

CRITTERS'S

*all
Critters
Great & Small*

SUMMER
2019



BMS study tour
to **Japan**

CityU Veterinary Medical Centre
opens for business

Production of High Quality
**Warm-water Marine
Fish Larvae**

CityU



Jockey Club College of Veterinary
Medicine and Life Sciences

香港城市大學
City University of Hong Kong
in collaboration with Cornell University



DEAN'S MESSAGE

院長的話

Veni, vidi, vici –

So they came, they saw and they liked it (taking a bit of literary licence on the Latin phrase) – earlier this year, we hosted our latest accreditation visit from the Australasian Veterinary Boards Council (AVBC), headed this time by Emeritus Professor Tim Parkinson from Massey University, New Zealand.

Over a period of a week, the team explored every nook and cranny of our developing veterinary programme, visited CityU's educational facilities Hong Kong-wide and have now delivered their verdict – they liked what they saw, and haven't given us ticks for all twelve standards (and 5 commendations for things particularly well done). As always, there are also suggestions for improvements too, so more work to do.

Accreditation visits are part of the ongoing quality assurance system provided to an internationally accredited school; this most recent visit was jointly conducted by the AVBC with the Royal College of Veterinary Surgeons (London) (RCVS), the body that governs the accreditation for UK-based veterinary schools. Thus, the 2019 visiting team not only had senior veterinary academics from Massey, Melbourne, Sydney and Brisbane amongst them, but also Prof Malcolm Bennett from the University of Nottingham, acting as the RCVS observer.

This was not just an exercise completed over the course of a week – at least half a year's planning goes into the preparation of the visit, including the writing of a very detailed Self-Evaluation report that CityU had to furnish to the AVBC two months prior to the visit, and also a lot of report writing, and responses from CityU in the two months after the visit.

Now however, the AVBC Board and the RCVS' Committee of Education have signed off on our visit report and agreed to continue our standing with "Provisional accreditation". There will be another visit in about two years' time, to assure them (and us) that we are still on the right track, as our first cohort of students enters the more clinical years of their education.

So more work to be done, but well done to everybody at the Jockey Club College of Veterinary Medicine and Life Sciences for continuing to do such a great job.

Professor Michael P. Reichel
Dean

他們來、他們見、他們滿意

有一句著名拉丁文捷報：「我來、我見、我征服。」今天輪到我們報捷：「他們來、他們見、他們滿意。」今年初，由新西蘭梅西大學榮譽教授 Tim Parkinson 帶領的澳新獸醫管理局理事會代表團，來到城大校園進行最新一次認證考察。

在為期一周的認證考察中，他們深入考察我們日漸成熟的獸醫課程，參觀城大遍布香港各處的教學設施，最終得出一個結論——他們對看到的感到滿意，我們 12 個項目全部獲評為表現達標，其中 5 項更獲讚許。

認證考察是任何國際認可的獸醫學院均要持續進行的其中一項品質保證系統活動。主持這次認證考察的除了澳新獸醫管理局理事會外，還有負責認可所有英國獸醫學院的英國皇家獸醫學院。因此，2019 年考察團不單有來自梅西、墨爾本、悉尼和布里斯本的資深獸醫學者，還有英國皇家獸醫學院觀察員、來自諾定咸大學的 Malcolm Bennett 教授。

其實這次成果絕非只是一星期的工作，之前我們花了半年時間準備。城大要在考察團到訪前兩個月，向澳新獸醫管理局理事會遞交一份鉅細無遺的自我評估報告，並在考察團離開後兩個月之內，就考察的評估遞交回應。

如今，澳新獸醫管理局理事會的董事局及英國皇家獸醫學院的教育委員會已通過我們的考察報告，同意繼續給予我們臨時認證資格。他們會在兩年後進行另一次考察，確保我們的獸醫課程如期發展，到時我們第一批學生已開始臨床實習了。

因此，我們仍有漫漫長路，感謝賽馬會動物醫學及生命科學學院全人孜孜不倦，達到如此驕人成績！

院長
禮哲教授

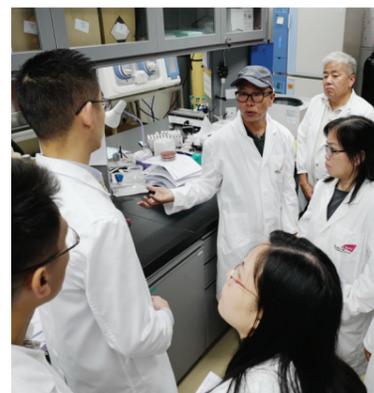


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CityU Veterinary Medical Centre opens 城大動物醫療中心投入運作





The CityU Veterinary Medical Centre (CityU VMC), (formerly known as CityU Peace Avenue Veterinary Clinic (PAVC)), one of the largest veterinary clinics in Asia, opened its doors in April 2019 and will service the public as well as provide medical cases for studies and practicum opportunities for students at the Jockey Club College of Veterinary Medicine and Life Sciences at City University of Hong Kong (CityU).

Amongst the VIPs attending the opening ceremony, were Dr Eugene Chan Kin-keung, Ms Lilian Chiang Sui-fook, and Miss Lo Po-man, members of CityU Council; Dr Lo Wai-kiwok, Member of the Legislative Council and Director of CityU Veterinary Health Group; Dr William Ho, JP, Chairman of the CityU Veterinary Hospital and Diagnostic Laboratory Advisory Committee; as well as other good friends, supporters and stakeholders of CityU's JCC.

Addressing the opening ceremony for the Centre on 27 March, Professor Way Kuo, CityU President, thanked the University and the CityU VMC team for dedicated efforts.

“It takes ten years to forge a sword,” he said. “I’m proud of our team, as the Centre is just like a sharp sword.”

Mr Lau Ming-wai, Chairman of the CityU Veterinary Health Group Board of Directors, said the Centre would boost the aspirations of the College. “Veterinary medicine is not only concerned about caring for pets but also public health. I hope that the Centre will take on a leadership role in this regard.”

Dr Duncan Hockley, Executive Director for CityU Veterinary Health Group and CityU Veterinary Diagnostic Laboratory, said the Centre would strive to become a centre of excellence in Hong Kong and Asia as well as the world. “Our team of veterinarians and support staff is committed to setting a standard of excellence for veterinary science and patient care,” he said.

With a floor area of approximately 33,000 square feet, the three-storey centre is equipped with a first-of-its-kind in Hong Kong intensive care unit for animals, a cardiology suite, 22 consultation rooms, nine dedicated operating theatres, and 24/7 emergency services manned by emergency veterinarians.

In addition to its primary veterinary services, the Centre has the biggest veterinary specialist team in Hong Kong. The team provides specialist veterinary services in eight areas: surgery, anaesthesiology, neurology, dermatology, cardiology, ophthalmology, internal medicine, and emergency and critical care. In the future, it will also offer oncology services.

The Centre is equipped with state-of-the-art equipment for diagnosis and treatment, including a new 64-slice CT scanner, a 1.5 Tesla MRI, multiple complete digital radiography units ultrasound, colour doppler echocardiography, intra-operative fluoroscopy and endoscopy.

As part of its community outreach, the Centre will collaborate with the Caritas’ Gato Home Project to provide free physical examinations and treatment for cats participating in the project. In addition, it will work with the Make-A-Wish Hong Kong, a charity organisation, to arrange activities for the “A Real Vet For A Day” programme for infirmed children. It will also supports the Spay Neuter Assistance Programme of the Society for the Protection of Cruelty to Animals.

東南亞其中一間最具規模的動物醫療機構「城大動物醫療中心」(前身為城大太平道動物診所)已於4月3日投入運作,除了為廣大市民提供服務外,亦將為香港城市大學(城大)賽馬會動物醫學及生命科學院的專家提供動物患病案例及為修讀相關課程的學生提供實習機會。

開幕禮當日出席的嘉賓包括城大校董陳建強博士、蔣瑞福女士及羅寶文小姐、城大動物醫療有限公司董事兼立法會議員盧偉國博士、城大動物醫院及化驗所顧問委員會主席何兆煒醫生、多位支持城大發展的友好、持份者及城大管理層。

城大校長郭位教授致詞時感謝城大及中心團隊的貢獻。他說：「『十年磨一劍』，這把劍很鋒利，我為我們的團隊感到自豪。」

城大動物醫療有限公司董事會主席劉鳴煒先生稱，中心將進一步支持動物醫學及生命科學院施展抱負，「動物醫學不限於照顧寵物，還關乎公共衛生。我期望中心將擔當領導角色。」

城大動物醫療有限公司及城大動物醫療檢驗有限公司執行董事 Duncan Hockley 獸醫指，動物醫療中心將致力追求卓越，成為香港、亞洲區以至全球的優秀動物診所，「獸醫和支援人員組成的團隊，矢志為動物醫學及動物護理定下卓越標準。」

城大動物醫療中心實用面積達3.3萬平方呎，佔地三層，設有全港首個動物深切治療部、心臟專科中心、22間診症室、9間手術室，及由註冊急症科專科獸醫管理、提供全年無休的24小時急症服務。

該中心除了提供專業的全科獸醫診治外，亦擁有全港最龐大的專科獸醫團隊，涵蓋八大專科領域，包括：外科、麻醉科、神經內科、皮膚科、心臟科、眼科、內科，與急症及深切治療科，中心日後亦將開設腫瘤專科。

中心配備先進的影像診斷及治療設備，包括：1.5 Tesla 磁力共振掃描、全新64切面電腦斷層掃描儀，及進行全數位放射掃描、超聲波、彩色超音波回音心電圖、手術中透視掃描及內窺鏡檢查等的儀器。

此外，該中心以推動動物福利及企業責任為核心使命之一。中心將為「明愛貓空動物輔助治療戒毒和康復計劃」的貓提供免費身體檢查及治療；又會與「願望成真基金」合作，為病童舉辦「當一天獸醫」活動，及支援香港愛護動物協會的「動物絕育資助計劃」。



Study Tour to Sysmex Corporation, Kobe, Japan

A group of 12 Biomedical Sciences (BMS) students visited Kobe, Japan for a wonderful study tour and a visit to Sysmex Corporation in the Summer of 2019. Sysmex Corporation is an international company, engaged in healthcare and medical diagnostics business, and headquartered in Kobe, Japan. Sysmex holds the No.1 share of the global market in the haematology field and their businesses include research and development, manufacture and sales of clinical diagnostic instruments, reagents and related software. Apart from their core businesses, Sysmex also provides opportunities and resources to encourage researchers and engineers to have an interdisciplinary and cross-sectional collaborations.

Visiting the production area in 'I-square' of Sysmex, provided an opportunity for our BMS students to observe how different clinical analyzers (commonly found in hospitals and medical laboratories worldwide) are systematically and accurately developed. In addition, we had the chance to meet with the Director of Sysmex, Ms. Fumiko Iwasa, who shared some of her valuable experiences in the management of an international medical diagnostics devices company. Also, the laboratory for reagent manufacture gave our BMS students an opportunity to understand

how a manufacture ensures that their reagents are standardized for world-wide use.

In the solution centre of Sysmex, our BMS students saw how Sysmex provides regional offsite technical support services to solve any emergencies in the medical laboratory via a real-time online solution platform. Furthermore, there was a showroom demonstrating different generations of haematological analyzers that introduced the evolution and progress of haematological techniques to our BMS students. An automated analyzer's track system, analyzers for immunology, urology and oncology also caught our students' attention about the future development of medical diagnostic analyzers. This out-of-lecture room experience was an exceptional opportunity for our BMS students to understand more about the medical diagnostics field and explore different opportunities in biomedical sciences.



參觀日本神戶 Sysmex 公司

今年暑假，BMS 有 12 名同學參加了日本神戶遊學團，並且探訪了 Sysmex Corporation。

Sysmex Corporation 是一家國際公司，從事醫療保健和醫療診斷業務，總部位於日本神戶。Sysmex 在血液學領域的市場份額佔全球第一，其業務包括臨床診斷儀器，以及試劑和相關軟件的研發、製造和銷售。在業務以外，Sysmex 還提供機會和資源，鼓勵研究人員和工程師進行跨學科和跨部門的合作。

訪問 Sysmex 的「I-square」生產區時，BMS 學生有機會觀察到系統化和準確地開發各種臨床分析儀（世界各地的醫院和醫學實驗室中常見）的過程。此外，我們還有機會與 Sysmex 主任 Fumiko Iwasa 女士會面，她與 BMS 學生分享了她管理國際性醫療診斷設備公司的寶貴經驗。此外，參觀試劑製造實驗室，也使 BMS 學生了解到製造商如何將其試劑標準化，以供全世界使用。

在 Sysmex 的解決方案中心，BMS 學生也了解到該公司如何通過實時在線解決方案平台提供區域性異地技術支持服務，以解決醫學實驗室中的任何問題。此外，還有一個展示不同代血液分析儀的陳列室，工作人員向我們介紹了血液學技術的進化過程。自動分析儀的跟踪系統、免疫學、泌尿學和腫瘤學分析儀也令學生關注到醫學診斷分析儀的未來發展。這種課室以外的經歷，讓 BMS 學生有難得的機會，更深入了解醫學診斷領域，並探索生物醫學科學中的不同機會。



JCC research projects secure \$35 million from the Sustainable Agriculture and Fisheries Development Fund

The College has recently been granted \$35 million in funding by Agriculture, Fisheries and Conservation Department (AFCD), for three research projects to enhance sustainability of local pig farms, poultry farms and fisheries, as well as improving their health and production.

