AUTUMN 2020

UCD Veterinary Community News

Nuacht Phobal Tréidliachta UCD

The Newsletter of the
UCD School of Veterinary Medicine

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About the UCD School of Veterinary Medicine

The UCD School of Veterinary Medicine is the only school of Veterinary Medicine on the island of Ireland. Accredited by the European Association of Establishments for Veterinary Education (EAEVE) and the Veterinary Council of Ireland (VCI), our MVB degree programme is one of only seven in Europe fully accredited by the American Veterinary Medical Association (AVMA). We have a track record in education that is second to none and our excellence in teaching & learning, research and clinical endeavour is internationally recognised. In 2019, the School received an Athena SWAN bronze award for its commitment to gender equality.

Contributors

Many thanks to the following: Sarah Barry, David Brayden, Rory Breathnach, Diane Cashman, Daniel Collins, Nicola Fletcher, Emma Golding, Eamonn Gormley, Bridget Hogg, Clodagh Kearney, Ruoyao Ma, Morgane Mitermite, Simon More, Alex McMullin, Dáire O'Driscoll, John Mark O'Leary, Alison Reynolds, Warren Schofield.

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Dean's Welcome

Dear Colleagues and Friends,

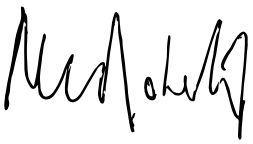
I am delighted to introduce the third edition of our School Newsletter, UCD Veterinary Community News, and I would like to thank our Communications Manager, Dr Helen Graham for all the work she has done in its preparation.

The Newsletter is replete with inspiring stories of student and staff engagement with the national effort in the face of the COVID-19 pandemic – our 'One Health-One Welfare' motto has never been more relevant than at this time.

Our final year class of 2021 began in the virtual classroom of Brightspace on 20 July and we look forward to welcoming students onto Veterinary Hospital rotations on 7 September. I would like to thank all those involved in the clinical teaching of the final year students for the enormous efforts they have made, in addition to keeping the hospital open and running efficiently since 13 March. It is with great hope and expectation and a little trepidation, that we also look forward to the arrival of Veterinary Medicine and Nursing students, Years 2-4 on 21 September and our new recruits one week later.

Cuireann sé gliondar croí orm an nuachtlitir seo a sheoladh.

Very best wishes / ***le gach dea-ghuí***



Professor Michael Doherty

Dean & Head of School

Follow the Dean on Twitter: **@DohertyVetDean**

Message from the

Communications Manager

Dr Helen Graham, Communications Manager

Welcome to the third edition of UCD Veterinary Community News, the Newsletter of the UCD School of Veterinary Medicine. When the School launched its Strategic Plan at the end of last year, no one could have envisaged how important our **'One Health, One Welfare'** mission statement would become in the months that followed.

The School's vision of positively impacting health, animal welfare and the environment has been realised through staff and student engagement with local and national efforts around the COVID-19 pandemic. In this edition of our Newsletter, we highlight some of our core activities which have carried on since lockdown began in March, albeit in different ways; we look at how teaching and assessment activities have been delivered and also at the work of the UCDVH Large Animal Surgery Team who, having adapted to many changes, have been busier than ever this year. Conferring day is always a highlight in the School calendar but it took a very different form this year as we moved to a virtual ceremony.

Speaking at this event, Dr Martin Blake, Chief Veterinary Officer, described the work veterinary professionals are carrying out to support medical colleagues as the 'living embodiment of One Health' and this has been seen across our School where students and staff have put their regular activities on hold to work on COVID-19 related research projects and testing and tracing work. At a local level, many initiatives that are important to our community have continued - we have 28 students carrying out summer research projects, and staff in the School continue to work on key research projects; we take a look at highlights from both of these areas and also some of our recent postgraduate successes.

Our 'From the Archives' piece takes us back to 1978 and an interview with Senator Justin Keating, the 'New Dean for Merged Faculties,' where we see that whilst there have been many changes in the Vet School since then, what has remained the same is the enthusiasm and commitment of staff and students across our community; never has this been more apparent than over the past few months. We hope you enjoy reading our Newsletter.

Dr Helen Graham
Communications Manager

Email: **helen.a.graham@ucd.ie**

News In Brief

→ Community Garden Update

The Community Garden has continued to bloom throughout the lockdown. Seed potatoes saved from last year were put out to chit just before the lockdown began; as restrictions began to be lifted, they were planted in the raised bed in the vegetable garden and have been flourishing ever since. Thanks to the efforts of our keen gardeners last year, the garden was seeded with cover crops of Phacelia and white and red clover. These crops have not only returned nitrogen back to the soil with the help of their bacterial symbionts, but have put on a magnificent display of flowers. This, along with the herb wheel, was very much appreciated by the bees and other pollinators. Having given the garden a year to rest, we look forward to a bumper crop next year!

→ John Gleeson

Vet School PhD graduate **John Gleeson** (2015) was recently appointed as a Senior Scientist in Biopharmaceutics at Merck in the US. John will be working at Merck's main research site at Rahway, New Jersey. After graduating from the Vet School, John completed postdoctoral positions at University of California, Los Angeles and Carnegie-Mellon University. We wish John all the best in his new role.

→ Sheep Veterinary Society Research Grant for Nicola Fletcher

Nicola Fletcher (Ad Astra Fellow) from our Veterinary Biosciences Section has been awarded a research grant from the Sheep Veterinary Society to develop an ante mortem test for Jaagsiekte sheep retrovirus based on a liquid biopsy approach, in collaboration with Chris Cousens at the Moredun Institute and Luke Meredith at the University of Cambridge. The overall aim is to develop this into a diagnostic test and this project will hopefully provide proof-of-principle.

→ Ann Derwin appointed Ambassador to China

Congratulations to UCD School of Veterinary Medicine alumna and 2018 UCD Alumni Award winner **Dr Ann Derwin** on her appointment as Ireland's new ambassador to China. Ann is currently Director General, Global Irish Services in the Department of Foreign Affairs and previously served as Chief Economist and Assistant Secretary in the Department of Agriculture. Throughout her career, Ann has been a passionate advocate in Ireland and internationally of the need to enhance the role of women in the agri-food sector. Ann is pictured at the 2018 UCD Alumni Awards with **Professor Andrew Deeks**, President of UCD (left) and **Professor Michael Doherty**, Dean & Head of UCD School of Veterinary Medicine (right).

→ Prestigious NUI-French Government Award for PhD Student

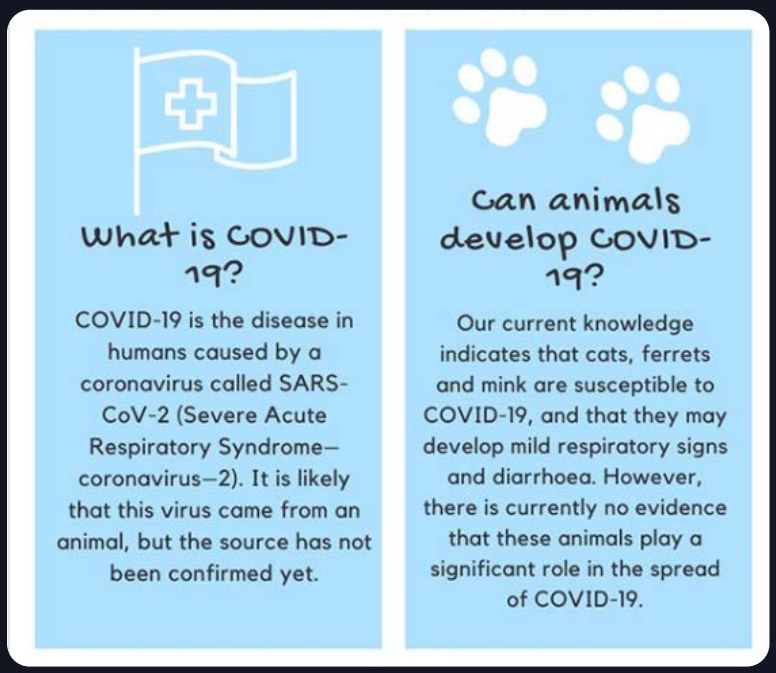
Ollscoil na hÉireann
National University of Ireland

Caroline Twarog, who recently defended her PhD thesis, has been awarded a prestigious National University of Ireland (NUI)-French Government award for students who have distinguished themselves on collaborative postgraduate programmes with French Higher Education Institutions. Caroline undertook her PhD as a co-tutelle student at the Galien Institute (*Université Paris-Sud*) and at UCD, supervised by **Prof Elias Fattel** and **Prof David Brayden.**

UCD Vet Sciences

@ucdvetmed

We've put together answers to some of the most frequently asked questions about COVID-19 and animals. More detailed information is available in our website: ucd.ie/vetmed/newsandevents



UCD School of Veterinary Medicine Celebrates the

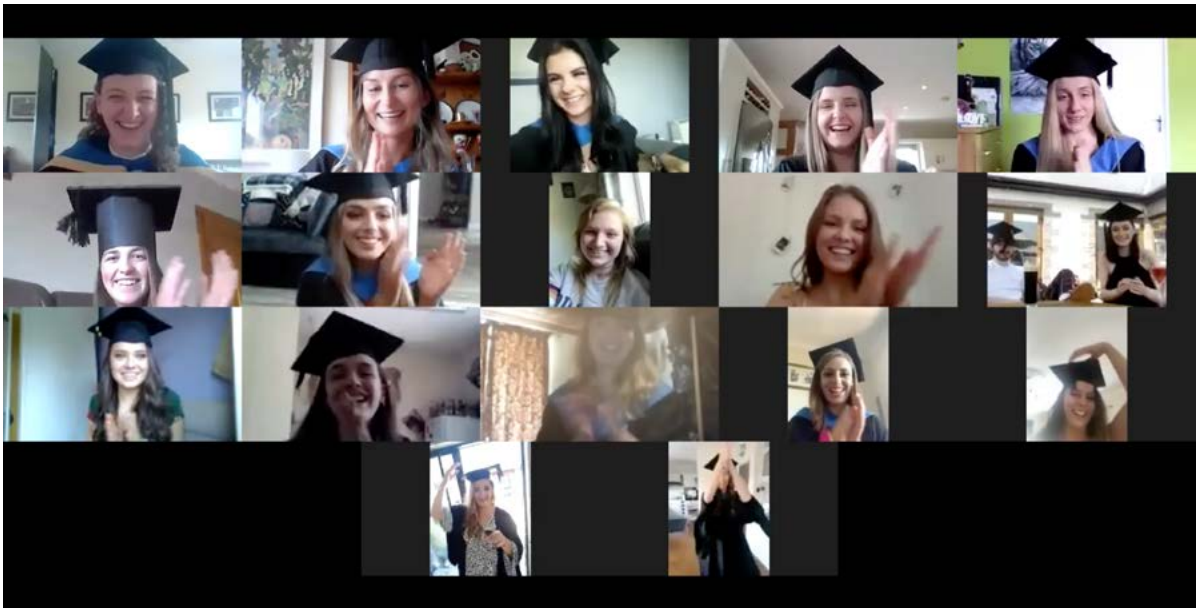
Conferring of over 200 Graduates

→ The Veterinary Medicine and Veterinary Nursing Class of 2020 receive their clinical dress at the UCD School of Veterinary Medicine White Coat Ceremony, March 2019

→ The UCD School of Veterinary Medicine was delighted to confer over **200 graduates** on 15 June with undergraduate and graduate qualifications from a range of programmes: Veterinary Medicine, Veterinary Nursing, Graduate Certificates in Dairy Herd Health and Small Animal Medicine, Masters and Doctorates. The School was also joined by graduates from Veterinary Public Health and Food Regulatory Affairs programmes which are jointly run with the University of Ulster. The annual conferring ceremony is always one of the highlights of the School's calendar, but due to COVID-19 related restrictions, it took place as a virtual event this year.

Professor **Michael Doherty**, Dean & Head of the School of Veterinary Medicine, opened the ceremony by welcoming the graduates and their families and friends to the event. He noted that graduation day is normally a 'wonderful occasion where you and your families can embrace one another and share a very special day. However, we are all together in spirit...never has our School motto of 'One Health, One Welfare' been more appropriate. We salute the resilience that you, the Class of 2020 has shown in the face of the COVID-19 pandemic and we are proud of you.'

Addressing the Class of 2020, **Michael Creed**, TD, and then Minister for Agriculture, Food and the Marine noted the challenges that this group of graduates had faced collectively in completing their studies over the last number of months. Rising to these unprecedented challenges has brought into 'sharper focus the 'One Health' concept and the challenges around antimicrobial resistance, around environmental and



→ **Newly graduated Veterinary Nurses celebrate on Zoom**

public health, and around diseases that the Department of Agriculture deals with all the time. Arising from your experience in UCD, you are uniquely qualified now to make your contribution to this interdisciplinary challenge that faces us as a global society.'

Also speaking at the virtual conferring ceremony, **Dr Martin Blake**, Chief Veterinary Officer, Department of Agriculture, Food and the Marine and UCD alumnus, again highlighted the theme of 'One Health.' Dr Blake said that the pandemic has served to emphasise the **'absolute interconnectedness of animal health, human health and the health of our shared environment'** and he described the work of veterinary professionals in supporting medical colleagues across the world as 'the living embodiment of One Health.' When faced with challenges in the coming years, Dr Blake advised the Class of 2020 to 'always remember and recall the friendships you've developed in UCD. Look out for each other and support each other.'

Other speakers at the ceremony included **Professor Andrew Deeks** (UCD President), **Professor Cecily Kelleher** (College Principal, UCD College of Health and Agricultural Sciences) and **Mr Joe Moffitt** (President, Veterinary Council of Ireland) The Class of 2020 were also addressed by student representatives - **Maria Lagan** (Veterinary Medicine) and **Jadine Buggy** (Veterinary Nursing).

→ **Peter Howard, Veterinary Medicine Graduate**

→ **Ellen Lane, Veterinary Nursing Graduate**

The ceremony can be viewed via the following link: https://www.ucd.ie/vetmed/about/conferring/


Michael Doherty

@DohertyVetDean

aoibhneas an dúlra ..leigheas ar an imní ...
nature's beauty....time to 'zoom out'

One Welfare & the Horse-Human Bond

We all know, be it as owners or veterinary professionals, the strong bonds people form with their animals so it is unsurprising that owners' emotional wellbeing is often compromised when their animals are sick or injured. Just as One Health recognises that human and animal health are intrinsically interconnected, One Welfare is an approach that recognises the same when it comes to welfare and wellbeing.

As a result of her own experience with one of her ponies, **Emma Golding** (pictured with her horse **Lily**, the inspiration behind the research) wanted to incorporate a One Welfare approach to her PhD on owner awareness of Equine Metabolic Syndrome. While most research to date into the emotional impact of animal illness and death has focused on household pets, mostly dogs, and One Welfare has rightly highlighted the link between farmer and livestock welfare, horses and their owners form a distinct group, with feet in both worlds.

It is hoped that better knowledge of chronic health conditions on the part of owners will help contribute to better welfare for their horses through earlier diagnosis and more effective management and, in turn, potentially less emotional distress for the owners. This connection and feedback between animal welfare and human wellbeing is at the core of the One Welfare concept.

To begin exploring this connection, Emma, 3rd year Veterinary Medicine student **Aoife Neavyn Neita**, and supervisors Dr Vivienne Duggan and Dr Nicola Walshe are conducting a survey of horse owners in Ireland, funded by **World Horse Welfare**, to examine their knowledge and perceptions of various equine health conditions. Respondents will be presented with vignettes depicting eight common equine health conditions followed by questions to rate their knowledge of the condition as well as how they feel it would affect their horse and themselves. The research team will also look at which factors owners are most concerned about when it comes to horse illness, as well as what influences their decisions regarding euthanasia if their horse was suffering from a serious illness. Owners will also be asked for their judgement on the information available online for any of the conditions they have needed to research as the availability of up-to-date, easy to understand information is a key component in increasing owner knowledge of equine health conditions.

One Health in Action: UCD School of Veterinary Medicine & COVID-19

Contact Tracing During the COVID-19 Pandemic: Dáire O'Driscoll, Stage 3 MVB Student

→ I got involved in the UCD Contact Tracing Centre (CTC) after I received an email from the Dean, **Prof Michael Doherty**, looking for volunteers for the CTC; this was shortly after the campus had closed. At first, I was hesitant, but upon seeing that **Dr Locksley Messam** from the Vet School was involved, I decided that I'd give it a go. I was trained two days later by Locksley himself and noticed from the start that there was a large presence from the Vet School. Student Adviser **Niamh Nestor** and **Sarah Murphy**, a student like myself, were trained at the same time as me. As the weeks went by, I got to know lots of researchers, lab staff and lecturers from the School. There were many of us in and out of the CTC every day, putting in long hours trying to get through cases.

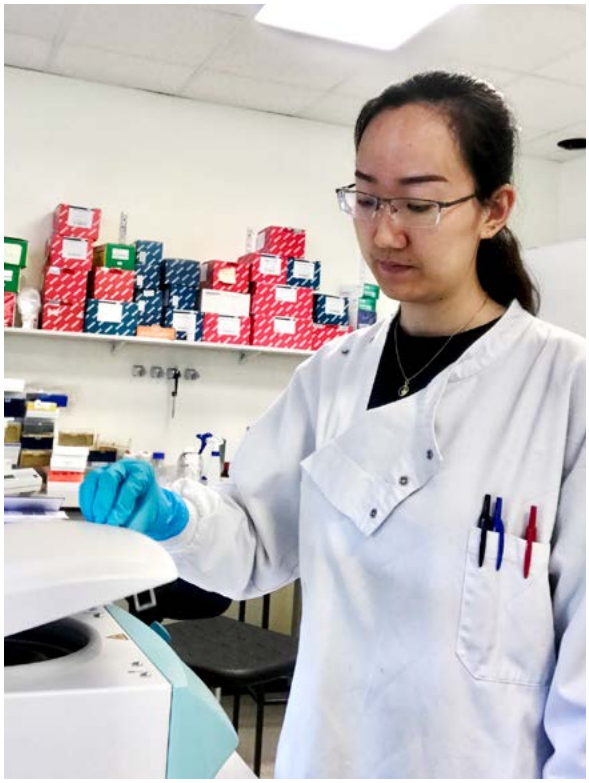
The work was very rewarding and helped me feel purposeful throughout the lockdown. As time went by, I was asked by **Prof Mary Codd** and **Prof Patrick Wall**, both from the UCD School of Public Health, Physiotherapy and Sports Science (SPHPSS), to take on the role of Operations Lead. This meant long days and nights, but the cooperation and teamwork by all involved and the knowledge that our work was making a difference kept us all going. We even had a few visits from RTÉ who were interested in shooting some footage about the CTC for the RTÉ News and Primetime.

There were also plenty of lighthearted moments, with **Prof Pat Wall** and **Prof Joe Carthy** (Dean of Science) keeping us entertained, and the rivalry between different schools while trying to work through the HSE backlog made the work all that bit easier. I found it very rewarding working with students, researchers and postgrads and loved the opportunity to boss around some of my lecturers! I'm happy that I was able to make a contribution to the national COVID-19 effort and proud of the great work done by UCD and especially the Vet School.

Diary of a COVID-19 Testing Volunteer: Ruoyao Ma, PhD Student

→ During the lockdown, I volunteered to assist with the COVID-19 testing in the Microbiology Lab of St Vincent's University Hospital (SVUH) which is led by **Prof Kirsten Schaffer**. This was an interesting period as I mainly worked in the Biosafety Level 2 (BSL-2) lab; in the BSL-3 lab, lysis buffer was added to kill the virus and expose virus RNA from patient swabs. Volunteers were assigned two shifts a day and two people were required for each shift, seven days a week so it was an extremely busy period. Each morning, the lab needed to be prepared prior to receiving samples from the BSL-3 lab. Upon receipt of samples containing inactivated virus, our priority was to load them onto the MagNa Pure 96 machine to extract and purify the virus RNA. The RNA was reverse transcribed to cDNA and certain genes specific to COVID-19 were amplified by Real-Time PCR on a 96-well plate in a Light Cycler 480. The results were then reported to consultants once ready.

I worked in SVUH for approximately two months and it was a pleasure to work with many great scientists and consultants. It was also a very new and different experience for me to work in a clinical lab within a hospital setting. Knowing that each sample related to a patient and subsequent results had the potential to determine that patient's healthcare plan meant that the correct procedures needed to be followed during the whole process. It was a challenging time as it was necessary to solve problems and optimise protocols in a relatively short space of time and we faced many challenges due to consumable shortages. It was a great opportunity for me to be able to utilise the lab skills I have acquired from my research in UCD and directly transfer my knowledge to help with clinical testing during this period. Many researchers like me were given an opportunity to step out of our 'ivory towers' to work on the front line during the pandemic and I am so glad now to see the daily confirmed cases getting lower and lower and myself and my colleagues can return to our research once again.

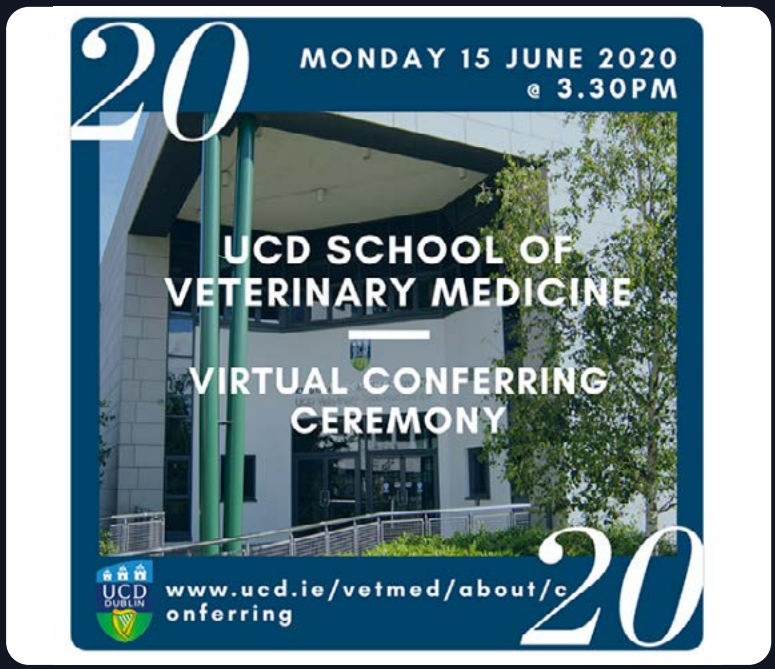


Ruoyao Ma is a 3rd year PhD student in Infection Biology. Her project, 'Defining the molecular virulence mechanisms of Mycobacterium bovis' is sponsored by the Chinese Scholarship Council and supervised by Professor Stephen Gordon in the UCD School of Veterinary Medicine.

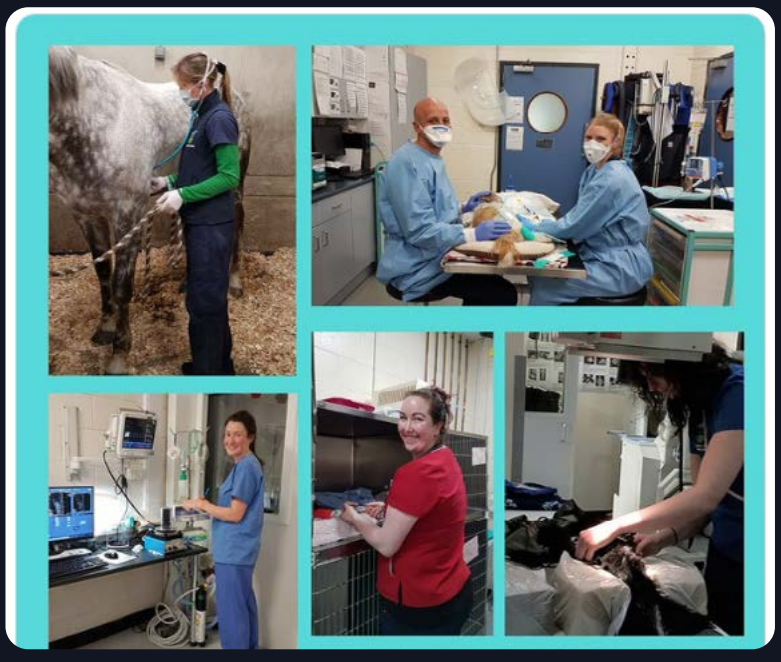
UCD Vet Sciences

@ucdvetmed

We're delighted to be joined by Minister Michael Creed @creedcnw & Dr Martin Blake, Chief Veterinary Officer @agriculture_ie and Joe Moffitt, President of the Veterinary Council of Ireland for this afternoon's Virtual Conferring Ceremony. Join us @ 3.30pm
http://ucd.ie/vetmed/about/conferring



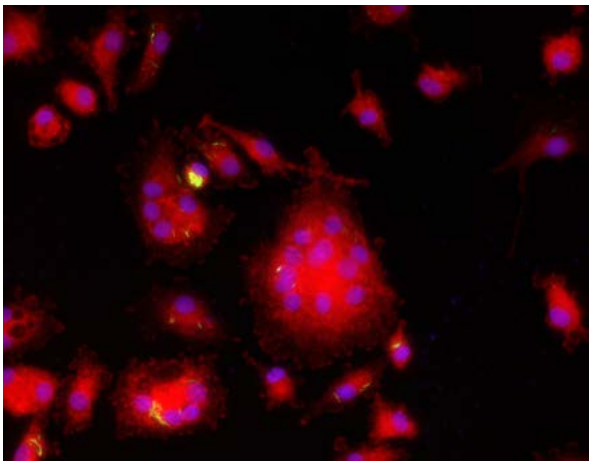
May is RVN Awareness Month & we want to take this opportunity to say a huge THANK YOU to all our wonderful Vet Nurses who do such an amazing job taking care of animals across our Hospital& who continue to provide outstanding care for patients under difficult circumstances. 👏



An Unexpected Journey from Cell Imaging of Bacterial Infection to Diagnostic Testing for COVID-19: Morgane Mitermite, PhD Student

→ When UCD closed, I was just finishing a round of in vitro infection assays on bovine alveolar macrophages with different strains of ***Mycobacterium bovis***. This basically summarizes my expertise: I know a bit of bacteriology, I have some competence in cell biology, what better than combining both? I got lucky. I am in the 4th year of my PhD and this was the very last big experiment planned before starting to get serious with writing. Just in time!

And then we started to get emails asking for volunteers to help on the huge COVID-19 testing effort…I thought to myself, I can help, I am not a virologist, but I work in a full containment level 3 (CL3) lab on a regular basis and we are facing a virus that needs to be handled with the same level of caution. So I volunteered to work in the **Enfer group** in **Naas**, which already has a strong expertise in the veterinary diagnostic field. Two days later I started work there, and I have never experienced anything like that before. In the middle of a global crisis, when everyone was asked to stay home, I had to leave home to live in a hotel room beside the lab, and, protected behind PPE, I met more people than I have ever met in my life, from a large variety of backgrounds. And I was not working on sample preparation in the CL3 lab as I thought I would be, but in the CL2 lab, doing the final step of testing: RNA purification and PCR analysis.



The team I worked with was amazing. We were working in a constantly changing environment, with a regular increase of the number of machines, along with the number of samples to be processed. The processing worked as follows: the lysates came in tubes from the sample preparation lab and each had a specific barcode that can be traced back to the patient after analysis. These tubes were transferred to 96-well plates, with 92 patient samples and 4 controls per plate, and then put in a Chemagic 360 instrument that proceeds to RNA extraction in 80 minutes. Then the samples and controls were transferred to another 96-well plate which already contained all the real-time PCR reagents and put in a LightCycler 480 Instrument that completes the analysis in an hour. These machines were always in use, and one cycle was immediately followed by another. We had to communicate continuously to make sure to maintain the fluency of the process and that all materials, buffers and reagents were maintained, available and at working levels, in quite a noisy environment due to the machines and with masks on our faces. We were working 8 hours a day, and at the peak of the crisis it was on a 24-hour basis, 7 days a week, with 3 shifts each day and a regular turnover on those who were working at night.

Outside of the analysis teams, you can also imagine how much organisation this whole process required, in terms of providing more and more machines to work in parallel and increase productivity, the buffers, the materials, etc. Most of the PCR machines came from actual research labs - just a week before I arrived at Enfer, the labs we worked in didn't even exist! Ten days after my arrival, the labs were fully functional and from that date our testing capacity never stopped increasing. At the peak of the crisis, I would say we were analysing around 5,000 samples every 24 hours.

And then after a few weeks, things started to slow down, less samples were coming, which meant things were getting better, partially thanks to our efforts. And I went back to my PhD, writing my thesis and analysing cell imaging of my last infection assay (pictured). Even now, when I think about this time, I am amazed at the amount of work and dedication it took from people from so many different backgrounds and expertise to organise themselves together and make all of this run efficiently. I spent a month and

a half working on diagnostic testing, in a veterinary diagnostic laboratory that completely reinvented itself to process a huge number of samples in order to protect the human population from a zoonotic disease - One Health in action!

I am extremely grateful for this experience, as it made me realise that this work, as different it might be from my PhD, completely falls into my areas of expertise. PhD students are so involved in their field that they tend to forget how much the PhD experience brings them in terms of fast thinking, adaptation to unexpected challenges and resilience to stress.

Morgane Mitermite is a 4th year PhD student in Infection Biology. Her PhD project 'Defining the role of the secreted protein MPB70 of M. bovis in host-pathogen interaction' is supervised by Prof Stephen Gordon and funded by the Wellcome Trust.

Supporting Teaching & Learning During COVID-19

→ Early 2020 saw the abrupt closure of third level campuses in an effort to prevent the spread of COVID-19; this action resulted in unprecedented challenges to the delivery of educational programmes. The UCD School of Veterinary Medicine did not escape this shockwave and had to redesign several programmes for online delivery mid-trimester.

The undergraduate programmes delivered by the School are complex in their design as they must ensure students develop a range of Day One Competencies upon graduation to meet the needs of the profession and society. These competencies span three domains: knowledge, skills and professional attributes. A key challenge for faculty when moving to online delivery was designing learning interactions that support student active learning and the development of higher order thinking skills across all three domains. This move cannot be achieved by simply converting face-to-face teaching approaches to an online format, pedagogical considerations have to be made that require a fundamental redesign of modules. These considerations include:

- Developing authentic learning activities
- Developing rich media learning resources
- Managing student engagement online
- Adapting delivery for a variety of learning contexts and online access

Luckily for the School, blended and online learning has been widely promoted as an educational strategy for several years. Faculty have been supported to experiment and innovate with educational technologies in their modules with the help of an Educational Technologist and other staff in the VetEd Hub team and in 2019, UCD acquired a new virtual learning environment, **BrightSpace**, which prompted many faculty to innovate with blended learning approaches further.

To deliver module content, faculty developed a series of online lectures and media rich learning resources for students. Student engagement was fostered by developing learning activities and discussion forums. Case-based learning resources and activities featured in several modules encouraging students to apply their knowledge to authentic scenarios that would mirror practice. Some modules provided live seminars and tutorials to students and Stage 4 students conducted communication skills sessions online by role playing history taking scenarios with actors. Not all components of the curriculum however could be delivered online; rotations in the Veterinary Hospital and planned work placements were disrupted and some clinical skills had to be deferred until later stages of the programme.

Assessment strategies had to be reconsidered and practical guidelines were developed by the School's VetEd Hub team to complement UCD guidance. Alternatives to regular assessments were open book exams which assess the students' ability to use information for problem-solving rather than factual recall. The exam schedule was extended from two weeks to three weeks, with 45 exams taking place during this time. Efforts were made to stagger the exams for each student cohort throughout this period and as most international students had returned home, consideration was given to their time zones and how

many hours ahead or behind these students were. **Carla Coll**, the School's Educational Technologist, created a useful student guide to online exam technical preparation and advice on troubleshooting during an exam. Extra time was given to the standard assessment period to support students if technical issues arose.

Feedback was sought from students and this information was used to enhance the teaching, learning and assessment experiences further. For example, some faculty facilitated check-ins with students online via BrightSpace and also conducted short surveys with students.

The COVID-19 pandemic posed new challenges to the delivery of the School's programmes. While staff were well positioned to meet these challenges, significant effort, time and resourcing was required to adapt to online teaching and to ensure modules were delivered. COVD-19 still poses hurdles for the upcoming Autumn trimester and staff are working tirelessly to make sure that students receive the best possible educational experience in September 2020.

COVID-19 Related Research by the UCD Centre for Veterinary Epidemiology & Risk Analysis (CVERA)

→ Since mid-March, several CVERA colleagues have contributed to the work of the IEMAG (Irish Epidemiological Modelling Advisory Group), one of the 9 subgroups of the National Public Health Emergency Team (NPHET). Chaired by **Philip Nolan**, the IEMAG provides advice and expertise in support of national decision-making in the area of epidemiological data and modelling. Areas of CVERA contribution have included estimating key epidemiological parameters (such as incubation period, proportion of infected people who are asymptomatic etc), providing biological input into model development, contributing to the design and assembly of national databases, spatial analysis and developing a COVID-19 early warning system. This latter work is adapted from an early warning system for bovine TB, currently under development. The following CVERA, UCD Veterinary Medicine and DAFM colleagues have been involved in this work: **Ann Barber**, **Andrew Byrne** (DAFM One Health), **Miriam Casey**, **Áine Collins**, **John Griffin** (DAFM retired), **Liz Lane** (DAFM), **Jamie Madden**, **Conor McAloon** (UCD Veterinary Medicine), **Guy McGrath** and **Simon More.**

Recent Publications related to COVID-19:

McAloon, C.G., Collins, Á.B., Hunt, K., Barber, A., Byrne, A.W., Butler, F., Casey, M., Griffin, J., Lane, E., McEvoy, D., Wall, P., Green, M.J., O'Grady, L., More, S.J., 2020. **Incubation period of COVID-19: a rapid systematic review and meta-analysis of observational research.** https://bmjopen.bmj.com/content/10/8/e039652

Byrne, A.W., McEvoy, D., Collins, Á.B., Hunt, K., Casey, M., Barber, A., Butler, F., Griffin, J., Lane, E.A., McAloon, C., O'Brien, K., Wall, P., Walsh, K.A., More, S.J., 2020. **Inferred duration of infectious period of SARS-CoV-2: rapid scoping review and analysis of available evidence for asymptomatic and symptomatic COVID-19 cases.** https://bmjopen.bmj.com/content/10/8/e039856

COVID-19 Related Research: Nicola Fletcher

→ When the university was closed in March due to COVID-19, and all research stopped, I got involved in contact tracing initially and then in training students to do SARS-CoV-2 PCR for the new testing laboratory in Enfer labs, Kildare. However, I had been involved in the characterisation of a novel antiviral formulation for Westgate Biomedical, who have labs based in UCD, for the past number of years and we had just completed a study demonstrating that this antiviral had activity against a number of viruses including some that infect the respiratory tract, namely measles and SARS. We decided to try to set up

some experiments at UCD to investigate whether this antiviral had activity against SARS-CoV-2, the coronavirus that causes COVID-19. After obtaining the necessary permissions to culture the virus in UCD's BSL-3 lab, I have started experiments to test the antiviral and our results so far have been extremely promising. The drug has shown an inhibitory effect that may prove a breakthrough in the potential treatment of COVID-19 in its early stages. The next step is to check that there is no toxicity before starting Phase One trials in a small number of volunteers, followed then by testing in people recently infected with COVID-19. The team is working hard to move through this process but a product launch may be still some way off as we have to be so careful to make sure the drugs we give patients are safe and effective and have minimal side-effects. It is a slow process but we need to be thorough.

Since beginning this work, as UCD currently has the only two BSL-3 labs in the Republic of Ireland with permission to culture SARS-CoV-2, I have become involved with several other projects, including a collaborative project with Prof Wim Meijer to investigate the presence of the virus in sewage and wastewater, which could provide an early warning system if Ireland were to have a second wave of the virus. We were recently awarded an SFI Rapid Response COVID-19 grant to carry out this work. I'm also involved with another SFI-funded project to develop antiviral packaging for food and other products. It has been a very busy and fast-moving time over the past few months, but it is exciting work and hopefully we will make discoveries that positively affect Ireland's response to this global pandemic.

Nicola Fletcher, Ad Astra Fellow, joined the UCD School of Veterinary Medicine in January this year. For more on Nicola's research in this area, see: https://www.ucd.ie/discovery/storiesofdiscovery/ucdresearcherfindsirishdrugworksoncovid-19.html

Student Summer Research Projects

Every year, staff in the School of Veterinary Medicine supervise students carrying out summer research projects. The aim is for students to get a flavour of what life would be like as a researcher - learning clinical, wet-lab or desk-based skills to design and analyse experiments and working as part of a research team; ultimately, students present their research at conferences and publish papers. This January, 2020 was looking like a bumper year in terms of the number of students planning to undertake research projects but then COVID-19 hit and everything had to change. Thanks to the adaptability and flexibility of our staff and students, clinical and lab-based projects were pivoted to become remote, desk-based projects, supervised over Zoom.

So how do you move a project meant to be in the field or the lab online? Many of the students are performing surveys. Some were meant to have an in-person element but they have now turned into online surveys. Many of the students are performing systematic reviews, where you use the information provided in existing published literature to answer your research question. Here the literature search itself is a 'repeatable experiment.' Other students have been able to use data previously gathered by researchers (in the clinic, lab or online) to perform computer-based analysis. The School's Parasitology section ran a 3-week online research elective to help their students learn about research careers, their research areas and research integrity.

Currently 28 students from Veterinary Medicine, Medicine and Science-based degree programmes are undertaking research projects in our School. Half of these students are also enrolled in UCD's Summer Student Research Awards (SSRA), a competitive programme to encourage students studying in healthcare disciplines to undertake research. Some of the topics under research include: the use of reflective practice in veterinary education, exotic pet ownership, bovine mastitis, the harm and benefit of canine chemotherapy, anti-microbial resistance in horses, using pupillometry to evaluate stress in tigers and the link between owner and pet health (more later).

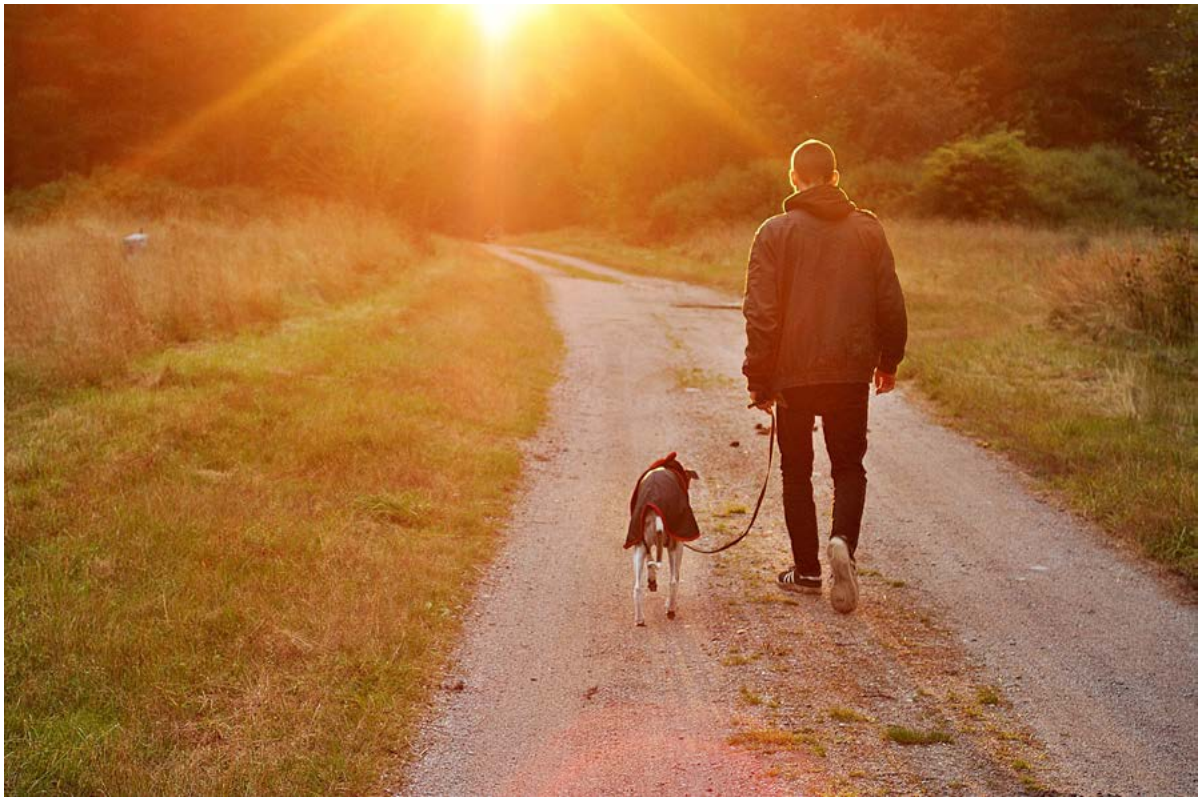
From a supervisor's perspective, it is an unusual experience to only interact with students virtually. I currently supervise a student based in Canada, who I discuss research with 2 to 3 times a week, but have yet to meet her in person. I have been extremely impressed with how much work the students have managed to achieve, their motivation and commitment to their research. I would like to thank my colleagues and the students for being so practical and adaptable with their projects. Such dedication and enthusiasm is what makes the School of Veterinary Medicine such a wonderful place to work.

Assistant Professor Alison Reynolds is a member of the School of Veterinary Medicine's Research, Innovation and Impact Committee, with oversight for summer research projects.

The Student's Perspective: A Study of Owners & Their Pet Dog's Health

SSRA students: **Sarah Barry** (final year Veterinary Medicine) & **Alex McMullin** (fourth year Medicine)

Supervisors: **Prof Cathy Kelly** (Consultant Oncologist, The Mater Misericordiae University Hospital) & **Dr Pamela Kelly** (Veterinary Pathologist, UCD)



→ Anyone who has owned a dog knows how strong the bond between an owner and their canine companion can be. Our aim with this SSRA project has been to look at this bond and to investigate the potential for utilising it to improve the health of both species. We aimed to assess whether owners are inadvertently impacting the health of their dogs, and whether educating them about this impact could change their habits to the benefit of both. We spent a number of weeks researching and developing an online questionnaire where we gathered data relating to the health of the dog owner, their dog and their willingness to alter aspects of their lifestyle for the benefit of their dog. Originally intended to be a clinic-based questionnaire, the switch to solely online has allowed us to reach a broader demographic with a larger number of respondents.

Two projects are being developed from this questionnaire. One focuses on the relationship between owner health and the health of their dog, with an emphasis on their cancer risk factors such as obesity, smoking, and lack of physical activity along with any chronic health issues of the owner. The second project encompasses the willingness of the owner to accept lifestyle changes based on being educated/made more aware of the impact that their health has on the health and wellbeing of their dog - thus ameliorating their own health as a result of these changes.

Working remotely on these projects was definitely a very different experience, however we managed to make it work well. Zoom calls were a huge help, with one student in Kerry and the other in Dublin, this was our saviour when discussing details and progress of the projects as well as for updating our supervisors. Shared Google applications like Docs and Sheets have also allowed us to really collaborate and share our work, even when operating at such a distance from each other. It was a great experience having both vets and medics being able to collaborate on the project even with all the challenges we faced. All in all, as our projects are drawing to a close and having never met each other in person, it certainly was not what we were expecting when we initially applied for the SSRA but we are proud of what we have managed to achieve under such unusual circumstances.

A Busy Year:

UCD Veterinary Hospital Large Animal Surgery Team Update

→ After a few quiet weeks when lockdown was first declared back in March 2020, the Spring season arrived with a vengeance and it's been all systems go for the **Large Animal Surgery (LAS)** team ever since. In spite of the uncertainty in the outside world, the last few months have been busier than ever, with the LAS team seeing cases of all shapes and sizes, and learning how to work within the COVID-19 restrictions.

While we have been missing our final year students, who usually play such an important role in the management of cases in the hospital, all credit for keeping the hospital running must go to the team of residents, interns and nurses, who have stepped up, working long hours and continuing to smile throughout it all!

Resident training is an important focus of the LAS team, and thanks to the varied caseload the LAS residents (**Siobhan McQuillan** and **Hanna Vermedal**) have managed to meet and exceed their training requirements for surgeries for this training year, and have logged some particularly interesting and complex cases in recent months. The residents have been involved in an increasing number of laparoscopy cases - from nephrosplenic space ablations, abdominal cryptorchids and uteropexies in horses, to ovariectomies in pet pigs. On the rise too, has been the number of complex fracture repair cases. Some recent examples include standing repair of a medial condylar fracture in a horse, internal fixation of a pelvic fracture in a pig with an LCP plate, repair of a bovine mandibular fracture with a type II external skeletal fixator and internal fixations of alpaca long bone fractures with LCP plates. Between these more unusual cases the team have continued to see more routine arthroscopies, dental cases and wind surgeries such as tie-backs (now performed under standing sedation at the UCDVH), in addition to the usual mix of emergencies such as colics, wounds and septic joints.

→ Preparing horse for colic surgery

The LAS residents have been well supported by their equine internal medicine resident colleague **Aine Rowe**, and our international team of interns – **Inês Carvalho**, **Chyanne Chandler**, **Marianna Pascariello** and **Marta Amandi Tomas**. Despite being 'stuck' in Ireland, with no immediate hope of a quick weekend visit home, our interns have been outstanding, working so hard to keep

→ **Post operative radiograph following repair of complicated radius fracture in an alpaca with a Locking Compression Plate.**

→ **Alpaca with fracture in picture 1 reunited with her cria after surgery**

everything running smoothly. And of course, nothing would happen without our nursing team – led by **Ann O'Brien** and **Kate Dolan** – keeping us on the straight and narrow.

All the work of the LAS Team has been greatly enhanced by the excellent facilities available in the UCDVH and through collaboration with the other specialist teams in the Hospital, particularly colleagues in Anaesthesia, Equine Medicine, Diagnostic Imaging, Farm Animal Clinical Studies and Small Animal Surgery.

We have also been lucky in these months to have the usual team of surgeons (John Mark O'Leary, Clodagh Kearney and Pieter Brama) bolstered by the timely arrival of Warren Schofield. We are grateful to Warren for contributing immensely to the clinical service over the past six months while Clodagh undertook a research sabbatical. Having undergone his residency training at UCD, since 2000 Warren has worked in busy private practice at Troytown Greyabbey Equine Hospital on the Curragh and currently works as an independent equine veterinary consultant, specialising in surgery and racehorse orthopaedics. Warren's return to UCD – 20 years on (!) - has been most welcome, and the residents have learned much from his depth of experience.

From the Archives:

New Dean for Merged Faculties (UCD News, February 1978)

The February 1978 edition of UCD News was a special feature edition on 'The Vets.' The UCD News team visited the Vet College in Ballsbridge and also the field stations at Kilkieran and Chantilly to speak to members of staff and student representatives. As part of this, they interviewed the 'New Dean for Merged Faculties,' Justin Keating. Many of the topics covered in this interview are still familiar to us today - school leavers accessing the Veterinary Medicine programme and advice for those considering applying, gender representation on programmes and international students. Whilst there have been changes in many of these areas since then, what has remained the same is the enthusiasm and commitment of staff in the Vet School highlighted at the end of the article.

Born in Dublin, he was educated at Sandford Park before coming to the Veterinary College in 1946. He won the Evans Studentship awarded to the student with the best record in the first four years. Following his graduation in 1951, he worked as a Research Scholar, Animal Health Trust, at University College, London. Returning to Ireland, he was appointed Lecturer in Veterinary Anatomy in the Veterinary College. In 1960, he became Senior Lecturer-in-charge, Sub-Department of Veterinary Anatomy, T.C.D.

From 1965-67, he obtained leave of absence to take up an R.T.E. appointment as Head of Agricultural Broadcasting and Consultant on Adult Education. Among the awards he received for his journalistic work were the Silver Ear of Corn Award from the Berlin Festival of Agricultural Films, the Glaxo Award for Agricultural Journalism and the Jacobs Television Award.

Entering the political arena, he was elected as T.D. for North County Dublin in 1969. In the Coalition Government, he held Cabinet rank as Minister for Industry and Commerce 1973-1977. In 1977, he was appointed to the Seanad and elected Dean of the Veterinary Faculty. He is married with two daughters and one son.

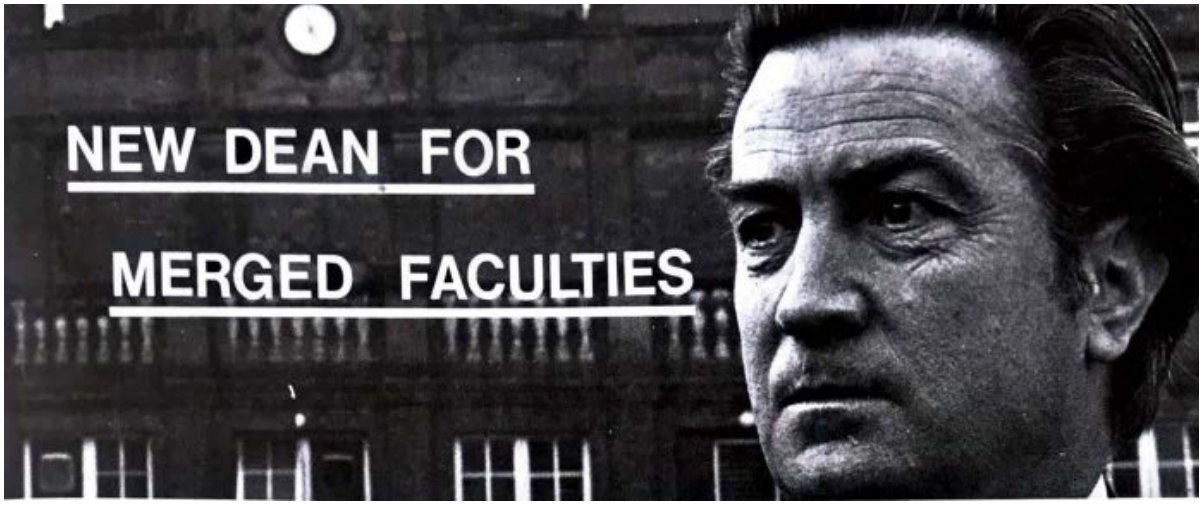
UCD NEWS talked to Senator Keating in his office and in the Faculty grounds at Ballsbridge.

What attributes would be most helpful to the school leaver thinking of taking up Veterinary Medicine as a career?

That you know you want to do it, and that you have a sufficiently high academic standard. It is important to have a real idea of what the veterinary profession is and does. It is not all Herriot.

Women students are a small minority in the Faculty. Is this associated in any way with the desirability of physical strength in a vet?

The percentage of women is increasing, though it is still low. The difficulties that women find in large animal practice are more because of the attitude of (male) clients than because of lack of physical strength. In all other branches of the profession, and these with the passage of time become more and more important relative to general practice, women are as good as men in every way.



The Faculty does not admit foreign students. Is this a matter of policy and, if so, could you explain its basis?

It is a matter of part policy which I am glad to say we are in the process of ending. Veterinary education is very expensive but we have a duty in this regard to the less fortunate parts of the world. The two provisos are that our effort must be on a realistic scale and it must be targeted towards places which have a special need and where we have a special contact and interest.

Our veterinary students have availed of opportunities to work abroad with overseas vets. I understand that there is some difficulty in persuading Irish vets to accept foreign students on a similar basis. Assuming that these exchanges have some educational value, is there anything that can be done to promote them?

Movements of the young, veterinary students or anyone else, have an important educational value. Our students are courageous travellers, and good for them. We do have arrangements, operated through individual professors who have particular contacts with particular foreign countries, to fix up foreign veterinary students who want to see practice here. I believe that this works well, but I'm sure that if the Faculty were persuaded that a real and currently unsatisfied overseas demand exists, we would be happy to make more formal efforts to meet it.

I understand that the long term plan is to move the Faculty on to the Belfield campus retaining at least one Clinical Field Station. How do you view this move?

I view the projected move to Belfield with unconcealed delight. In Ireland agriculture is, and will always remain, exceptionally important. In our context, overwhelmingly, agriculture means livestock. It has been so since the days of the Brown Bull of Cooley. As the profession which provides the "efficiency engineers of the livestock industry," we will always have an importance in Ireland relatively greater than in other developed countries. We have large numbers and a wide range of livestock, and we can have no realistic objective as a Faculty other than to be one of the handful of "best in the World" schools. This has two essential preconditions: a place on the campus of a university and a Field Station/Hospital with access to large numbers of animals, and with good farming practice in its immediate hinterland. I believe we are on the way to meeting these two preconditions .

Being the only Veterinary Faculty in Ireland, external examiners must travel relatively long distances compared to other College faculties. Are there other problems associated with being unique?

The problems of being unique, apart from minor organisational ones, arise from the lack, within our own boundaries, of other schools to measure ourselves against. This simply means that we must build a good graduate school with a lot of exchange of professional people, and also that we must travel a lot - faculty members as well as undergraduates.

The Faculty offers a relatively long course, small classes, and practical work - are there any other factors operating which would explain the harmony in staff-student relations apparent to the visitor?

I believe that we have good student/staff relations, and I'm delighted if it is evident to the visitor. Apart from the reasons mentioned in the question we have a very well educated, widely travelled and passionately committed Faculty who see, at last, the chance to build a very good school indeed. Enthusiasm and commitment are infectious.

School Research

Research at a glance:

→ School research income

Over the last 5 years
- **153** research projects
- **€19.4 million** in research funding
- **Department of Agriculture, Food & the Marine, Science Foundation Ireland and Teagasc** have been the main funding sources

During 2019-20
- **18** new externally funded research projects
- **€3.4 million** in new externally funded research funding

School Research Output
- **212** scientific publications in 2019, including 177 journal articles
- A field-weighted citation impact during 2014-18 of 1.66, compared with a world average of 1.0

→ Research Highlights

Inflammation

Recently appointed Assistant Professor in Small Animal Internal Medicine, **Benoit Cuq** and his team are investigating the mechanism of inflammation in primary immune-mediated haemolytic anaemia (IMHA) in dogs through microRNA evaluation. They are assessing whether micro-RNAs known to play a key role in the dysregulation of Th17 (a subtype of T-helper cells) and its effects to produce a pro-inflammatory cytokine IL-17 in human IMHA has a similar association in dogs with primary IMHA.

Infection

Professor **Simon More** leads the Centre for Veterinary Epidemiology and Risk Analysis (CVERA). CVERA provides scientific advice in support of national policy decision making in many aspects of animal health and welfare. