香港城市大學
City University of Hong Kong

VETERINARY DIAGNOSTIC LABORATORY

# CITYU VETERINARY DIAGNOSTIC LABORATORY

## MESSAGE FROM THE DIRECTOR

Welcome to the 4th edition of volume three of the newsletter.

I would like to thank all our valued clients for your support of CityU VDL over the past year. Through four waves of COVID-19 infection you have maintained veterinary services for your clients and patients and CityU VDL has been proud to provide uninterrupted diagnostic services. I would like to take this opportunity to wish you season's greetings for the Christmas and New Year holidays and hope you enjoy any holiday breaks you get.

- Dr Fraser Hill, Anatomic Pathologist, Director of CityU VDL

## IN THIS ISSUE



## SNIPPETS

Throughout the year CityU VDL provides high quality results with a rapid turn around time on cases sent to the laboratory at CityU and examined by on-site staff. Along with the common and expected cases we also see new and unusual findings including the detection of *Hepatozoon canis* in blood from a dog, and identification of the ticks carrying the pathogen. Also *Babesia canis vogeli* was visualised in red blood cells after cross checking a positive PCR sample.

By screening routine cases and considering diagnostic options CityU VDL keeps veterinary diagnostics current with new diseases and diagnostic trends.

CityU VDL staff contribute to other facets of the veterinary community. Dr Vidya Bhardwaj serves both the Hong Kong Veterinary Association Committee and was recently elected to the Hong Kong Veterinary Surgeons Board, while Dr Fraser Hill assists the Hong Kong Veterinary Surgeons Board in the assessment of specialists.

# Identification of *Hepatozoon canis* and *Rhipicephalus sanguineus* ticks

*Hepatozoon canis* is a tick-borne protozoan affecting dogs in many countries. Recently organisms consistent with *H canis* were seen within neutrophils in the blood smear of a Hong Kong dog (figure 1) by Dr Daniela Hernandez Muguiro. Initial diagnosis of hepatozoonosis was done after the detection of intracytoplasmic ellipsoidal-shaped gamonts in leukocytes. Hepatozoon canis was confirmed by PCR. Subsequently ticks collected from the dog were sent to Australia by Dr Andrew Ferguson for identification (figure 2). The ticks were morphologically consistent with both male and female *Rhipicephalus sanguineus.* *H canis* DNA was detected in the tissues of the ground-up ticks by realtime PCR.

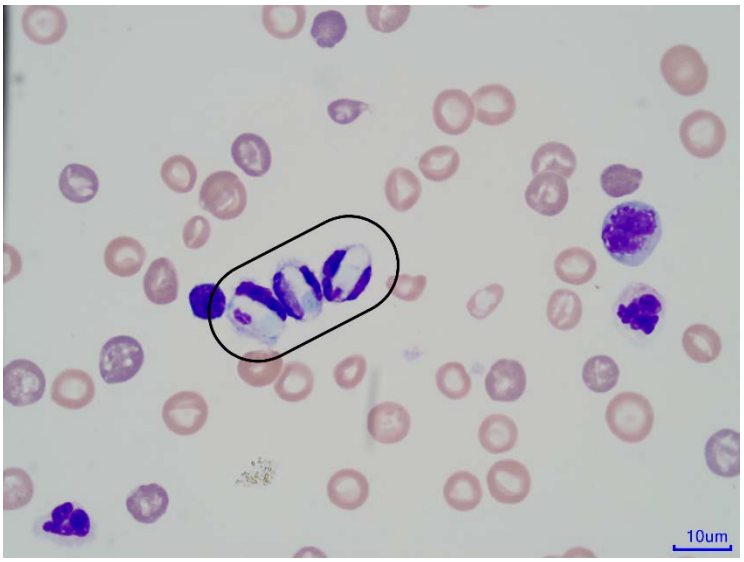


Figure 1: Ellipsoid gamonts consistent with *Hepatozoon canis* are present within the cytoplasm of three leukocytes (circled) on the blood smear of a dog

Figure 2: Image of ticks collected from the affected dog morphologically identified as *Rhipicephalus sanguineus.* The tick on the left is unengorged and about 4 mm long, the centre image shows the smaller tick riding on the engorged tick, the image on the right is an engorged tick about 15 mm long.

## *Babesia canis vogeli* images

There are two types of tick transmitted intraerythrocytic parasitic *Babesia* species affecting the red blood cells of dogs in Hong Kong: *B gibsoni* and *B canis*. *B gibsoni* is a smaller organism arranged in single to multiple signet rings within infected red blood cells. *B canis* is a larger singular or paired piroplasm and may be oval or pear shaped. Three subspecies of *B canis* are recognised: *B canis canis*, *B canis vogeli*, and *B canis rossi*. All three are morphologically indistinguishable but *B canis vogeli* was recently identified by PCR testing at CityU VDL and Dr Daniela Hernandez Muguiro observed the organism within red blood cells of the same sample and captured these images (figure 3).