Professor Dirk Pfeiffer, Chow Tak Fung Chair Professor of One Health and Associate Dean (Research) of JCC, is leading two 2-year research projects - "Improving Pig Health and Production in Hong Kong" and "Improving Poultry Health and Production in Hong Kong." Each project was granted HK\$15 million by the Sustainable Agriculture Development Fund. The 2-year research project "Improving Fish Health and Production in Hong Kong"- led by Professor Sophie St-Hilaire, secured HK\$5 million from the Sustainable Fisheries Development Fund.

"Our Chief Executive promised in her first Policy Address that the government would support the development of livestock and fish farms in Hong Kong, as well as enhancing the food safety of local agricultural and fisheries products. We are supporting that aim through our research projects which will combine veterinary service delivery to these industries which research to ensure animal health and food safety for Hong Kong's citizens," said Professor Pfeiffer.

JCC will employ dedicated veterinarians for both the "Improving Pig Health and Production in Hong Kong" and "Improving Poultry Health and Production in Hong Kong" projects. They will work with the 43 pig and 28 poultry farmers in Hong Kong and assist to reduce production losses, and thereby improve profitability, while reducing the risk of infectious diseases spread and the need for usage of antimicrobials.

Having had the first avian outbreaks with human fatalities in 1997, then having been affected by SARS in 2003, Hong Kong is now exposed to the African swine fever epidemic currently spreading across Mainland China. While this infectious disease does not affect humans, it causes high mortality in pigs, and thereby results in increased price of pork. Professor Pfeiffer also said that Hong Kong's hot and humid climate represents a significant challenge for the health and well-being of local and imported pigs, and to a lesser extent for poultry. Furthermore there is a tendency to keep large numbers of pigs or poultry on farms, which increases the risk for the spread of infectious diseases. His team aims to facilitate the development of modern and sustainable pig and poultry production through which to enhance the overall competitiveness of local meat producing industry.

With limited access to veterinary services, pig and poultry farms may be using the wrong antibiotics or use the correct ones inappropriately, which may result in these antibiotics becoming ineffective for treating infectious diseases in animals and humans. His team will provide a tailored health and production management programme and free clinical veterinary services tailored to the particular needs of each farm. "Our goals are to improve farm productivity, animal welfare and food safety, and to prevent the emergence of zoonotic diseases," he said.

Mr Chan Kin Yip, Chairman of the Federation of Hong Kong Agricultural Association said, "We used to rely on our own experience to cope with the health problems of our farm animals as there was limited veterinary advice available. I am therefore encouraged and hope that we can benefit from this new programme provided by CityU vet school.

The other project, "Improving Fish Health and Production in Hong Kong", provides veterinary diagnosis and disease prevention services to 945 marine fish culture and 332 pond fish culture, and assists them to tackle problems such as pathogens, parasites and harmful algal blooms (commonly referred to as red tides). This research project offers on-site veterinary services in support of the AFCD's Health Inspection Programme involving regular visits to farms and monitoring the occurrence of different fish diseases.

This research project also aims to train local veterinarians by offering fisheries internships for Bachelor of Veterinary Medicine students. "Through providing veterinary services and upgrading industry expertise, we are helping to enhance the sustainability of local aquaculture and make it a high value-added industry," said Professor St-Hilaire.

賽馬會動物醫學及生命科學院研究項目獲農業及漁業持續發展基金撥款 3500 萬

賽馬會動物醫學及生命科學院三個研究項目，獲漁農自然護理署撥款近 3500 萬港元，資助其研究改善豬隻、家禽及魚類的健康及生產的方法，並促進本地養豬業、家禽業及水產養殖業的可持續發展。

城大賽馬會動物醫學及生命科學院副院長（研究）兼周德豐健康一體化講座教授 Dirk Pfeiffer 教授的兩個研究項目各為期兩年，題目分別為「改善香港豬隻健康及生產」及「改善香港家禽健康及生產」，各獲農業持續發展基金撥款 1500 萬港元。而沈藹莉教授領導為期兩年的「改善香港的魚類健康和生產」研究，則獲漁業持續發展基金撥款 500 萬港元。

Pfeiffer 教授說：「現任行政長官在首份《施政報告》提及協助香港的禽畜農場及魚類養殖場發展，並提升本地漁農產品的食物安全。我們全力支持這些目標，會向業界提供以研究為基礎的獸醫服務，以確保動物健康及本港市民的食物安全。」

城大賽馬會動物醫學及生命科學院會為「改善香港豬隻健康及生產」及「改善香港家禽健康及生產」兩個研究項目聘請專責獸醫。他們會跟 43 位養豬戶及 28 位養家禽戶合作，協助他們減少生產損失，改善盈利能力，並降低傳染病風險及抗生素用量。

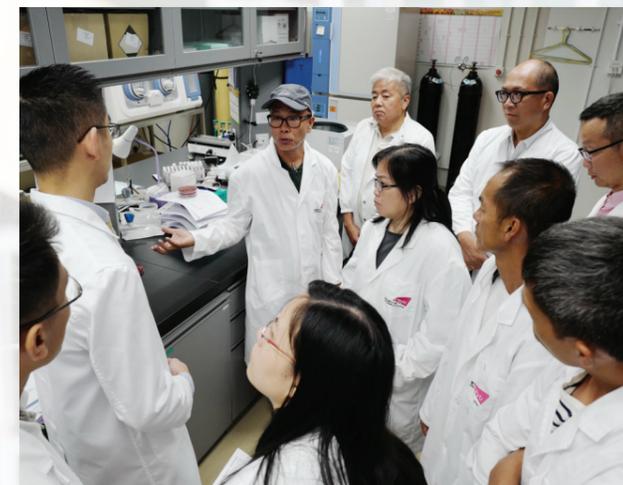
1997 年，禽流感奪去市民生命；2003 年，沙士肆虐這個城市。今天，香港再受正在蔓延中國內地的非洲豬瘟威脅。雖然非洲豬瘟不會傳染人類，卻造成豬隻大量死亡，令豬肉價格急升。Pfeiffer 教授又指，香港的潮濕炎熱天氣最易影響本地及入口豬隻的健康情況，也有一定程度影響家禽。而且，豬場及家禽場的環境密集，更易感染傳播病。團隊的目標是令本地豬隻及家禽生產更現代及可持續發展，從而提升本地肉食製造業的整體競爭力。

此外，由於這些農場只得到有限的獸醫服務，所以有可能選用了錯誤的抗生素，或選擇正確但用藥方法錯誤，故無法治療動物和人類傳染病。他的團隊將為農場度身制訂衛生及生產管理計劃，並按個別需要提供免費臨床獸醫服務，他說：「我們的目標是改善農場生產力、動物福利、食物安全及預防新興人畜共患病。」

香港農業聯合會主席陳建業先生說：「一直以來，我們只能靠自己的經驗去處理動物的健康問題，因為相關的獸醫服務有限。因此，我對城大的新計劃感到鼓舞，希望能令業界受惠。」

至於另一項研究項目「改善香港的魚類健康和生產」，則向全港 945 個海魚養殖場及 332 個塘魚養殖場提供獸醫診治及疾病預防服務，協助養魚戶解決病原菌、寄生蟲及有害藻華（俗稱紅潮）等問題。該研究項目支援漁農自然護理署的定期巡查魚場及追蹤魚病的「魚類健康檢查計劃」。

這些項目的另一宗旨是為香港培訓相關獸醫，讓城大獸醫學士課程學生在相關農場實習，沈藹莉教授說：「我們一方面為養魚戶提供獸醫服務，另一方面提升他們的專業知識，從而促進本地水產養殖業持續發展，發展成高增值產業。」



Mucking, lambing,
trimming, feeding...

*students take on large farm
animals at Cornell*





Even a sheep needs a manicure or pedicure once in a while, and Samantha and Tiffany are only too happy to oblige.

綿羊間中也要修甲，Samantha 和 Tiffany 樂意效勞。



Steady as they go, Ying and Tiffany sheepishly try their hands at an artificial lambing stimulation.

Ying 和 Tiffany 以綿羊模型學習接生，手法純熟。



Erm...being a student vet is not all glam, as Erin discovers. It also involves muck, mud and lots of sweat.

Erin 發現獸醫學生生活多姿多采，但有時要一身泥濘、大汗淋漓。



Cornell supervisors ready to jump in to lend a hand to Erin as she turns "vampire" on a horse. Can't afford to be squeamish when drawing blood...it's all part of the game.

Erin 為馬抽血時很拘謹，康奈爾大學導師準備伸出援手，抽血工作也是樂趣之一。

If a picture could paint a thousand words...well, so could a photo.

Below are photos revealing how our first-year vet students spent a remarkable five-week stint at Cornell University in Ithaca, New York, in June 2019. The trip was part of the Jockey Club College of Veterinary Medicine and Life Sciences of City University's extramural studies (EMS) programme - a very crucial component for aspiring vets.

During the trip, the students received a series of lectures on farming methodology. They also learnt how large farms and animal facilities are run, how

to differentiate breeds of animals, observe animal behaviour and how to restraint and handle large animals such as sheep, cattle and horses.

Another memorable experience was the placement at the Equine and Nemo Farm Animal Hospital where the undergrads shadowed vets and observed surgeries.

It was not all study and no play - they also took part in outdoor team-building exercises which included zip-lining, treetop rope-walking as well as hiking blindfolded through the forest. At the weekends, they went on guided tours to local farms and ice cream and cheese-making facilities.

Karen Hirsch, one of the Cornell supervisors, says she was impressed with this crop of students. "I found them to be fully involved with whatever was going on. They were exceedingly helpful in every situation, whether animal-related or socially-oriented. And of course, they were always respectful and polite."

Dr Catherine Anne Cormack, the extra-mural study coordinator of City University Jockey Club College of Veterinary Medicine and Life Sciences, adds: "The Cornell trip was a fantastic learning opportunity for the students, not only to gain experience working with species they have not encountered before but it gave them the opportunity to travel to a new country and experience a new culture."

EMS placements give students the opportunities to observe different animal practices, gain valuable experience, build up confidence and improve communication skills. The experience they get from EMS is so varied that once they become fully-fledged veterinarians, it is hoped they will get off to a brisk and successful start as a duck takes to water.



"Whoa there, girl, we ain't gonna hurt you." Felix and Tiffany try to befriend and calm down a sheep.

「小女孩，別怕，我們不會傷害你。」Felix 與 Tiffany 嘗試跟綿羊交好，讓牠冷靜。



There is nothing more amazing than walking a horse, in all its splendour, out of its trailer as Desiree finds out.

Desiree 跟駿馬從組合屋走出來，才知感覺這般美妙。



Students Hannah, Martin, Yen and Margarita at the ready to soak up lessons on how to milk a dairy cow. A definite hands-on experience...

Hannah、Martin、Yen 和 Margarita 四位學生學習為乳牛擠奶，絕對是最親身的體驗。



A collective sigh of "awwww..." permeates the air as students look on with fascination as a cute calf is bottle-fed. Feeding calves is one of the highlights of the Cornell EMS trip.

學生們為可愛小牛餵奶樽，讚歎聲此起彼落，餵小羊是康奈爾校外課程的重點之一。

Desiree Hung

What surprised you the most at Cornell?

The thing that surprised me the most was how much we were exposed to during the Cornell trip. At first, we were told that this trip would be about animal husbandry and we didn't expect that we would also be working with vets, especially in the large animal hospitals, and seeing how a hospital really works every single day or how surgeries are performed or how internal medicine works.

What have you learnt about the veterinary profession during the is trip?

I learnt that vets need to be very creative. When I was attached to the hospital, there was a cow which had a very sore leg and they had to make a splint for her. Since there were no splints that fitted her hoof size, the vet had to make one using plaster cast. I thought it was really creative. It was really amazing to see how creative and how funny it can be working as a vet with large animals.

你在康奈爾大學最意想不到的是甚麼？

我在這個康奈爾旅程獲益之多，實在令我意想不到。首先，我們知道這個校外課程跟畜牧業有關，但沒有預料還可以與獸醫一同工作，尤其見證大動物醫院的日常運作，可以觀察獸醫如何做手術及診症。

你在這個校外課程獲得甚麼獸醫體驗？

我明白到獸醫要有創意，當我駐守醫院時，一隻乳牛的腿很痛，獸醫要為牠預備一塊夾板，但醫院裏的夾板都不合牠的蹄型，只好用石膏為牠度身訂造夾板，我覺得這個方法很有創意。大動物獸醫既有創意又風趣，令我大開眼界。

Samantha Lie Shu Yin

What was the most enjoyable part of our Cornell EMS experience?

The most enjoyable part is being able to be with animals all the time and being able to have hands-on and practical experiences with them.

What surprised you the most at Cornell ?

The amount of physical labour that goes into pushing or moving sheep. I never knew this before this trip.

你最喜歡康奈爾大學校外課程甚麼？

我最享受可以經常跟動物相處，獲得親身體驗和實用經驗。

你在康奈爾最意想不到的是甚麼？

我在這個旅程之前，不知道原來趕羊需要這麼多人手。

Martin Lee Sze ming

What species did you most enjoy working with during Cornell EMS?

