA whole blood
<b>Babesia Panel</b>	<i>Babesia canis vogeli</i> <i>Babesia gibsoni</i>	1.3ml EDTA whole blood
<b>Babesia vogeli</b>		1.3ml EDTA whole blood
<b>Babesia gibsoni</b>		1.3ml EDTA whole blood
<b>Ehrlichia canis</b>		1.3ml EDTA whole blood
<b>Ehrlichia spp</b>		1.3ml EDTA whole blood
<b>Anaplasma spp</b>		1.3ml EDTA whole blood
Canine Specific PCR	Test Includes	Sample Required
<b>Canine Diarrhoea Panel</b>	<i>Giardia intestinalis</i> , <i>Isospora/Cystoisospora</i> , <i>Penta-trichomonas</i> <i>hominis</i>	1) 3g faeces or 2) rectal swab
<b>Canine Comprehensive Diarrhoea Panel</b>	<i>Cryptosporidium parvum</i> , <i>Giardia intestinalis</i> , <i>Penta-</i> <i>trichomonas hominis</i> , <i>Isospora/Cystoisospora</i>	1) 3g faeces or 2) rectal swab
<b>Canine Distemper Virus</b>		1) 1.3ml EDTA whole blood or 2) 5ml urine or 3) nasal or conjunctival dry swab or 4) lung tissue
<b>Canine Parvovirus</b>		1) 3g faeces or 2) rectal swab
<b>Faecal Parasites</b>	<i>A. caninum</i> <i>A. ceylanicum</i> <i>D. caninum</i> <i>T. canis</i> <i>T. vulpis</i> <i>U. stenocephala</i>	3g faeces in faecal collection pot
<b>Leptospira</b>	Collect blood in acute infections only. Collect urine for longer infection and to check treatment efficacy	1) 2ml urine or 2) 1.3ml EDTA whole blood 3) Tissues (kidney and/or liver, fetal lung, kidney, liver, stomach, or abomasal content, placenta)

For all PCR tests, please do not use bacterial gel swab for sampling.

Individual tests in panel can be considered to order as a standalone test. Please call the Molecular section to confirm availability.

# MOLECULAR PCR

Turnaround Time: 1-3 working days

All turnaround times are calculated on receipt of samples by accessioning

Feline Specific PCR	Test Includes	Sample Required
<b>Bordetella bronchiseptica</b>	<i>B. bronchiseptica</i>	1) Pharyngeal dry swab or 2) 1ml BAL in plain sterile tube
<b>Candidatus Mycoplasma haemominutum</b>		1.3ml EDTA whole blood
<b>Chlamydophila felis</b>		Ocular, conjunctiva dry swab
<b>Feline Anaemia Panel</b>	Mhf, CMhm	1.3ml EDTA whole blood
<b>Feline Anaemia Panel Comprehensive</b>	Mhf, CMhm, FIV, FeLV	1.3ml EDTA whole blood
<b>Feline Anaemia Panel Plus CBC</b>	Mhf, CMhm, CBC	1.3ml EDTA whole blood
<b>Feline Anaemia Panel Plus Complete Blood Panel</b>	Mhf, CMhm, CBC & Biochemistry	1.3ml EDTA whole blood and 1.3mL clotted whole blood in serum tube
<b>Feline Coronavirus</b>		1) 1.3ml EDTA whole blood 2) 2ml ascites or body fluid
<b>Feline Calicivirus</b>		1) Nasal or oropharyngeal dry swab or 2) nasal biopsy or 3) lung tissue
<b>Feline Diarrhoea Panel</b>	Cryptosporidium parvum, Giardia intestinalis, Feline coronavirus, Feline panleukopenia virus, Tritrichomonas foetus	1) 3g faeces or 2) rectal swab
<b>Feline Herpesvirus</b>		1) Nasal dry swab or 2) pharyngeal dry swab, or 3) oral dry swab or ocular (cornea) dry swab
<b>Feline Immunodeficiency Virus (FIV)</b>		1.3ml EDTA whole blood
<b>Feline Leukemia Virus (FeLV)</b>		1.3ml EDTA whole blood
<b>Feline Panleukopenia Virus</b>		1) 3g faeces or 2) rectal swab
<b>Feline Respiratory Panel</b>	Bordetella spp., Feline calicivirus, Chlamydophila felis, Feline herpesvirus, Mycoplasma felis	Oropharyngeal ± nasal ± ocular dry swab. Fresh respiratory tissue
<b>Mycoplasma felis</b>		1) Dry swab from respiratory system or 2) ocular dry swab
<b>Mycoplasma haemofelis</b>		1.3ml EDTA whole blood
<b>Toxoplasma gondii</b>		1) 3g faeces in fecal collection pot or 2) fresh tissue

For all PCR tests, please do not use bacterial gel swab for sampling.

Individual tests in panel can be considered to order as a standalone test. Please call the Molecular section to confirm availability.

# MOLECULAR PCR

Turnaround Time: 1-3 working days

All turnaround times are calculated on receipt of samples by accessioning

PCR Others	Test Includes	Sample Required
<b>Batrachochytrium dendrobatidis</b>		Skin swab
<b>Clostridium perfringens</b>		1) 1g faeces or 2) rectal swab or 3) Colonic flush
<b>COVID-19</b>	Special conditions apply	Deep oropharyngeal swab or deep nasal swab (swab provided)
<b>Dermatophytosis Panel</b>	<i>M. canis</i> <i>M. gypseum</i>	Plucked hair or skin scraping placed in plain sterile tube
<b>Giardia intestinalis</b>		3g faeces in faecal collection pot
<b>Lawsonia intracellularis</b>		3g faeces in faecal collection pot or 1.3mL EDTA whole blood
<b>Microsporium canis</b>		Plucked hair or skin scraping placed in plain sterile tube
<b>Microsporium gypseum</b>		Plucked hair or skin scraping placed in plain sterile tube
<b>Mycobacterium species</b>	Various mycobacterium spp.	Tissues from lymph nodes or faeces
<b>Mycobacterium Tuberculosis Complex</b>	<i>M. tuberculosis</i> <i>M. africanu</i> <i>M. canetti</i> <i>M. bovis</i> <i>M. microti</i>	Tissues from lymph nodes or faeces
<b>Mycoplasma species</b>	This PCR is designed to have the broadest detection profile possible to the respiratory Mycoplasma spp.	Dry oropharyngeal ± nasal ± ocular swab. Fresh respiratory tissue
<b>Pan-fungal</b>	Sanger sequencing if gel PCR positive	
<b>Psittacine beak and feather disease virus</b>		1) Plucked feather or 2) Blood
<b>Trichomonas foetus</b>		3g faeces in faecal collection pot

For all PCR tests, please do not use bacterial gel swab for sampling.

Individual tests in panel can be considered to order as a standalone test. Please call the Molecular section to confirm availability.

# MOLECULAR PCR

Turnaround Time: 1-3 working days

All turnaround times are calculated on receipt of samples by accessioning

Rodent Specific PCR	Test Includes	Sample Required
<b>Aspicularis tetraptera</b>	Pinworm detection in faeces	5 faecal pellets min from individual or pooled from the cage
<b>Syphacia obvelata</b>	Pinworm detection in faeces	5 faecal pellets min from individual or pooled from the cage
<b>Syphacia muris</b>	Pinworm detection in faeces	5 faecal pellets min from individual or pooled from the cage
<b>Mouse hepatitis virus (MHV)</b>	MHV detection in faeces	5 faecal pellets min from individual or pooled from the cage
<b>Pinworm panel (includes Aspicularis tetraptera, Syphacia obvelata and Syphacia muris)</b>	Pinworm detection in faeces	5 faecal pellets min from individual or pooled from the cage
<b>Pinworm + MHV panel (includes Aspicularis tetraptera, Syphacia obvelata, Syphacia muris and MHV)</b>	Pinworm and MHV detection in faeces	5 faecal pellets min from individual or pooled from the cage

For all PCR tests, please do not use bacterial gel swab for sampling.

Individual tests in panel can be considered to order as a standalone test. Please call the Molecular section to confirm availability.

# SEROLOGY TESTING

Turnaround Time: 1-3 working days

All turnaround times are calculated on receipt of samples by accessioning

Tests	Diagnostic Detection	Sample Required
<b>Giardia</b>	Antigen	3g faeces
<b>Canine Dirofilaria immitis and D. repens</b>	Antigen	1.3mL clotted whole blood in serum tube
<b>Canine Vaccination Titre</b> (Canine Infectious Hepatitis Virus, Parvovirus, Distemper Virus)	Antibody	1.3mL clotted whole blood in serum tube
<b>Canine Antinuclear Antibody (ANA)</b>	Antibody	1.3mL clotted whole blood in serum tube
<b>Feline Toxoplasma gondii IgM</b>	Antibody	1.3mL clotted whole blood in serum tube
<b>Feline Toxoplasma gondii IgG</b>	Antibody	1.3mL clotted whole blood in serum tube
<b>Feline Vaccination Titre</b> (Feline Panleukopenia Virus, Herpes Virus, Calici Virus )	Antibody	1.3mL clotted whole blood in serum tube
<b>Rabbit Encephalitozoon cuniculi IgM</b>	IFAT	1.3mL clotted whole blood in serum or plasma tube
<b>Rabbit Encephalitozoon cuniculi IgG</b>	IFAT	1.3mL clotted whole blood in serum or plasma tube



# GENETICS TESTING<sup>(R)</sup>

**Turnaround time: 2 weeks**

*All turnaround times are calculated on receipt of samples by accessioning*

## Single Genetic Disease

DNA test of a specific disease or trait and includes:

### Canine

- Arrhythmogenic Right Ventricular Cardiomyopathy
- Cone Degeneration
- Congenital Hypothyroidism
- Congenital Myotonia
- Cyclic Neutropenia / Gray Collie Syndrome
- Copper Toxicosis
- Exercise Induced Collapse
- Factor IX / Haemophilia B
- Factor VII Deficiency
- Gangliosidosis
- Hereditary Nephropathy
- Juvenile Dilated Cardiomyopathy
- Ivermectin and Multi Drug Sensitivity
- Musladin-Lueke Syndrome
- Mucopolysaccharidosis VII
- Narcolepsy
- Neuronal Ceroid Lipofuscinosis
- Osteogenesis Imperfecta
- Phosphofructokinase Deficiency
- Pyruvate Kinase Deficiency
- Primary Open Angle Glaucoma
- von Willebrand's Disease
- Cobalamin Malabsorption
- Collie Eye Anomaly
- Canine Leucocyte Adhesion Deficiency
- Canine Multifocal Retinopathy Type 1
- Congenital Stationary Night Blindness
- Degenerative Myelopathy
- Fucosidosis
- Familial Nephropathy
- Globoid Cell Leukodystrophy/Krabbe's Disease
- Hereditary Cataracts
- Hyperuricosuria
- L-2-Hydroxyglutaric Aciduria
- Malignant Hyperthermia
- Mucopolysaccharidosis
- Multifocal Retinopathy
- Neonatal Cortical Cerebellar Abiotrophy
- Neonatal Encephalopathy with Seizures
- Pyruvate Dehydrogenase Phosphatase 1 Deficiency
- Primary Hyperoxaluria
- Primary Lens Luxation
- Severe Combined Immune Deficiency

Plus many more (contact lab to ask about other specific diseases/traits).

### Feline

- Blood Group
- Familial Hypertrophic Cardiomyopathy
- Gangliosidosis 1
- Polycystic Kidney Disease
- Progressive Retinal Atrophy
- Spinal Muscular Atrophy
- Familial Episodic Hypokalaemic Polymyopathy
- Familial Hypertrophic Cardiomyopathy
- Gangliosidosis 2
- Pyruvate Kinase Deficiency
- Progressive Retinal Atrophy

Plus many more (contact lab to ask about other specific diseases/traits).

## Sample Required

EDTA blood or dry cheek swab

# GENETICS TESTING<sup>(R)</sup>

**Turnaround time: 2 weeks**

*All turnaround times are calculated on receipt of samples by accessioning*

Genetics Testing	Test Includes	Sample Required
<b>Breed Identification Test*</b>	DNA test to identify the breeds present in a mixed-breed dog. Can also be used to verify a breed.	Dry cheek swab
<b>Canine General Plan</b>	Degenerative Myelopathy; Hereditary Cataract; Hyperuricosuria; Multi Drug and Ivermectin Sensitivity.	EDTA blood
<b>Canine Comprehensive Plan</b>	Cobalamin Malabsorption; Degenerative Myelopathy; Hereditary Cataract; Hyperuricosuria; Multi Drug and Ivermectin Sensitivity; von Willebrand's Disease.	EDTA blood
<b>Canine Breeding Plan</b>	Degenerative Myelopathy; Hyperuricosuria; Malignant Hyperthermia; Multi Drug and Ivermectin Sensitivity.	EDTA blood
<b>Feline General Plan</b>	Familial Hypertrophic Cardiomyopathy; Hyperoxaluria; Polycystic Kidney Disease; Vitamin D-dependent rickets.	EDTA blood
<b>Feline Comprehensive Plan</b>	Haemophilia B; Familial Hypertrophic Cardiomyopathy; Hyperoxaluria; Polycystic Kidney Disease; Progressive Retinal Atrophy; Vitamin D-dependent rickets.	EDTA blood
<b>Feline Breeding Plan</b>	Blood Group B; Haemophilia B; Familial Hypertrophic Cardiomyopathy; Polycystic Kidney Disease.	EDTA blood

\*Turnaround time 5-6 weeks

(R) = Referral Test

# CONSUMABLE MATERIALS

<b>Fecal and Urine Pot</b>	<b>Min. Order Quantity</b>
70mL Urine Container, sterile*	10
60mL Fecal Screw Cap Container with Scoop*	10

<b>Blood Tubes</b>	<b>Min. Order Quantity</b>
1.3mL EDTA Micro Tube*	20
2mL Vacutainer, Citrate (Light Blue Top)*	4

<b>Swabs</b>	<b>Min. Order Quantity</b>
Swab, aerobic culture*	10

<b>Slide Holder</b>	<b>Min. Order Quantity</b>
Slide Mailer, 2 slides*	10
Slide Mailer, 5 slides*	10

<b>Biopsy Container</b>	<b>Min. Order Quantity</b>
250mL Biopsy Screw Cap Container, non-sterile	10
500mL Biopsy Container, non-sterile	1
1L Biopsy Bucket, non-sterile	1
3L Biopsy Bucket, non-sterile	1
5.4L Biopsy Bucket, non-sterile	1
10L Biopsy Bucket, non-sterile	1

<b>Formalin</b>	<b>Min. Order Quantity</b>
10% Neutral Buffered Formalin, 5L	1

\*Free of charge as long as samples are submitted to CityU VDL.

# CITYU VETERINARY DIAGNOSTIC LABORATORY

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