CityU VDL offers PCR testing for *B gibsoni, B canis vogeli, B canis canis* and *Ehrlichia canis* ether individually or in panels. Since testing began in 2017 the percentage of positive results for each species are:

| Pathogen | % positive |
|---|---|
| Babesia gibsoni | 21 |
| Ehrlichia canis | 7 |
| Babesia canis vogeli | 2 |
| Babesia canis canis | 0 |

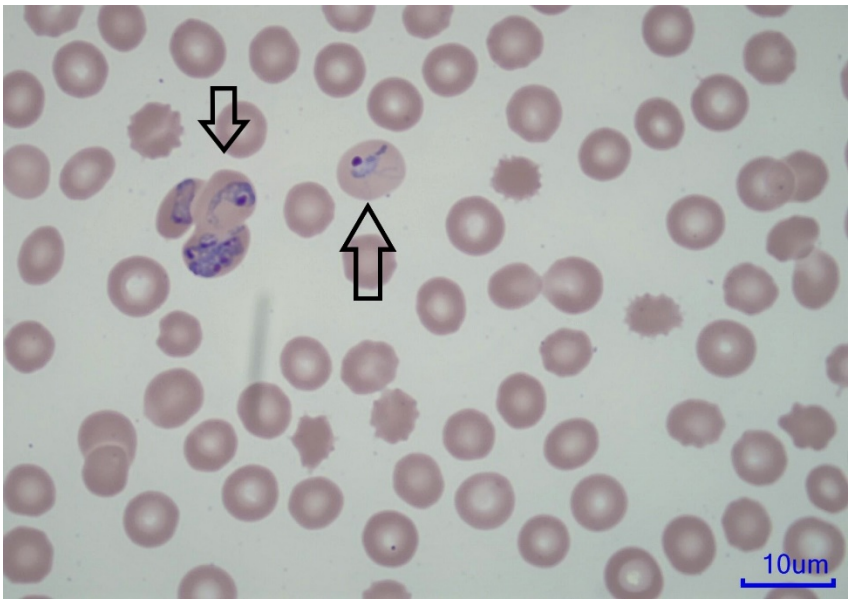


Figure 3: Parasitic piroplasms within the red blood cells of a dog (arrows) confirmed as *B canis vogeli* by PCR testing

## Coombs' test: CBC recommended

It is strongly recommended to request a complete blood count (CBC) on any EDTA blood sample sent in for Coombs' testing. In the haematology section at CityU VDL, a blood smear is prepared prior to undertaking a Coombs' test so a CBC can be undertaken if required. If you forget to request the CBC at the outset, please call the laboratory on 3442 4849 to add this test. Examining a CBC allows checks for neoplastic cells and intraerythrocytic parasites.

## Christmas treats are great for humans but not cats and dogs

A range of food and flowers associated with Christmas add cheer and joy to the Christmas season but some holiday treats and traditions can be hazardous to pets.

Here are a few to keep in mind.

Christmas lilies (*Lilium regale*):

Lilies from the genera *Lilium* (true lilies) and *Hemerocallis* (day lilies) have been associated with renal failure in cats but not dogs due the presence of toxic steroidal glycoalkaloids. All parts of the plant are toxic, including the pollen, so keep them well away from cats.

Christmas food containing raisins eg mince pies, cakes and pudding:

Eating raisins or grapes is associated with acute renal failure in dogs and possibly cats. The toxin is unclear but thought to be the skin and flesh of the grape or raisin.

Chocolate:

Chocolate contains theobromine and this can lead to toxicity in dogs of varying severity depending on the amount consumed.

Onions (*Allium* species):

Both onions and garlic and food containing them have sulphur containing oxidants. Heinz body formation and methaemoglobin increases in red cells can lead to haemolysis about 72 hours after consumption

Ham:

Ham contains high concentrations of salt and can result in salt toxicity in dogs if excessive quantities are consumed.

Remind your clients to feed their pets recommended pet food only and not share humans Christmas goodies. For toxicity investigations, history and access to these types of foods or lilies is a critical component in achieving a diagnosis. Serum chemistry and complete blood counts can be useful to give important clues but specific toxin analysis is not possible.

# TESTING TIPS

## Options for immunohistochemical, immunocytochemical and special stains

CityU VDL offers a wide range of immunohistochemical (IHC), immunocytochemical (ICC) and special stains to identify cell and tissue types, infectious agents, proteins, and intracellular components.

CityU VDL pathologists will elect to do the special stains based on the pathology in the sample, while IHC and ICC stains will be recommended to you and your clients.

Call 34424898 or email infovdl@cityu.edu.hk to request these additional stains.

If you would like the stains added at the time of processing please indicate your preferences on the submission form in the Histopathology/Post Mortem section.

## Microbiology Anaerobic Culture

Anaerobic bacteria are fastidious and require special care to ensure good growth in the laboratory. Anaerobic cultures should be performed on any lesions suggestive of an anaerobic infection. CityU VDL offers the BBL Port-A-Cul tube to enhance your ability to isolate anaerobes from your patients and in addition, offers on-site minimum inhibitory concentration (MIC) testing for anaerobic isolates to assist you in deciding on therapy.

### When do I choose an anaerobic culture?

Anaerobic bacteria grow in a low oxygen, warm and moist environment and are normal flora in several anatomical locations. For an anaerobic infection to be established, the redox potential of the tissue must be lowered. This occurs with trauma, necrosis, ischaemia, parasitic infections and importantly, concomitant infections with a facultative anaerobe.
Lesions that support the growth of anaerobes include: abscesses, cellulitis, osteomyelitis, joint infections, periodontal abscesses, post-operative wounds, surgical implants, pleural and peritoneal infections and bacteraemia.

Suitable tissues to sample include:
Pus or aspirates from deep wounds and abscesses, normally sterile body fluids (pleural/ peritoneal/ synovial/ bile), surgical implants, and tissues biopsied from normally sterile sites.

Specimens NOT suitable for anaerobic culture include:
Saliva, oral or nasal swabs, tracheal swabs, skin or superficial wound swabs and urine.

### How do I submit a sample for anaerobic culture?

Samples should be collected in a strictly aseptic manner and submitted to the laboratory using specialized collection receptacles that provide an anaerobic micro-environment e.g. BBL Port-A-Cul tubes for swabs and tissues and blood culture bottles for fluids.

## IMPORTANT: DO NOT REFRIGERATE SAMPLES FOR ANAEROBIC CULTURE

### How do I select the most appropriate antimicrobial agent for therapy?

Antimicrobial agents generally successful against anaerobic infections in animals include clindamycin, metronidazole, chloramphenicol, penicillins and β-lactam combination agents. However, due to the recent development of antimicrobial resistance, it is best to perform antimicrobial sensitivity testing (AST) by MIC.
The panel for AST in anaerobes comprises clindamycin, chloramphenicol, amoxicillin-clavulanate and ticarcillin-clavulanate*. The cephems (cephalosporins) and fluoroquinolones are not included in the panel as they are generally ineffective against anaerobes (cefoxitin and moxifloxacin are exceptions).
*- *Metronidazole is not included for testing as studies have shown that the current method of assessing metronidazole resistance in anaerobes underestimates the MIC and is not an accurate representation of in vivo clinical efficacy.*

**To order BBL Port-A-Cul tubes or blood culture bottles call the laboratory on 3442 4849.**

# Gastrointestinal Testing Options

CityU VDL has a wide range of histopathology, molecular, microbiological, parasitological, biochemical and direct tests for investing gastrointestinal disease in your animal patients. The types of tests are included below:

| | |
|---|---|
| **Histopathology** | Gastrointestinal biopsies |
| **Molecular tests** | Canine Diarrhoea Panel<br>Feline Diarrhoea Panel<br>Tritrichomonas foetus<br>Giardia<br>Toxoplasma gondii<br>Feline Panleukopaenia virus<br>Canine Parvovirus |
| **Biochemical** | Canine TLI<br>Feline TLI<br>Folate<br>Cobalamin<br>GIT Panel (TLI/Folate/Cobalamin)<br>Faecal occult blood<br>Qualitative Pancreatic Lipase (canine/feline)<br>Quantitative Pancreatic Lipase (canine/feline) |
| **Microbiology** | Faecal culture |
| **Direct examination** | Faecal Smears |
| **Parasitology** | Faecal Floatation<br>Larval Culture<br>Baermann Test |

# Canine and Feline Genetic Disease testing

CityU VDL are now offering local Hong Kong testing for canine and feline genetic diseases. You may submit either cheek swabs or EDTA swabs, using our standard CityU VDL submission form for collection by our team of couriers – phone 34420 4849 for sample pick-up. The turnaround time is 12 working days and the available tests are:

See https://www.amvetbio.com/products/ for details of genetic tests available.

# STAFF PROFILE

## Molecular and Serology Section:

Dr Christina To (BSc, MPhil, MSc, PhD, MLT I, Section leader)

Dr Arthur Ching (BSc, PhD, MLT I, Technologist)

Miss Lai On Chu (BSc, MPhil, MLT I, Technologist)

Led by Dr Christina To, the molecular and serology team includes Dr Arthur Ching and Miss Lai On Chu. Dr To received her PhD in pathology from the University of Hong Kong and has over 12 years of clinical diagnostic experience in molecular and serology testing. Dr Ching received his PhD in chemical pathology from the Chinese University of Hong Kong and has more than 15 years of experience in the practical application of molecular and serology tests. Miss Chu achieved her Masters in Biochemistry from the Chinese University of Hong Kong and has 15 years' of experience in molecular test development and application. All the team hold the Medical Laboratory Technologist Part I license and are able to readily perform and trouble shoot routine molecular and serology tests while also able to completely develop novel tests if required.

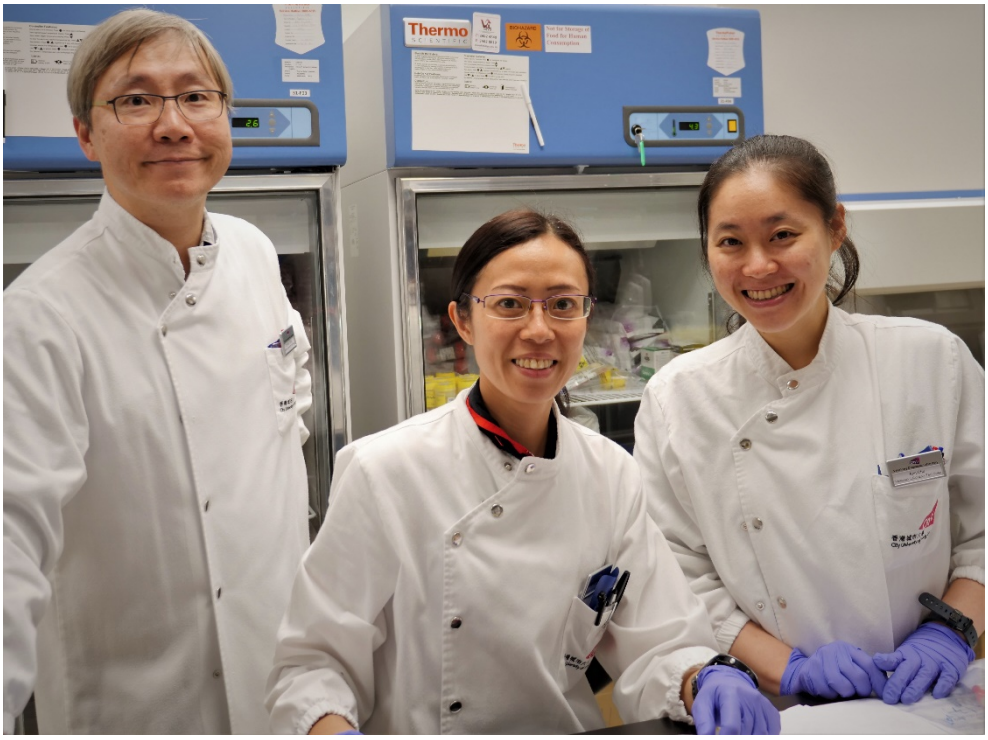


Figure 4:The CityU VDL molecular and serology team includes Dr Arthur Ching (left), Dr Christina To (centre) and Miss Lai On Chu (right)

To contact our veterinary staff, call 3442-4849 and ask to be connected, or email:

## Pathologists

Dr Jeanine Sandy

Email: j.sandy@cityu.edu.hk

Dr Andrew Ferguson

Email: andrew.ferguson@cityu.edu.hk

Dr May Tse

Email: maypy.tse@cityu.edu.hk

Dr Fraser Hill

Email: fraser.hill@cityu.edu.hk

Dr Daniela Hernandez Muguiro

Email Daniela.hernandez@cityu.edu.hk

Dr Steve Mills

Email: infovdl@cityu.edu.hk

## Microbiology Veterinarian

Dr Vidya Bhardwaj

Email: bhardwaj.vidya@cityu.edu.hk

## Contact Us

**Phone: (852) 3442-4849**
(For specimen pickups, consumable purchases, submission forms, specimen bags, and pricelist request)

**Fax: (852) 3442-0819**

**Email: infovdl@cityu.edu.hk**

**Address:**
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**City University of Hong Kong**
**83 Tat Chee Avenue**
**Kowloon, Hong Kong**

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