I like horses a lot. Even before I came to Cornell, I already liked horses.

What have you learnt about the veterinary profession during Cornell EMS?

Most of the people I met within the veterinary profession have one species that they really like a lot and have said they would like to work with that type of animal for the rest of their career.

你在康奈爾大學最喜歡照顧哪種動物？

我很喜歡馬，其實我來康奈爾大學之前，本來就很喜歡馬。

你在這個校外課程獲得甚麼獸醫體驗？

我遇到的獸醫大多對某一種動物情有獨鍾，還說整個獸醫生涯都要照顧這種動物。

Png Yen

What was the most enjoyable part of our Cornell EMS experience?

I've never been around big animals and in many ways, they really surprised me. They are lots of examples on how they treat the animals. We have small animals and some wild buffaloes in Hong Kong but we don't really have large animals. Everything we had done there was new and really, really nice and enjoyable and people there have made it even better.

What species did you most enjoy working with during Cornell EMS?

Horses...which is kind of funny since I've had experiences being around horses in Hong Kong but then, the horses here gave me a very different exposure, a very different experience. I really like the horses here, I would say.

你最喜歡康奈爾大學校外課程甚麼？

我從未這麼接近大動物，令我十分驚喜，他們會示範如何對待這些動物。雖然香港有小動物和野水牛，但我們沒有甚麼大動物，一事一物都很新鮮奇妙，當地的人令我們更加享受。

你在康奈爾大學最喜歡照顧哪種動物？

馬……有趣的是，我在香港也會接近馬，但康奈爾的馬給我不同感受，只能說我真的很喜歡當地的馬。

Felix Yau Tin Hang

What species did you most enjoy working with during Cornell EMS?

I enjoyed working with sheep the most because they are so curious. Despite being large they're still controllable and I really like them.

What have you learnt about the veterinary profession during Cornell EMS?

We got to see how people worked in a hospital setting and it's just so amazing to see how different personalities like vets, vet technicians, radiologists and anaesthesiologists working well together. It made me realise that veterinary medicine is a career where not only are you working with animals, but you also have to get along with people.

你最喜歡康奈爾大學校外課程的甚麼？

我最享受在馬術學校和 Nemo 農莊動物醫院工作。香港沒有大動物醫院，難以獲得臨床親身經驗，即使有些人得到臨床經驗，也只能在小動物醫院工作，因此我很享受駐守大動物醫院。

你在這個校外課程獲得甚麼獸醫體驗？

我們可以觀察醫院的工作情況，見識獸醫、獸醫技術員、放射治療師和麻醉師不同崗位的人如何合作無間，令我明白獸醫這門專業不單要跟動物相處，也要跟眾人合作。

康奈爾大動物農場 學生餵飼、剪毛與接生

一支畫筆可以繪出千言萬語，其實一幀相片也有這種魔法。

2019年6月，我們的獸醫學學士一年級學生遠赴位於美國伊薩卡的康奈爾大學，這些照片展示他們這五個星期的快樂旅程。這是賽馬會動物醫學及生命科學院校外課程之一，矢志為社會培訓獸醫。

在這個旅程中，學生出席多個關於農業方法的講座，學習管理大動物農場及動物設施、分辨不同動物品種、觀察動物行為，以及控制和處理綿羊、牛和馬等大動物。

這些學生另一個難忘經歷，是在馬術中心及 Nemo 農莊動物醫院協助獸醫，觀察手術過程。

這個旅程也不只要求苦讀，學生可以參加戶外活動，建立團體精神，這些活動包括鋼索飛行、沿樹頂的繩索步行、帶眼罩穿越森林。每逢周末，他們跟導遊參觀當地農莊，以及雪糕和芝士製造工場。



康奈爾導師之一 Karen Hirsch 對這屆學生印象深刻：「他們對所有活動全情投入，不管是關於動物的，或是社交場合，他們十分踴躍幫忙，總是待人有禮。」

城大賽馬會動物醫學及生命科學院校外課程統籌員 Catherine Anne Cornack 獸醫補充：「康奈爾旅程的學習機會十分美妙，學生不單可以接觸自己從未接觸過的動物，還有機會探訪從未踏足的國家，體驗新的文化。」

這些校外課程給學生不同的機會，觀察處理動物的方法，獲得寶貴經驗、建立個人自信和改變溝通技巧。這些學生在校外課程各有得着，期望他們正式成為獸醫時，可以立即大展拳腳，一顯身手。



“To be or not to be” - accredited



International accreditation of veterinary schools is a pre-requisite for registration as a veterinarian in most developed countries. Accreditation of the programme allows a graduate to work in other jurisdictions which recognise that standard to work without further examination.

In Hong Kong, only graduates from veterinary schools that are either accredited by the Australasian Veterinary Boards Council (AVBC), the Royal College of Veterinary Surgeons (London) (RCVS) or the American Veterinary Medical Association (AVMA) will soon be the only ones admissible for registration by the HK Veterinary Surgeons Board.



The standards that these three bodies set are very high and fundamentally similar – they essentially aim to make the graduate practice-ready, and competent to practice veterinary medicine in their own right on Day 1 after graduation (Day 1 competencies). The three

accreditation bodies align their standards by meeting regularly in the International Accreditors Working Group (IAWG) and by performing joint accreditation visits.

The visitation itself may only last a week, but it usually takes a year to fully plan and culminates in a team of usually eight senior academics from other schools visiting. This team assesses the programme against 12 standards (in the case of the AVMA it is 11 covering the same range) that look at the overall organisation, the finances, the facilities etc. – a checklist of hundreds of items is worked through by the visitors over the week-long visitation. The school also prepares its own Self-evaluation report, a 100-page document that demonstrates how the school thinks it is addressing these standards.

This AVBC and RCVS are also linked by a mutual recognition arrangement, which means that schools accredited by either party are also acceptable to the other. Hence graduates from AVBC-accredited schools can readily work in the UK, and vice versa. The South African Veterinary Council has a separate recognition agreement for AVBC-accredited schools, meaning AVBC-accredited school graduates can work in South Africa as well, without further examination.

The accreditation process offered by the AVBC allows for a process of ongoing engagement with the developing veterinary programme, on-going quality assurance that is both useful for the school (they learn what they are doing well, and where they can improve) and the accreditation body (as they can have valuable input into the programme at an early stage, and help to achieve the outcomes required). The AVBC also offers an early check-up on the intentions of a university to setup a veterinary programme, and can approve these plans in principle



– and issue a “Letter of Reasonable Assurance” that the programme, facilities and other plans appear to be designed to achieve the desired outcomes.

The Bachelor of Veterinary Medicine (BVM) at City University of Hong Kong has been engaged with the AVBC and RCVS for a period of almost 5 years now, and has received 3 visits during that time.

It was first given a “Letter of Reasonable Assurance” in March 2017, before the first intake of students in September that year, and is now provisionally accredited, with the last visit completed in February 2019. That visit reaffirmed the schools status as provisionally accredited, with five commendations, things that the school did particularly well.

This last accreditation visit was conducted jointly by AVBC and RCVS and sets the tone for future joint visits to Hong Kong – full accreditation is expected to be conferred by the AVBC, and also the RCVS when the first cohort of students are expected to graduate in 2023.

衝出國際 全憑認證

在大部分發達國家，要成為註冊獸醫的先決條件是畢業於獲國際認證的獸醫學院，只要學生修畢獲得認證的課程，便能在認證通行的其他司法管轄地區工作，而無需通過其他考核。

在香港，只有獲澳新獸醫管理局理事會 (AVBC)、倫敦皇家獸醫學院 (RCVS) 或美國獸醫學會 (AVMA) 認證的獸醫學院畢業生，才可以成為香港獸醫管理局認可的註冊獸醫。

這三間機構的認證準則相近，同樣嚴格，旨在令畢業生準備就緒，畢業後第一天便能獨立行醫。三間認證機構會定期與國際認證工作小組 (IAWG) 開會，以及進行聯合認證考察，從而調整各自的認證標準。

這些認證考察看似只歷時一星期，其實要花足足一年籌備，8位來自不同院校的資深學者組成的團隊才可以進行考察。該團隊根據 12 項準則審核課程 (美國獸醫學會則以 11 個準則涵蓋相同範疇)，包括機構背景、財政狀況、教研設施等等，並在為期一周的考察期間審核數以百計事項。獸醫學院則要提交 100 頁的自我評估報告，證明如何達到這些準則。

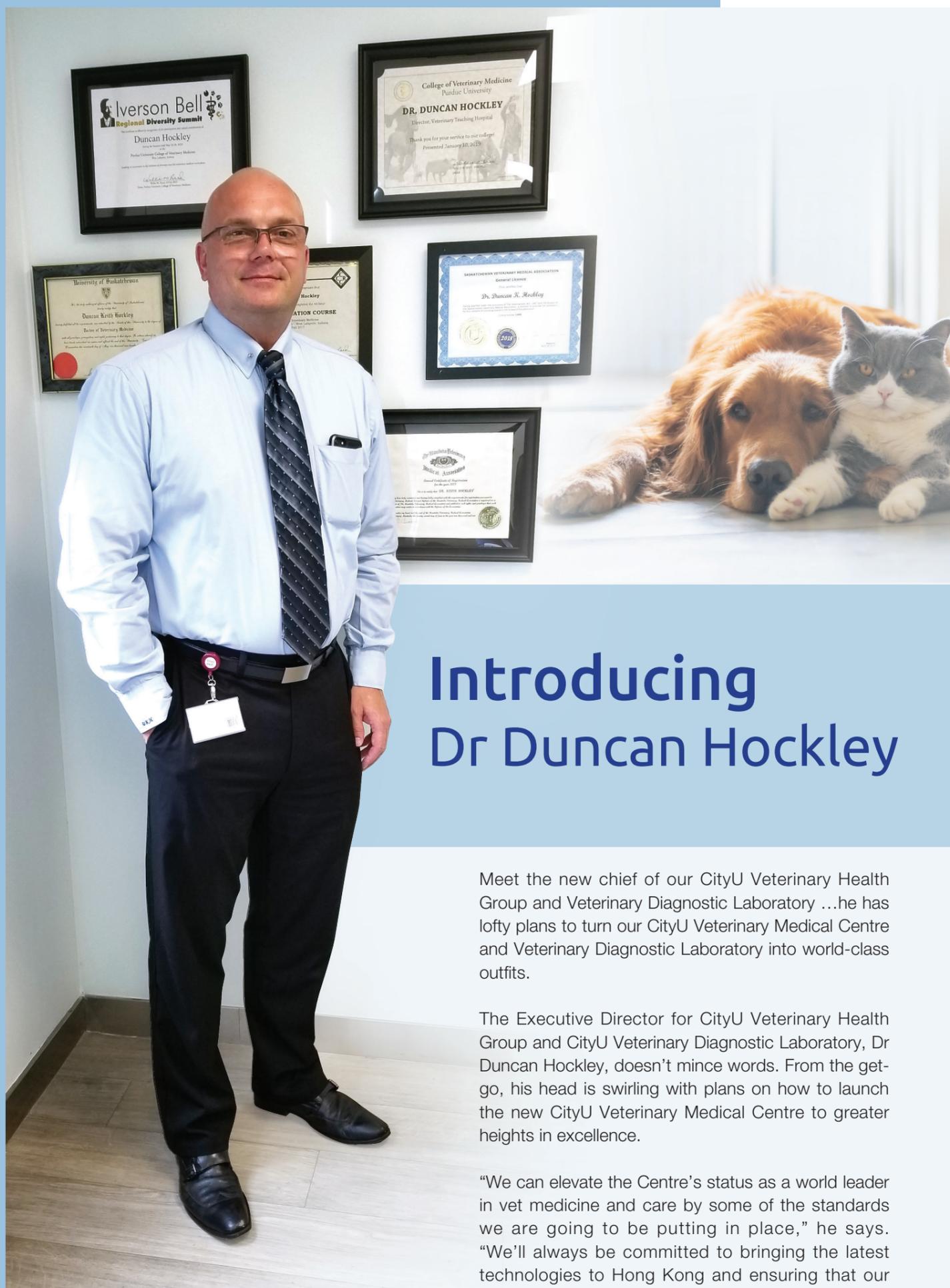
澳新獸醫管理局理事會及倫敦皇家獸醫學院亦有相互認證協議，即獲其中一方認證的獸醫學院，會同時得到另一方的認證，因此，獲澳新獸醫管理局理事會認證的獸醫學院學生，畢業後即時可在英國工作，反之亦然。南非獸醫管理局則與澳新獸醫管理局理事會認證的獸醫學院有另外認可協議，該等獸醫學院畢業生無需通過其他考核便可在南非工作。

澳新獸醫管理局理事會的認證程序不單會與正在發展的獸醫課程保持聯繫，亦會持續確保課程品質，令獸醫學院肯定自己所長之處，同時力求進步，認證機構也可在課程初期已提供寶貴意見，有助最終得到理想結果，因此對雙方皆有裨益。澳新獸醫管理局理事會在初期確保開設獸醫課程的大學符合目標，並根據準則向通過考察的大學發出「合理保證書」，證明該校的獸醫課程、教研設施等計劃表現理想。

在這五年間，香港城市大學獸醫學士課程與澳新獸醫管理局理事會及倫敦皇家獸醫學院交流密切，至今完成了三次認證考察。

2017 年 3 月，城大初次獲發「合理保證書」，同年 9 月錄取第一屆學生。2019 年 2 月，城大完成最近一次認證考察，確定成為獲臨時認證的獸醫學院，並因為在其中五項準則表現卓越，獲考察團體特別讚揚。

澳新獸醫管理局理事會及倫敦皇家獸醫學院完成上一次聯合認證考察後，將會安排下一次聯合考察。2023 年，當第一屆學生畢業時，我們將獲澳新獸醫管理局理事會及倫敦皇家獸醫學院頒發正式認證。



Introducing Dr Duncan Hockley

Meet the new chief of our CityU Veterinary Health Group and Veterinary Diagnostic Laboratory ...he has lofty plans to turn our CityU Veterinary Medical Centre and Veterinary Diagnostic Laboratory into world-class outfits.

The Executive Director for CityU Veterinary Health Group and CityU Veterinary Diagnostic Laboratory, Dr Duncan Hockley, doesn't mince words. From the get-go, his head is swirling with plans on how to launch the new CityU Veterinary Medical Centre to greater heights in excellence.

"We can elevate the Centre's status as a world leader in vet medicine and care by some of the standards we are going to be putting in place," he says. "We'll always be committed to bringing the latest technologies to Hong Kong and ensuring that our

specialists are capable and trained to be doing the latest procedures and diagnostic capabilities. I want us to always be at the forefront of innovation and that is one thing I am committed to," he adds.

He also hopes to introduce telemedicine or satellite clinics across Asia. "That is something we are certainly going to be exploring.

Understanding the business is his business

"I also have a very strong understanding of how we can incorporate providing exposure and support for students in an interactive fast-paced clinical setting. I understand the business model of ensuring we have a sustainable clinic, a sustainable diagnostic laboratory and how we can grow different services across there.

"I can also bring experience about how we can engage with our community for the betterment and welfare of our animals," he says.

Ontario, for five years and was vice president of operations at Pharmathene in Montreal, Quebec, for seven years.

Opportunity to create a legacy

In 2017, Purdue University in Indiana, USA, offered him the position of director of the Veterinary Teaching Hospital and Clinical Associate Professor. A year later, the vet school was ranked number one in North America by the CalPro Research Referring Veterinarian Survey. The national survey evaluates veterinary teaching hospitals on the basis of veterinarians' feedback in relation to responsiveness, communication, client and patient experience as well as the quality of medicine.

So how did Dr Hockley, who was happily ensconced at Purdue University, end up in Hong Kong? "It was rather interesting", he recalls. "It was during Thanksgiving last year and we were sitting around



These are certainly no empty boasts as Dr Hockley, besides being a vet himself, has vast experience running an animal hospital.

After graduating from the University of Saskatchewan, Canada, with a DVM in 1992, he worked as a veterinarian for five years while operating a successful private mixed animal practice. More than two decades later, he was called back by his alma mater to serve as director of the Veterinary Medical Centre at the University of Saskatchewan's Western College of Veterinary Medicine. There, he was responsible for administering the WCVM's veterinary medical facility that serves as Western Canada's referral centre.

Prior to joining WCVM, he held various corporate positions. He was the director of global veterinary services for Bioniche Life Sciences in Belleville,

and talking about Hong Kong because my father-in-law had worked in the city before in the financial world. Then at about 10 pm, I got an email from a headhunter saying... 'we have a position in Hong Kong that you might be interested in'. My wife's immediate response was 'Oh well, we are never going there'.

His wife, a teacher, was hesitant because they had just bought a house, had great jobs and were quite happy there, he says. "However, once we started talking and exploring the opportunity of working in Hong Kong, she became excited about the prospect."

Dr Hockley accepted the challenge because he felt he had the relevant experience that CityU was looking for and saw an opportunity of creating a new legacy. "I was very impressed with the vet school's commitment

towards the profession and I noticed that a lot of efforts were being put towards building a world-class programme. I think that was the determining factor for me.”

One-of-its-kind animal medical centre

The CityU Veterinary Medical Centre opened for business at its new premises in Sham Shui Po in April this year. Located on three floors of the Trinity Towers building, it has a floor area of some 33,000-square-feet. It has a first-of-its-kind intensive care unit, a cardiology suite, 22 consultation rooms, nine operating theatres and around the clock emergency services.

“The design is working very well but there are always little things that we can adjust, for example, redesigning some of the functional teams so that we can be more efficient in what we’re doing,” Dr Hockley says. “We hope to have referral coordinators to better engage with our clients so as to improve the clients’ experience when they come here.”

The new Centre comes with state-of-the-art equipment, among them a 64-slice CT scanner and a 1.5 Tesla MRI machine. “I’m very happy with the investments that CityU has put towards technology. And, as we add new specialties, we will incorporate new specialty equipment as needed.”

As for engaging with the community, the Centre has already begun collaborating with the Caritas’ Gato House Project to provide free physical examinations and treatment of cats. It has also arranged activities for the “A Real Vet For A Day” programme for sick children with the charitable organisation, Make-A-Wish Hong Kong. In addition, the Centre is supporting the Spay Neuter Assistance Programme of the Hong Kong Society for the Protection of Cruelty to Animals.

Opportunities abound for future vets

Any advice for students who are considering becoming a vet? “I think veterinary medicine offers the widest opportunities in one’s career compared to any other profession. I specifically am looking at my career - I went from being a general practitioner to working with the industry and corporate world and then going back to academia. You have such a broad opportunity to do that as a vet.

“I also believe the vet profession will start to emerge through Asia as being a very important profession for the safeguards of animal welfare as well as the safety of the food chain...there is a very important role in the future for veterinarians.”

So while he is putting his plans into action, his wife, his seven-year-old son and two cats - which made the trip all the way from Indiana with the Hockleys - are enjoying themselves in Hong Kong...and not regretting a moment of it.



認識 Duncan Hockley 獸醫

城大動物醫療有限公司及城大動物醫療檢驗有限公司執行董事 Duncan Hockley 獸醫說話從不轉彎抹角，他說自己一早就有很多構思，要令新成立的城大動物醫療中心再創高峰。

「我們要訂立新的標準，令城大動物醫療中心可在世界動物醫療及護理界處於領導地位。」他說：「我們會致力把最新技術帶到香港，專科獸醫服務精益求精，提供最先進的診斷及治療。我們會一直走在創新最前線，這是我對大家的承諾。」

他亦希望將遠程醫療或衛星診所的概念引進亞洲，「這是我們一定會嘗試的事。」

生意之道最緊要

「我深明怎樣在忙碌互動的寵物診所，讓學生獲得經驗和支援，也懂得以什麼營運模式，可令寵物診所和醫療檢驗中心能持續經營、提供多種服務。」

「我的經驗亦可以幫助寵物診所融入社區，改善動物生活福祉。」

Hockley 獸醫絕非空談，因為他不單是獸醫，還有經營寵物診所的豐富經驗。

他於 1992 年在加拿大薩克其萬大學取得獸醫博士學位後，開設了一間私營的大動物與小動物寵物診所，做了五年獸醫，診所經營有道。20 年後，他應母校邀請，擔任薩克其萬大學西部獸醫學院（WCVM）獸醫中心總監，負責管理該學院作為加拿大西部轉介中心的獸醫設施。

他效力西部獸醫學院之前曾任職多家企業，包括在渥太華貝爾維爾的 Bioniche 生命科學公司擔任全球獸醫服務總監 5 年，以及在魁北克省滿地可的 Pharmathene 擔任營運副總裁 7 年。

締造傳奇機會

2017 年，他獲美國印第安納州普渡大學聘任為獸醫教學醫院總監兼臨床助理教授。一年後，該校在「CalPro 研究參考獸醫調查」中高踞北美獸醫教學醫院的榜首，該項全國調查根據獸醫在應診能力、溝通能力、顧客經驗及藥物質素等方面的表現，來評審各家獸醫教學醫院。

在普渡大學生活安定的 Hockley 獸醫，為何決定移居香港呢？「說起來很有趣。」他回憶：「我的外父以前在香港從事金融業，去年感恩節，我們坐着聊起香港的事。那晚 10 點，一間獵頭公司傳來電郵，說：『我們在香港有一個空缺，你也許有興趣。』我的太太立即說：『算了吧，我們一定不會去。』」

任職教師的太太有所保留，是因為他們剛買了房子，工作美好，生活愉快。他回憶：「但我們開始討論，細數香港的工作機會，她開始充滿憧憬。」

Hockley 獸醫知道自己的工作經驗正是城大需要的，亦相信這是一個締造傳奇的機會，因此接受了這項挑戰。「我對城大賽馬會動物醫學及生命科學院的專業宗旨印象深刻，也目睹他們為了開辦世界一流的獸醫課程努力不懈，這是令我作出最後決定的關鍵理由。」

只此一家的動物醫療中心

城大動物醫療中心今年 4 月在深水埗丰匯新址開業，實用面積達 3,300 平方呎，佔地三層，有全港首個動物深切治療部、心臟專科中心、22 間診症室、9 間手術室及 24 小時急症服務。

「我們的設計已經很好，但還是想更盡善盡美，例如會重新規劃一些功能空間，工作起來會更有效率。」Hockley 獸醫說：「我們還想設有轉介統籌員，提升顧客關係和改善服務。」

新中心配備先進設施，包括 64 切面電腦斷層掃描儀、1.5 Telsa 磁力共振掃描，「我很高興城大在科技方面投放了大量資源。我們還會增加專科，並按需要添置新的專科儀器。」

中心亦推動社區融合，與明愛青少年及社區服務「貓空」先導計劃合作，免費為貓隻提供健康檢查及治療服務，亦與慈善團體「願望成真基金」合作，為病童舉辦「當一天獸醫」活動，以及支援香港愛護動物協會的「動物絕育資助計劃」。

未來獸醫的無限機會

對於想做獸醫的學生，他會有何忠告呢？「我認為動物醫學比其他專業有更多工作機會，就以我的事業為例：我最初是全科醫生，再投身企業範疇，又回到學術界，獸醫的出路就是如此廣闊。」

「我也相信獸醫會漸漸成為亞洲十分重要的專業，負責守護動物福利及食物鏈安全……獸醫的地位將會十分重要。」

他坐言起行，從印第安納州移居香港，他的太太、七歲兒子及兩隻小貓也一路追隨，如今大家都很享受香港生活，沒有一點抱怨。



A DAY IN THE LIFE OF... A CANINE AND FELINE PRACTICE SPECIALIST

Jasmine, a little 10-and-half-year-old Maltese, can count herself really lucky that Dr Angel Almendros happened to be on duty when she was taken to the CityU Veterinary Medical Centre in Sham Shui Po for what her owners thought was a skin allergy. However, it turned out to be more sinister than anyone could foresee. Dr Almendros discovered that the skin disease was actually connected to a very rare liver disease in dogs called Hepatocutaneous syndrome. Jasmine's case is the first ever reported in Hong Kong. Worldwide, there are not many cases reported (relatively, maybe about a hundred max). Usually, a patient with the disease would not survive longer than a month or two after diagnosis. However, Jasmine is well and alive today but is being closely monitored and studied by Dr Almendros and his team.

Dr Almendros firmly believes his expertise as a feline and canine specialist helped him to quickly hone into Jasmine's disease. "It appears that all these years of studies have paid off. I was examining the skin of Jasmine and at the same time, I was also diagnosing the liver pathology. So I was able to diagnose this very unusual disease and treat it as well."

Higher level of vet practice

So what is a "canine and feline practice" specialist? "It is a board-certified specialist qualification above that of a normal vet. I would say it is similar to what you have in human medicine...only that you would call them a specialist in family medicine," Dr Almendros explains. "It is a multidisciplinary specialisation, using a holistic approach."

Like any ordinary vet, he sees, consults, treats patients and recommends medications. Sometimes other vets would ask him for his opinion or if the case is more complicated and needs a specific specialist, he would then refer the case to that vet. Otherwise, he would treat the patients himself. "If there are cases with less specific clinical signs, like when a patient is vomiting and coughing or panting and no one knows exactly why, I would conduct an ultrasound, check the heart and do a bit of a general check of everything."

From those tests and analyses, he will be able to find out whether the vomiting is because of a tumour or something else. "If, for instance, a surgery needs to be performed, then I can do it myself but if I think the surgery is going to prove difficult, I will hand it to a specialist in surgery or another specialist."

Vet on the run

Dr Almendros starts his working day very early. Living on Lamma Island meant he has to be up earlier than most. After a quick cup of coffee, he heads to catch the ferry. The 20-something-minute-ride gives him time to reflect on cases, read or simply relax and admire the scenery. On his days off, you would probably see him hiking, cycling, snorkelling or taking advantage of the cultural and culinary repertoire that Hong has to offer.

Dr Almendros arrived in Hong Kong in 2011 but before that, he worked in the UK for eight years. During his holidays he would travel to Asia and volunteer for Vets Without Borders. He has been to Sikkim and Ladakh in India where he neutered animals and performed surgeries. It was during a holiday-slash-volunteer work with Thailand's PhaNgan Animal Care (PAC) that he became interested in Hong Kong after meeting PAC's founder, Dr Shevaun Gallwey.

He was persuaded by Dr Gallwey to accompany her back for a short trip to Hong Kong where she works as a vet. She introduced him to other local vets and, to his surprise, he discovered that most of them were either foreigners or foreign-trained. (City University's Jockey Club College of Veterinary Medicine and Life Sciences had not been established yet.) That trip

kindled some interest in him but it was only six years later that he and his wife - a teacher - finally decided to uproot and move to Hong Kong.

He was much sought-after. He was called for five interviews and all five - including the then named Peace Avenue Veterinary Clinic - offered him a job.

Be prepared for sacrifices

Dr Almendros graduated from the University of Murcia in Spain in 2000 and has vast experience in Clinical Pathology, Diagnostic Imaging, Oncology and Cytology.

It was only late last year that Dr Almendros became a Diplomate of the American Board of Veterinary Practitioners (ABVP) in Canine and Feline Practice and was soon after recognised by the Veterinary Surgeons Board of Hong Kong as a certified specialist.

His advice for anyone interested in becoming a specialist in canine and feline practice: Work hard and be aware of the sacrifices along the way. He recalls that while studying for his ABVP, he would have his notes and laptop practically everywhere he went. "I would sit by the pool in Thailand, for example, and work on my laptop. I would take little breaks, like going for a short swim or have some snacks...and then, it was back to my laptop."

A moment of epiphany

Why a vet? "I had always been interested in medicine," he says. Then something happened on the way to school one day that sealed his career choice. He witnessed a dog get run over by a vehicle and when he saw the animal whimpering in pain, he remembers wishing he could have helped it. It was also at that moment that it dawned on him that looking after animals was what he wanted to do. Fortunately, the accident did not leave him with nightmares but instead, it left him with a strong resolve to become specialist vet who can deliver "superior, comprehensive and multi-disciplinary veterinary service" to his clients.



犬貓科獸醫的忙碌一天

十歲摩天使小狗 Jasmine 算是命大，那天主人以為牠皮膚敏感，把牠帶到深水埗城大動物醫療中心求診，遇上當值的 Angel Almendros 獸醫，其實牠的病情比想像中更加嚴重。Angel 獸醫發現，牠的皮膚病跟一種罕見的狗隻肝病「犬肝炎」有關，是香港首宗同類病例，全球同類病例並不多，最多只有約 100 宗。患者在診斷後通常活不過一、兩個月，但 Jasmine 到今天仍然安好，只是需要 Angel 獸醫及其團隊密切跟進及研究。

Angel 獸醫深信自己的犬貓科專業知識有助了解 Jasmine 的病情，「讀了這麼多年書，真的很有價值，我一邊檢查 Jasmine 的皮膚，一邊研究肝臟病理學，才能診斷出這個罕見疾病，作出適當治療。」

更高層次

甚麼是「犬貓科獸醫」呢？「這是普通獸醫之上的認證專科資格，我會說跟人類醫學相似，像家庭醫科裡的專科醫生一樣。」Angel 解釋：「這是一個跨學科專業，是全面的治療方法。」

他像普通獸醫一樣要接見病者，為牠們診症、治療及開藥，有時要向其他獸醫提供意見，如果某個病例太複雜，他便轉介給專科醫生，否則由他自己處理，「如果某個病例的臨床徵狀不太明確，例如患者嘔吐、咳嗽或氣喘的原因不明，我使用超聲波檢查牠的心臟和做全身檢查。」

憑着這些檢查結果，他得悉患者嘔吐是因為腫瘤或有其他原因，「若要進行手術，我可以自己處理，但如果我認為手術不易，便交由外科醫生或其他專科醫生接手。」

馬不停蹄

Angel 獸醫大清早便開始工作，住在南丫島的他比大部分人都早起，匆匆呷口咖啡便趕去坐船，他會爭取在這 20 分鐘船程思考病例、閱讀、養神或欣賞景色。他放假時會行山、騎單車、浮潛，盡享香港的多元文化和美酒佳餚。

Angel 獸醫在 2011 年移居香港之前，在英國工作 8 年，放假便為「無國界獸醫組織」往亞洲做義工，曾在印度錫金和拉達克為動物絕育及做手術。他在泰國「帕岸島動物護理中心」（PAC）放假做義工時，認識該中心創辦人 Shevaun Gallwey 獸醫，因而對香港產生興趣。

在香港任職獸醫的 Gallwey 獸醫游說他一同前來香港，給他介紹本地的獸醫，他才曉得香港大部分獸醫都是外國人或在外國受訓（當時城大賽馬會動物醫學及生命科學院尚未成立）。這次旅程引起他的興趣，但要等到 6 年後，他才跟當教師的太太決定離開老家，移居香港。

那時他炙手可熱，參加過五次面試，獲得五份聘書，包括城大太平道寵物診所。

不怕犧牲

Angel 獸醫於 2000 年在西班牙莫夕亞大學畢業，於臨床病理學、診斷成像學、腫瘤學和細胞學都有豐富經驗。

他去年底獲得美國獸醫學院專科獸醫（ABVP）犬貓科專科認證，不久獲香港獸醫管理局認證為註冊專科獸醫。

他對有志成為犬貓科專科獸醫的人有一個忠告：努力工作、不怕犧牲。他回憶自己修讀「美國獸醫學院專科獸醫」時，總會隨身攜帶筆記和電腦，「例如我會坐在泰國的泳池邊，對着電腦工作，也許有時游一會水，吃點小食，稍歇一會又重新工作。」

頓悟的時刻

問他為何投身獸醫呢？他答：「我一直對醫科有興趣。」直到某一天，他上學途中遇上一件事，從此立志當獸醫。他目睹一隻狗被車撞倒，痛得苦叫，他好想伸出援手，就是那一刻，他知道拯救動物就是他的夢想。這次車禍沒有讓他有陰影，反而更堅決做獸醫，為大家貢獻自己「優質、全面及跨學科的獸醫服務」。



Pet Peeve 寵物癡

Dr Almendros warns against over-indulging pets with unnecessary and unhealthy food. “Owners like feeding their pets with dumplings, bones, chicken, steaks...I know they’re tasty but they’re not meant for animals. I often see patients who come in vomiting or with diarrhoea or with a terrible pancreatic inflammation. Sometimes, they’ll have a foreign body stuck in the throat or intestine and then have to go for an endoscopy or surgery.”

“Many people in Hong Kong love their pets to the extreme and I believe that if a smart-phone was invented for animals, they would go get them for their pets,” he laughingly adds.

Angel 教授忠告大家，不要放縱寵物，胡亂給牠們餵飼既無謂又無益的食物。「有些主人給寵物餵餃子、骨頭、雞肉和牛扒等，我知道很美味，但動物不宜吃。很多動物因嘔吐、腹瀉或胰腺發炎來求診，有時因為喉嚨或腸道卡住食物，要為此做內窺檢查或做手術。」

「很多香港人對寵物溺愛無度，我想如果世上有動物智能電話，他們都會買給自己的寵物。」他笑道。



Figure 2: Dr Daniela Hernandez Muguiro examined the red blood cells

圖二：Daniela Hernandez Muguiro 博士正檢驗紅血球

A case of anaemia in a young dog was investigated by a veterinarian who suspected “tick fever”. “Tick fever” is the common name for infection of red blood cells by a range of haemoparasites after a bite by a tick such as the brown dog tick (*Rhipicephalus sanguineus*) (Figure 1).

Whole blood samples were submitted for a complete blood count (CBC) and a comprehensive screen for possible parasites by polymerase chain reaction (PCR) molecular testing.

Parasites carried by ticks and passed to dogs after a bite include *Babesia canis canis*, *B canis vogeli*, *B gibsoni* and *Ehrlichia canis*. The parasites live in the salivary gland of the tick and are transmitted when the tick feeds on blood from the dog. Fighting and contaminated needles can also transmit infection. Babesia parasites complete their life cycle within red blood cells. As damage occurs to the red blood cells, their number decreases. This leads to less oxygen carrying capacity and the dogs can become anaemic and weak. Other clinical signs and laboratory findings may include thrombocytopenia (low platelets) and organ damage if the disease remains untreated.

Diagnosis can be made by direct examination of the blood smear and confirmed by PCR. Registered specialist clinical pathologist at CityU VDL, Dr Daniela Hernandez Muguiro (figure 2) examined the blood smears on the microscope. At 1000 times magnification under oil immersion, the parasites could be seen within some individual red blood cells as one to three µm diameter, ring to pear-shaped organisms (figure 3).

In addition, the CBC found the number of red blood cells were decreased to $1.8 \times 10^{12}/L$ (reference interval 5.7-8.5), the amount of haemoglobin in the blood was decreased to 39 g/L from the usual range of 141-210 g/L and the packed cell volume had dropped to 14% from the

Investigation of Babesia infection in a dog: a multidisciplinary approach at CityU Veterinary Diagnostic Laboratory



Figure 1 The “Brown dog tick” (*Rhipicephalus sanguineus*) can act as a vector to spread haemoparasites in China. Other ticks implicated include *Haemophysalis longicornis* and *R haemaphysalioides*.

圖一：「血紅扇頭蜱」是在中國傳播血液寄生蟲的載體，其他有關的蜱蟲包括「長角血蜱」和「鑷形扇頭蜱」。



研究狗隻巴貝斯蟲感染 城大動物醫療檢驗中心跨學科診斷

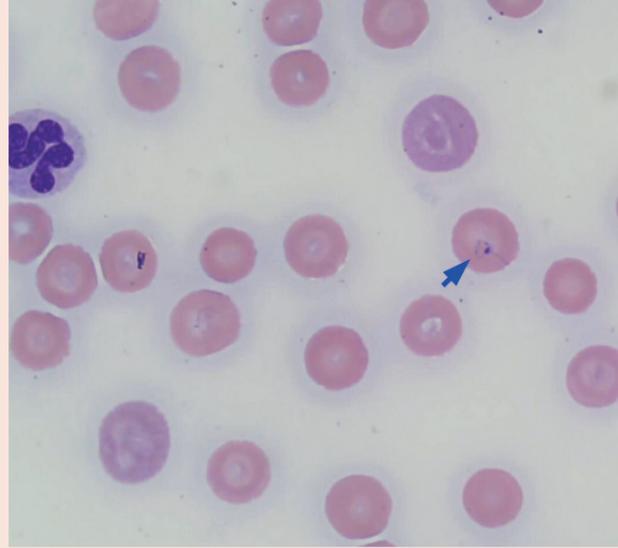


Figure 3: *Babesia gibsoni* organism (blue arrow) within the cytoplasm of a red blood cell. (Diffquik stain, 1000 x oil immersion)

圖三：在紅血球細胞質內的犬小焦蟲微生物（藍色箭咀）
（微分快速染色，油浸物鏡放大 1000 倍）

Detection rate of tick borne parasites in whole blood samples submitted to CityU Veterinary Diagnostic Laboratory

城大動物醫療檢驗中心全血樣本的蜱傳寄生蟲發現率

Parasite 犬小焦蟲	Detection % in samples 樣本中的發現率
<i>Babesia gibsoni</i> 犬艾利希體	37
<i>Ehrlichia canis</i> 韋氏巴貝斯蟲	9
<i>Babesia canis canis</i> 犬焦蟲	2

expected range of 37-58%. The number of platelets had also declined to $113 \times 10^9/L$ from the usual range of 186-545.

To identify the organism responsible for infection, PCR testing was undertaken on the blood sample as well. DNA was extracted from the blood sample and compared to known DNA extracts of the four types of haemoparasites affecting dogs in Hong Kong.

This test confirmed *B. gibsoni* was the parasite causing the infection in this dog. DNA from *B. canis canis*, *B. canis vogeli* and *E. canis* were not detected.

B. gibsoni is the most common variety of haemoparasite detected in dogs at CityU VDL and was found in 37% of samples tested. *E. canis* is the next most common parasite detected in 9% of samples, followed by *B. canis vogeli* in 2% of samples. So far, *B. canis canis* has not been detected in any samples from Hong Kong dogs.

Therapy is available for Babesia infections and is usually successful, although some dogs can become carriers of infective organisms and any affected dogs should be regularly checked for any evidence of a relapse. Severely affected dogs may need blood transfusions and careful nursing.

Early diagnosis and treatment can avoid severe disease developing. Once therapy is underway and completed, monitoring of blood samples for the presence of the haemoparasite can be undertaken by PCR to check on the efficacy of treatment.

To avoid tick bites and the chance of infection, insecticide-impregnated collars can be fitted to dogs to prevent ticks attaching and dogs can be kept clear of thick vegetation where ticks live. While ticks can also bite humans, infection by these haemoparasites only occurs in dogs and is not transmitted from a dog to a person.

一位獸醫為患上貧血的小狗診斷時，懷疑牠感染「牛蜱熱」。當狗隻被「血紅扇頭蜱」（圖一）等蜱蟲咬過，紅血球便會受血液寄生蟲感染，這些疾病稱為牛蜱熱。

獸醫要呈交完整的血液樣本，從而進行血液常規檢查（CBC），並以聚合酶鏈反應（PCR）分子測試全面搜查潛藏的寄生蟲。

蜱蟲透過叮咬狗隻而傳播身上的寄生蟲，這些寄生蟲包括犬焦蟲、韋氏巴貝斯蟲、犬小焦蟲及犬艾利希體。這些寄生蟲寄居於蜱蟲的唾液腺中，透過蜱蟲叮咬狗隻的血液時傳播，亦可透過打鬥及感染針頭傳播。巴貝斯寄生蟲在紅血球內完成生命週期，紅血球的數目因為受損而減少，令狗隻的輸氧能力下降，因而變得貧血和虛弱。其他臨床徵狀和化驗結果包括血小板減少症（低血小板），如果疾病久未得治還會造成器官受損。

獸醫可透過血塗片直接診斷，再由聚合酶鏈反應確認。城大動物醫療檢驗中心註冊專科臨床病理學家 Daniela Hernandez Muguero 博士（圖二）檢查了顯微鏡上的血塗片。當用油浸物鏡放大 1000 倍時，可見個別紅血球上出現一至三微米呈環狀或梨狀的微生物（圖三），這些微生物正是寄生蟲。

此外，獸醫從血液常規檢查中發現狗隻的紅血球數量減至 $1.8 \times 10^{12}/L$ （參考值範圍 5.7-8.5），血液中的血紅素數量由正常範圍 141-210

g/L 減少至 39 g/L，而紅血球壓積量則由預期範圍 37-58% 減少至 14%，血小板數量也從正常範圍 186-545 減少至 $113 \times 10^9/L$ 。

為了識別造成感染的微生物，獸醫亦將血液樣本進行聚合酶鏈反應測試，先在血液樣本抽取脫氧核糖核酸，並與已知傳染香港狗隻的四種血液寄生蟲的脫氧核糖核酸樣本作比較。

測試結果證實犬小焦蟲正是感染這隻狗隻的寄生蟲，而犬焦蟲、韋氏巴貝斯蟲及犬艾利希體則沒有任何發現。

犬小焦蟲是城大動物醫療檢驗中心最常在狗隻身上發現的血液寄生蟲，在 37% 測試樣本中均有發現。犬艾利希體是第二常見的寄生蟲，在 9% 測試樣本中發現；其後是韋氏巴貝斯蟲，在 2% 的樣本中發現。而犬焦蟲至今未在香港狗隻的樣本中發現。

感染巴貝斯蟲的狗隻可以獲得治療，而且痊癒機會很高，不過有些狗隻會一直帶有感染微生物，因此所有感染狗隻必須定期檢查，避免舊患復發，嚴重感染的狗隻可能需要輸血治療和專業護理。

狗隻如能及早診斷和治療，可避免病情變得嚴重，當整個療程完成後，可以進行聚合酶鏈反應測試，以監測血液樣本中是否還有血液寄生蟲，以提高治療效果。

為避免蜱蟲叮咬和感染的風險，狗主應為狗隻配戴滅蟲頸圈，不要讓狗隻前往蜱蟲出沒的厚植被。雖然蜱蟲一樣會叮咬人類，但血液寄生蟲只會感染狗隻，而不會由狗隻傳染人類。



CityU VMC benefits society in collaboration with Caritas Hong Kong's Gato House Project



As with many things in life, we rely on a bit of luck and so it happened that several months ago, at a CityU social gathering, that Dr. Howard Wong, the Director of the Centre for Animal Welfare was seated next to Professor Lo Tit Wing, Head of the Department of Social and Behavioural Science. As both were alumni of Cambridge University, the conversation was free-flowing and it quickly turned to the work of Caritas, one of the largest charitable organisations in Hong Kong and one in which Dr. Lo is intimately involved as befits someone with experience in social work. Caritas, it turned out, had a pioneering project since 2015 called Gato House, where drug-users were able to socialize with cats as part of their counseling. This unique animal assisted therapy's ultimate goal was to allow the drug user to reduce or totally quit the drug habit. Although the project is partially funded by the Beat Drugs Fund of the Hong Kong Government, this funding does not cover animals. Luckily the CityU Veterinary Medical Centre was able to step in, and offer free medical care for the 10 cats (and one hairless rat) kept by Gato House.

CityU VMC is honoured to provide the medical support to the therapeutic cats, hence, contributing to the rehabilitation of drug abusers. The service includes



consultations, medication (including prescription diet), hospitalization, surgery and screenings for disease diagnosis. CityU VMC's professional veterinarians will attend to these animals and determine the best services for them. With such free services successfully put in place, CityU VMC hopes to positively enhance the well-being of therapeutic animals. With the medical costs covered, Dr. Howard Wong turned to Dr. April Fong from Kakato, a local pet food company who is also a big supporter of the vet school, to see if they could help in providing free cat food for their resident population. Needless to say, Kakato has very generously agreed to provide free cat food to Gato House as well.

Apart from Gato House Project, CityU VMC has also engaged in the Make-A-Wish HK project that grants the wishes of children with critical illnesses to enrich their lives with experiences that will bring them happiness, hope and strength by participating in the "A Real Vet For A Day" programme.

城大動物醫療中心協助貓空計劃貢獻社會

所謂有緣千里能相會，幾個月前，動物福利中心總監王啟熙獸醫出席一個城大聚會，坐在身旁的竟然是他的劍橋大學校友——社會及行為科學系主任盧鐵榮教授。兩人言談甚歡，漸漸聊起香港最大型慈善機構之一的明愛，因為盧教授正積極參與該機構一項社會服務計劃。

原來明愛自 2015 年推出先導計劃「貓空動物輔助治療戒毒和康復計劃」，以癮君子與貓相處作為心理輔導的一部分。這個獨特的動物輔助治療計劃，旨在讓癮君子減少依賴毒品，甚至完全戒掉吸毒。雖然這項計劃獲得政府禁毒基金會部分資助，但資助對象不包括用於動物的開支。因緣際會之下，城大動物醫療中心決定參與，提供諮詢、開藥（包括處方飲食）、住院、手術和診症檢查等服務，中心的專業獸醫會悉心照顧及全心治療這些動物。城大動物醫療中心希望，這些免費服務烈以輔助戒毒的動物維持健康。除了為計劃減省醫療成本外，王啟熙獸醫亦聯絡本地寵物食品公司「卡格」的創辦人方心如博士，看看這位城大賽馬會動物醫學及生命科學院的重要贊助人可否為留院動物提供免費貓糧。不出所料，卡格慷慨解囊，答應向貓空供應免費貓糧。

除了貓空計劃外，城大動物醫療中心又與「願望成真基金」合作，為患上重症的病童實現願望，讓他們透過「當一天獸醫」活動充實生命，獲得快樂、希望和力量。



CityU dairy farm to produce local 'MADE IN HONG KONG' milk

A dairy farm being built on a one hectare piece of farmland, located in Lam Tsuen, is expected to commence operation in 2021. It will be developed into a temporary teaching farm for CityU's Jockey Club College of Veterinary Medicine and Life Sciences (JCC), to provide a blueprint for operating local dairy farms in the future, and to train local veterinary students for dairy industry.

The most exciting news for most people is that the 28 pedigree Jersey Cows imported from Australia will produce made-in-Hong-Kong milk. Hong Kong people used to have locally produced milk from the Dairy Farm Corporation, operating in Pokfulam, at the end of the 19th century. Unfortunately, the farm closed in the 1980s as dairy farming began to move north. Hong Kong's last remaining licensed dairy farm, Hong Ning dairy in Yuen Long, ceased to produce local milk about 10 years ago.

CityU took this history into consideration when planning the dairy farm. Consultants from New Zealand were hired to inspect more than a dozen plots of land, comparing sun positions, wind directions and earth moisture. They also took reference from some dairy farm designs in Sri Lanka, a place that shares a similar climate with Hong Kong and made sure that the farm will be well-ventilated and comfortable for the cows.

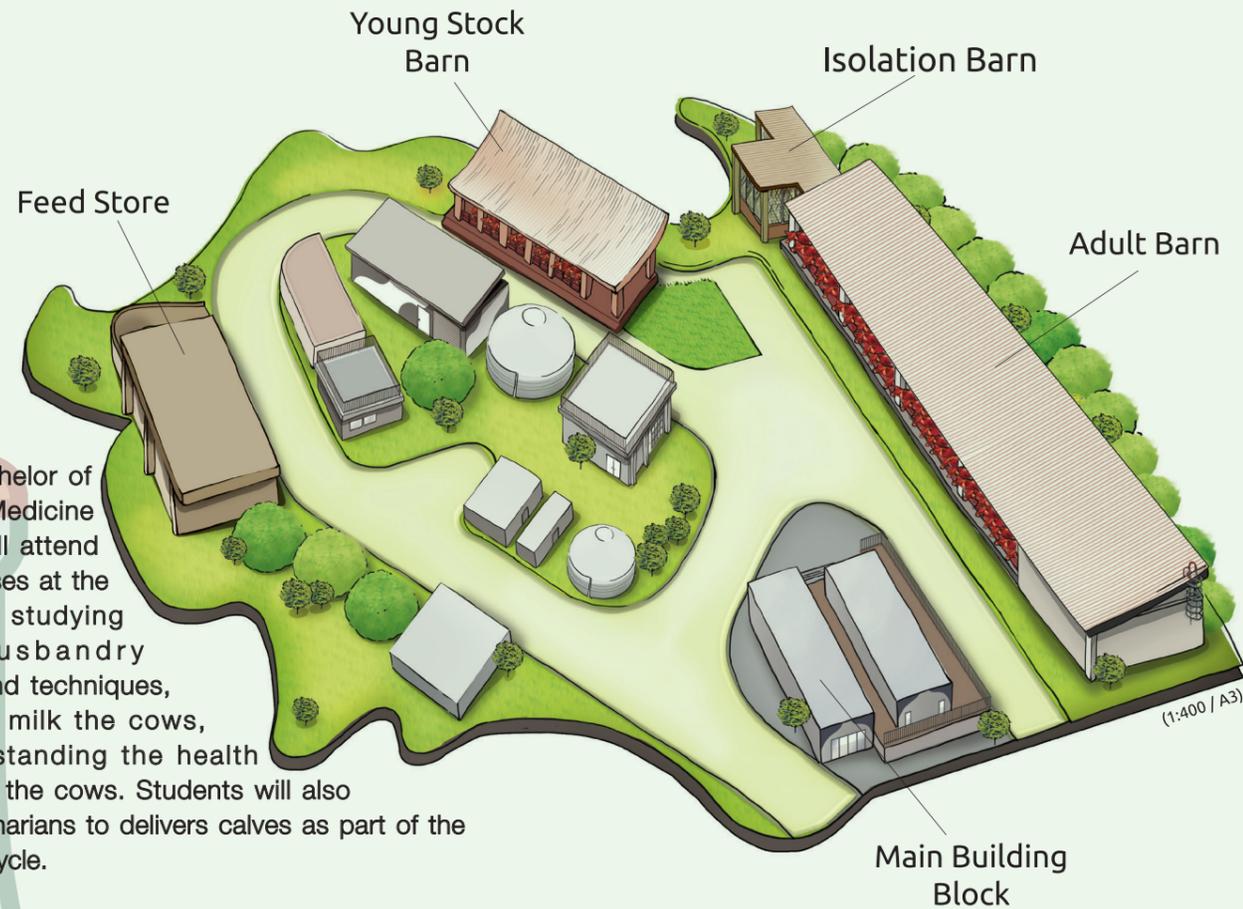
The Jersey breed was chosen for the CityU dairy farm not only because of the higher fat content in its milk, but also its relatively higher heat tolerance compared to other dairy breeds. The dairy cows will be fed US-imported hay, enabling stable milk production from the cows.

CityU's Bachelor of Veterinary Medicine students will attend regular classes at the dairy farm, studying animal husbandry concepts and techniques, learning to milk the cows, and understanding the health condition of the cows. Students will also assist veterinarians to deliver calves as part of the production cycle.

In the past when there were no locally trained veterinarians in Hong Kong, many farmers had to rely on their own experience to monitor the health of their dairy cows. Soon, local veterinarians trained at CityU will be able to provide professional support to farms to maintain optimal dairy cow health. To ensure good animal welfare, there will be an adjacent field at the farm where cows can roam and stretch their legs.

Veterinary training is an important aspect of animal husbandry. For example, Cornell University's College of Veterinary Medicine has been providing continuing education to dairy farmers in China and trained over 30 Chinese veterinarians over the past 3 years. Programmes similar to Cornell's will be planned at CityU to build educational opportunities for veterinarians in this region.

JCC will also ensure that the construction of the dairy farm meets environmental protection standards. For example, solar panels will be used to provide electricity and a large number of trees will be planted on the farm to ensure a more pleasant and habitable environment.



城大乳牛農場生產香港牛奶



大埔林村正在興建一個佔地一公頃的乳牛農場，預計於 2021 年開始運作。這是城大賽馬會動物醫學及生命科學院的臨時教學農場，既可為未來的本地乳牛業提供營運藍本，亦可培訓服務這行業的本地獸醫學生。

而最令普羅大眾興奮的，是農場飼養了 28 頭從澳洲入口的娟珊牛，將會生產「香港製造」的牛奶。香港人曾經擁有本地製造的牛奶，但要追溯到 19 世紀末，「牛奶公司」在薄扶林設立了一個乳牛農場，可惜乳牛業在 1980 年代北移，農場因而關閉。位於元朗的「康寧牛奶」是香港最後一間持牌乳牛農場，也在大約 10 年前停止生產本地牛奶。

城大規劃林村乳牛農場時汲取歷史經驗，聘請來自新西蘭的顧問考察了十幾幅土地，比較日照方位、風向和土地濕度，再參考氣候跟香港相似的斯里蘭卡乳牛農場設計，確保農場的空氣流通，讓乳牛有舒適的家。

城大農場選擇入口褐色娟珊牛，不單因為牠們的牛奶乳脂量較高，也因為比其他品種更耐熱。而乳牛的飼料則是由美國入口的乾草，確保乳牛有穩定的乳量。

城大獸醫學士課程學生會定期到乳牛農場上課，學習畜牧概念技術、為乳牛擠奶、觀察乳牛健康狀況，還會協助註冊獸醫完成乳牛業生產的一個重要環節，就是為乳牛媽媽產子。

過去香港沒有本地受訓的獸醫，許多農場主人只能靠個人經驗維持乳牛健康。由城大培訓的本地獸醫，將可為農場提供專業支援，確保乳牛的身心健康。這個農場會連接一片空地，讓乳牛自由走動，舒展四肢，確保動物得到最佳福利。

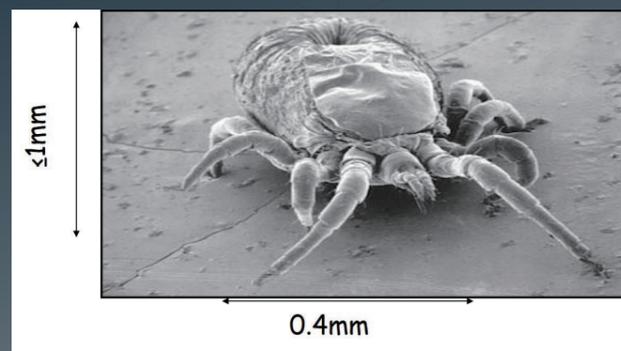
獸醫培訓是畜牧業其中一個重要範疇。以中國內地為例，美國康奈爾大學獸醫學院 3 年來為中國乳牛農場提供持續教育，至今培訓了超過 30 位中國獸醫，城大的課程會以康奈爾課程為藍本，為區內獸醫提供教育機會。

城大賽馬會動物醫學及生命科學院亦確保乳牛農場符合環保原則，例如以太陽能板為農場提供電力，並在農場範圍種植大量樹木，營造優美舒適的環境。

Introducing Professor Olivier A. E. Sparagano



The College is pleased to welcome Prof. Olivier Sparagano as our Professor of Veterinary Parasitology and Acting Head for the Department of Infectious Diseases and Public Health. Professor Sparagano has been working for 25 years in UK (but is of French/Italian descent) in different academic roles such as Director of a Research Centre and Associate Dean for Research at Northumbria University or Associate Pro Vice-Chancellor for Research at Coventry University and a research Professor for many years before joining CityU. He has been the Chair of Ethics in his last two academic positions. He is a Fellow of the Royal Entomological Society, a Fellow of the Society for Tropical Veterinary Medicine (and its former President), a Fellow of the Institute of Biology and a Fellow of the Higher Education Authority with a keen teaching interest in peer- and self-assessment and disruptive communication to provide students with key long-life professional skills. He has published over 150 peer-reviewed research papers and over 400 conference abstracts and has devoted his entire academic career to improve animal health



by developing molecular diagnostics and potential vaccines with a focus on vector-borne diseases transmitted by ticks, mites, mosquitoes, fleas, flies and other annoying creepy crawlies.

Parasites are fascinating creatures but deadly too. They are small in size but able to manipulate the host they are attacking. Some parasites will hide and escape from the defense mechanisms (skin, immune system) from their hosts (animals or humans) or will, through unbelievable strategies and clever adaptation, influence the behavior of their victim (some parasitized hosts becoming attracted to their predators!) which helps the parasite to move to the predator body continuing their life cycle. Some parasites will make sure you do not feel anything when they infect you as their goal is not to kill you (too fast) but to use animals and humans for their own advantage. They make sure they continue to survive, multiply and being able to produce the next generation to become a recurrent threat. Many parasitic species are showing resistance to drugs and there is a need for more control and treatment methods. We can find them in food, water, soils, animals, humans and the fights are not yet over.

A child still dies from malaria every 30 seconds and over 1 million cattle are killed in Africa from East Coast

fever every year and these are only two of many parasite-related problems.

Our new City University JCC Vet School will become soon the beacon of reference for fighting all these parasitic diseases for the benefit of our animals and human fellows.

Recent publications:

- Lima-Barbero, J.F., Diaz-Sanchez, S., Sparagano, O., Finn, R.D., de la Fuente, J., Villar, M. (2019). *Metaproteomics characterization of the alpha proteobacteria microbiome in different developmental and feeding stages of the poultry red mite Dermanyssus gallinae (de Geer, 1778)*. *Avian Pathology (in Press)*
- Špitalská, E., Sparagano, O., Stanko, M., Schwarzová, K., Špitalský, Z., Škultéty, L. & Havlíková, S. F. (2018). *Diversity of Coxiella-like and Francisella-like endosymbionts, and Rickettsia spp., Coxiella burnetii as pathogens in the tick populations of Slovakia, Central Europe, Ticks and Tick-borne Diseases*. 9(5), 1207-1211



Olivier A. E. Sparagano 教授

賽馬會動物醫學及生命科學院歡迎 Olivier A. E. Sparagano 教授出任獸醫寄生蟲學教授兼署理傳染病及公共衛生系署理主任。Sparagano 教授擁有法國及意大利血統，於英國工作 25 年期間出任多個學術職位，包括諾桑比亞大學研究中心主任及研究副院長、考文垂大學研究助理副校長，加入城大前任職研究教授多年，於最後兩個學術職位兼任道德主席。

他是皇家昆蟲學會會員、熱帶獸醫學會會員兼前會長、生物學研究院成員和高等教育管理局成員，對同行評審及自我評審教學興趣濃厚，愛以顛覆式交流令學生得到終生受用的專業技能。他發表了超過 150 篇同行評審研究論文、400 篇會議扼要，整個學術生涯致力改善動物健康，研發分子診斷及潛在疫苗，他的研究焦點為由蜱、蟎、蚊、跳蚤、蒼蠅及其他厭惡性爬蟲類傳染的媒介傳播疾病。

寄生蟲的構造微妙，卻又可以致命，每 30 秒就有一個兒童死於瘧疾，每年非洲有超過 100 萬隻牛死於東海岸熱，而瘧疾與東海岸熱只是眾多與寄生蟲有關的疾病其中之一。雖然寄生蟲體型微細，但對自己寄生的動物或人類宿主可以致命。有些寄生蟲可以躲避宿主的防衛系統（皮膚和免疫系統），也可以出奇狡猾地影響宿主行為。有些宿主甚至反過來要跟攻擊自己的寄生蟲共存，讓這些寄生蟲在自己身上延續生命週期。

有些寄生蟲感染宿主時會確保對方發覺不了，因為牠們不是為了殺死動物，而是要借用宿主的身體生存和繁殖，周而復始。很多寄生蟲都有抗藥性，在食物裏、水源中、泥土內、動物和人類身上屹立不倒，這場戰爭長路漫漫，因此我們必須研究出對治方法。賽馬會動物醫學及生命科學院旨在成為對抗寄生蟲疾病的橋頭堡，造福所有人類和動物。

近期出版

- Lima-Barbero, J.F., Diaz-Sanchez, S., Sparagano, O., Finn, R.D., de la Fuente, J., Villar, M.: 〈家禽紅蟎 *Dermanyssus gallinae* (de Geer, 1778) 的不同成長捕食階段的 α 變形菌微生物組的元蛋白質組學特徵〉，載《*Avian Pathology*》(2019)。
- Špitalská, E., Sparagano, O., Stanko, M., Schwarzová, K., Špitalský, Z., Škultéty, L. & Havlíková, S. F.: 〈仿科克斯菌屬及法蘭西斯氏菌屬等內共生菌的變化與立克次體，以及中歐斯洛伐克蜱種的貝氏考克斯菌病原體〉，載《*Ticks and Tick-borne Diseases*》(2018)，9(5), 1207-1211。

THE SCIENCE BEHIND INDUSTRIAL PRODUCTION OF HIGH QUALITY WARM-WATER MARINE FOOD FISH LARVAE

*Husband & wife team:
Jose Domingos and
Giana Gomes*



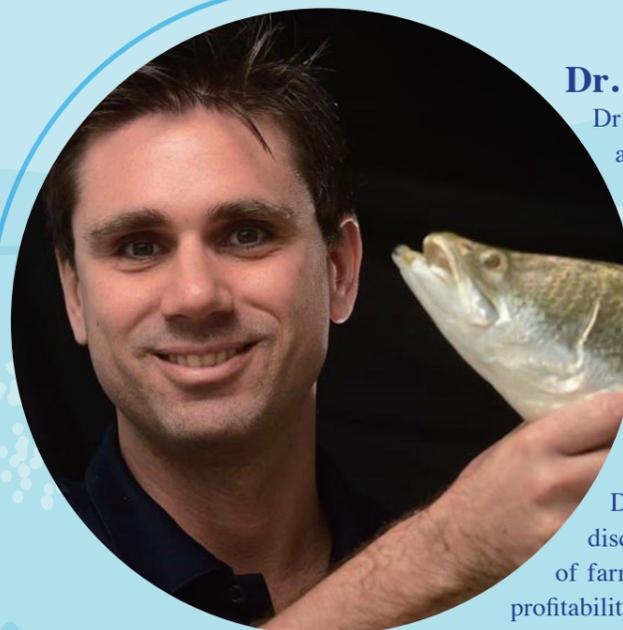
Food security will be one of the biggest challenges for humanity as the global population nears 9 billion. As the fastest growing agribusiness in the world, aquaculture is shaping to be a major supplier of humanity's future animal protein needs as it recently surpassed beef and fisheries production. In aquaculture, similarly to livestock production, seed quality and vigour are critical determining factors of crop quality and yield. Although the cost of seed represents a small fraction (<3%) of the total aquaculture production costs, the quality of seed has a significant and direct impact on the profitability of the business. However, most fish farmers from tropical regions still rely on juveniles produced from eggs spawned in sea cages from broodstock (i.e. fish in breeding condition) fed on available trash fish, and larvae reared in extensive pond or cage systems. This traditional production method has limited industrial applicability due to low and variable productivity and lack of biosecurity. Having a clear understanding of endogenous and environmental factors affecting broodstock gonadal development and conditioning, together with appropriate maturation systems are key factors for reliable spawning.

One of the biggest problems of traditional methods for production of aquaculture seeds is the lack of biosecurity measures. The use of open systems for rearing broodstock, eggs and larvae in particular, is problematic as animals are constantly exposed to all kinds of parasites and pathogens. Viral nervous necrosis (VNN), for example, is probably one of the most harmful pathogens for marine fish larvae. Recent studies powered by next generation sequencing technologies estimated that seawater contains from one to ten billion viral particles per litre. Therefore, farmed fish are constantly exposed to viruses and other pathogens. In sea cages and open ponds it is impossible to maintain basic levels of biosecurity and larval quality becomes a gamble. The odds of winning and making money out of fish farming at industrial scales using juveniles produced from open systems are limited.

Full control over the environment and genetics of the broodstock where seed stock is produced are critical points for achieving good quality seeds. For warm-water marine finfish, very few selective breeding programs exist and for those that do, improved stocks have not yet been fully disseminated to

farmers. However, genetics by itself without healthy stocks and biosecure environment does not reflect successful farming. The first and most effective step for industrial production of high quality seed stock is the investment in a fully controlled indoor production facility, with uncompromised biosecurity. Without this, the fate of any selective breeding program is at risk, because if improved broodstock become infected with viruses particularly, there are very few effective

actions to be implemented to save animals and generally stocks must be culled. A hard lesson to be learned from shrimp farming is the fact that a number of breeding programs with compromised biosecurity have been terminated after years of hefty investments in genetically superior lines. Therefore, the sustainable development and expansion of warm-water marine food fish aquaculture relies on the prompt availability of high quality seed stock.



Dr. Jose Domingos

Dr Jose Domingos' research focuses on reproduction, genomics and selective breeding programs for the development of fast growing and disease resistant strains of aquaculture species. Dr Domingos has over twenty years of commercial, governmental and academic experience of applied R&D on shrimp, seabass, cobia and snapper production in Brazil, Australia and Singapore. Dr Domingos' long involvement with commercial operations includes the management of over 700 hectares of shrimp farming in Brazil and setting of several marine fish hatcheries and breeding programmes for R&D partners in Australia and Singapore. Dr Domingos is passionate about the challenge of integrating discovery and applied science to contribute for the improvement of farm productivity and allowing aquaculture business to achieve profitability and sustainability to feed our growing population.

Dr. Giana Gomes

Dr Giana Gomes is an aquaculture veterinarian with more than 15 year working within warm-water aquaculture species in Brazil, Australia, Singapore and Hong Kong. Her research focuses on early identification of disease within aquaculture farms using environmental DNA (eDNA) techniques and water quality monitoring (environmental sensing) associated with microbiome investigation to solve one of the biggest challenges the aquaculture industry faces: disease outbreaks. Dr Gomes is also adopting IoT, AI, and molecular techniques as an innovative way to prevent and predict diseases risk in aquaculture. In 2016 Dr Gomes was the winner of two awards: "Science and Innovation and Minister Award", which recognises the best emerging young talent in rural Australian industries. Dr Giana Gomes is currently an Assistant Professor at the Jockey Club College of Veterinary Medicine and Life Sciences of City University of Hong Kong.



優質溫水海洋 食品魚苗的工業 生產科學

夫婦檔：
*Jose Domingos and
Giana Gomes*

隨着全球人口邁向 90 億，食物安全將成為人類最大挑戰之一。水產養殖業是世上增長最快的農企業，最近其生產量更超越牛肉和魚類產品，逐漸成為人類未來的動物蛋白質主要來源。水產養殖業跟畜牧業一樣講求種瓜得瓜，種豆得豆，雖然水產養殖業的飼料成本佔總生產成本極少（少於 3%），但飼料的品質對漁民盈利舉足輕重。然而，大部分來自熱帶地區的漁農，將食用死魚的魚種放進海水網箱，依靠由牠們的魚卵孵化出來的魚苗，以及由池塘及網箱繁殖的魚苗。這種傳統方法的生產力低，產量不穩，生物安全沒有保障，因此難以實現工業應用。漁民要令生產穩定，必須掌握影響魚種性腺發展和調節的內在與環境因素，同時要實施適當的培育系統。

生產水產養殖飼料的傳統方法其中一個最大問題是缺乏生物安全措施。由於動物經常暴露於各種寄生蟲和病原體中，因此這個開放系統用作培育魚種，尤以魚卵和魚苗為主，使用時便出現不同問題，例如病毒性神經壞死 (VNN) 可能是最危害海洋魚苗的病原體之一。根據最近一項由新一代測序技術作出的研究，每公升海水估計含有 10 億至 100 億病毒粒子，因此，養殖魚經常暴露於病毒和其他病原體中。漁民無法在海水網箱和開放池塘維持生物安全的基本水平，令魚苗質素難以受到保障。當養殖業要用開放系統生產魚苗，實在難以達到工業規模的盈利。

為了得到優質飼料，漁民須掌握生產飼料的魚種環境和遺傳學。漁民可以選擇的溫水海洋養殖魚類養殖計劃不多，即使有的話，也非人人可以獲得改良的魚種。然而，若漁民只靠遺傳學而沒有健康魚種及生物安全環境，也不可能令到漁業成功。優質飼料工業生產的首要步驟是投資一個完全受控的室內生產設施，還要實施完善的生物安全。否則，漁民選擇任何養殖計劃都會危在一線，因為只要改良魚種感染到病毒，便難有拯救動物的有效方法，整個漁場的魚都得宰殺。我們可從養蝦業汲取教訓，業界大量投資於優良基因品種後，但許多配備生物安全的養殖項目在數年後要終止。因此，溫水海洋水產養殖魚類食品要永續發展及擴張，必須可以隨時得到優質飼料。

Jose Domingos 獸醫簡介

Jose Domingos 獸醫的研究重點在於水產養殖品種的繁殖、基因組學及養殖項目，令這些品種得以加快養殖及預防疾病。他曾在巴西、澳洲和新加坡從事蝦、海鱸、海鱺魚和鯛魚生產的應用研發，其服務機構包括商業、政府和學術界，工作經驗超過 20 年。他長期參與商業營運，包括在巴西管理佔地 700 公頃的養蝦業，以及為澳洲和新加坡的研發夥伴成立多個海魚孵化場和養殖計劃。Jose Domingos 博士熱衷整合發明，並將應用科學用於改善魚場生產，幫助水產業殖業提高盈利和永續發展，從而滿足不斷增長的人口需求。

Giana Gomes 獸醫簡介

Giana Gomes 獸醫是水產養殖獸醫，於巴西、澳洲、新加坡和香港從事溫水水產養殖超過 15 年，其研究重點在於利用與微生物組研究有關的環境脫氧核糖核酸 (cDNA) 技術及水質監測（環境感知），在早期識別出水產養殖場的疾病，從而解決水產養殖業的最大挑戰之一：疾病爆發。Gomes 獸醫也採用物聯網、人工智能和分子技術的創新方法，預防水產養殖的疾病風險。2016 年，Gomes 獸醫贏得兩個表彰澳洲郊區工業的傑出新秀獎項：科學與創新獎及部長獎。她現任香港城市大學賽馬會動物醫學及生命科學院助理教授。

Dr. Kim Dal Young; Virus expeller, Vaccinologist and Basic scientist.

病毒剋星 疫苗專家金達榮博士

Dr KIM Dal Young joined the Jockey Club College of Veterinary Medicine and Life Sciences in July 2018 as an Assistant Professor in Veterinary Virology in the Department of Infectious Diseases and Public Health. He obtained his Doctor of Veterinary Medicine (DVM) Degree from Chungbuk National University in South Korea and then worked for two years as a Veterinary Officer at the National Veterinary Research and Quarantine Service (NVRQS) institution in South Korea. He completed a PhD degree at the College of Veterinary Medicine (Department of Pathobiology) at Kansas State University, USA. His PhD project was "Live attenuated marker vaccine development of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) using a multifunctional nsp2 domain". During his postdoctoral training period, he switched his research focus to mosquito-borne flaviviruses such as West Nile/Dengue/Yellow fever viruses and performed research at the Department of Microbiology and Immunology of the University of Texas Medical Branch at Galveston, USA. After relocation to the Department of Microbiology at the University of Alabama in Birmingham, USA, he worked in a variety of public health correlated arboviruses research projects related to the arbovirus group. He was involved in zoonotic alphavirus research including the development of live attenuated chimeric Chikungunya virus (CHIKV) vaccine candidates, the biochemical characterization of the conserved packaging signal of all alphavirus lineages, the development of an enhanced version of the Venezuelan equine encephalitis virus (VEEV) based replicon system and its application in vivo, identification of new host proteins that provide an efficient ground as replication complex formation for the genomic replication of VEEV and Eastern equine encephalitis virus (EEEV). Just before moving into HK CityU, Kim worked at the start-up level biotechnology

industry and obtained a valuable lesson on how data generated at the bench work is translated into commercial products. Dr. Kim's ultimate goal is to develop a universal vaccine delivery platform that can be utilized for a variety of vaccine candidates against infectious agents. In terms of basic research, Dr. Kim works on elucidating the mechanism of the how pathogenic viruses evade our innate immune response which he hopes will give us a better understanding regarding the development of rationally designed vaccines.

金達榮博士於 2018 年 7 月加入賽馬會動物醫學及生命科學院，現任傳染病與公共衛生系獸醫病毒學助理教授。

他在南韓國立忠北大學獲得獸醫學博士學位後，於南韓國家獸醫研究檢疫局出任獸醫主任兩年，再於美國堪薩斯州立大學病理學系完成哲學博士學位，博士論文題目為「用多功能 nsp2 領域開發豬繁殖與呼吸障礙綜合症病毒的活減毒標記疫苗」。在博士後培訓期間，他將研究重點改為蚊媒黃病毒，例如西尼羅河病毒、登革熱及黃熱病，並在美國德克薩斯大學醫學分部的微生物學與免疫學系從事研究。

其後，金博士加入美國阿拉巴馬大學伯明翰分校的微生物學系，參與人畜共患阿爾發病毒的研究，包括開發嵌合性基孔雅熱病毒 (CHIKV) 減毒活疫苗、阿爾發病毒屬保守包裝信號生化表徵、基於委內瑞拉馬腦炎病毒 (VEEV) 的增強版複製子系統及體內應用，以及識別新的宿主蛋白質，為委內瑞拉馬腦炎病毒和東方馬腦炎病毒 (EEEV) 在基因組複製提供複製複合物形成的有效基礎。

金博士來香港加入城大之前，曾任職一間生物技術初創公司，深明將研究數據轉化為商業產品之道。他的最終目標是開發一個通用疫苗輸送平台，可供各種針對感染因子的候選疫苗使用。在基礎研究方面，他致力闡明病毒迴避人類先天免疫反應的機制，讓人類更了解可如何開發更理想的疫苗。

Continuing Professional Education for Fish Vets

We were very pleased to welcome Dr. Richmond Loh, known as the 'Fish Vet' to Hong Kong to give a seminar and workshop on the principles of fish medicine to veterinarians and veterinary nurses in Hong Kong. This was the first continuing education event on fish medicine for the veterinary industry organised by the College. This event was sponsored by the Hong Kong Sustainable Aquaculture Fund, which is administered by the Agriculture, Fisheries and Conservation Department. The College's Professor Sophie St-Hilaire, who obtained a \$5 million grant from the fund, co-organised the event and was assisted by her team (Dr. Giana Gomes, Dr. Stephen Chan and Dr. Karen Chan).

Using Koi fish as an example, Dr. Loh described the common diseases of fish, how to identify and diagnose them, and how to treat them. This was followed by a wet lab where participants were able to dissect and perform simple diagnostic procedures on goldfish including making gill scrapes and performing a simple post mortem examination. Finally Dr. Loh showed some case studies and explained the treatment strategies for various issues including parasitic, bacterial and water quality problems.



Dr Richmond Loh is based in Perth, is an aquatic veterinarian & fish pathologist, consulting as The Fish Vet, servicing all aspects of ornamental pet fish owners including hobbyists, public aquaria, retailers, wholesalers and fish farmers since 2002. He is famously known in veterinary circles for "Fish Vetting Essentials" book, and in fish hobbyists circles featuring in "The Fish Doctor" YouTube Channel. He served as the 2014 President of the World Aquatic Veterinary Medical Association (WAVMA), and Secretary of the Aquatic Animal Health Chapter of the ANZCVS. Dr Loh graduated from Murdoch University and is an Adjunct Senior Lecturer, has a Masters in veterinary pathology, Memberships in both Aquatic Animal Health and in Pathobiology, is a Certified Aquatic Veterinarian and one of only 11 Distinguished Fellows of the WAVMA.



Aquaculture is immensely important to Asia and it is the fastest growing segment of agriculture and has been for over 3 decades.

The Food and Agriculture Organization of the United Nations estimates that food and protein production needs to double by 2050 to feed the global population but that it won't come from livestock production which is constrained by land availability.

Increased production brings increased complexity, tighter margins and encourages corner cutting and use of veterinary drugs

With over 100 million tonnes produced per year in China alone, the need for veterinary input into the industry has become more and more necessary. Consumer demands for cheap food as well as safe food put demands on the production of fish with the tendency to increase stocking density and farm size, seriously constraining the ability to produce a safe and high quality product. Moreover, land based agriculture is based on a stable group of species whereas aquaculture has an ever increasing number of different species and ever increasing geography where fish are raised.

水產養殖業在亞洲舉足輕重，成為 30 年來增長最快的農業界別。聯合國糧食及農業組織估計，為了養活全球人口，食物及蛋白質的生產量要在 2050 年前增加一倍，但由於土地有限，增加的產量不可能來自畜牧業食品。

要增加食品產量並不簡單，也令生產商利潤更低、業界使用獸醫藥物時急於求成。

單是中國，每年就生產逾一億噸魚類食品，因此更有需要為業界培訓獸醫。消費者都追求價廉物美的食品，魚類食品需求自然日益增加，生產商便爭相增加養魚場的規模和密度，可能因而影響食品的質素和安全。此外，建基於土地的農業生產種類穩定，但水產養殖業的生產種類愈來愈多，連養魚的空間也不斷增加。

魚獸醫持續專業教育課程

我們有幸邀請到有「魚醫生」之稱的 Loh 獸醫親臨香港，為本地獸醫及獸醫護士主持有關魚類藥物的研討會和工作坊。這是城大賽馬會動物及生命科學院首個為獸醫界而設的魚獸醫專業教育課程，並獲得漁農自然護理署旗下漁業持續發展基金贊助。城大賽馬會動物及生命科學院沈蕊莉教授獲基金撥款 500 萬港元，由其團隊的 Giana Gomes 獸醫、Stephen Chan 獸醫及 Karen Chan 獸醫協助合辦這個活動。

Loh 獸醫以錦鯉為例，介紹常見的魚類疾病，以及辨識、診斷及治療方法。參加者其後在濕實驗室為金魚解剖及作簡單診斷，製作刺網及基本驗屍。最後，Loh 獸醫以不同案例講解寄生蟲、細菌及水質等不同問題的解決方法。

長居澳洲珀斯的 Richmond Loh 獸醫是水產養殖獸醫及魚類病理學家，被大家奉為「魚獸醫」，自 2002 年服務各類觀賞寵物魚的主人，包括業餘愛好者、公眾水族館、零售商、批發商和漁民。他在獸醫界以出版 *Fish Vetting Essentials* (《檢查魚類手冊》) 聞名，其 Youtube 頻道「The Fish Doctor」(魚醫生) 深受一眾魚迷歡迎。他於 2014 年擔任世界水產獸醫協會 (WAVMA) 主席、澳洲及新西蘭獸醫學家學院 (ANZCVS) 水產動物健康部秘書。畢業於梅鐸大學的 Loh 獸醫是該校的客座高級講師，擁有獸醫病理學碩士學位，是水產動物健康及病理學成員，也是獲認證的水產獸醫，並且成為世界水產獸醫協會 11 位傑出院士的其中一員。

SHAPING THE FUTURE OF VETERINARY MEDICINE AND LIFE SCIENCES



Jockey Club College of Veterinary
Medicine and Life Sciences

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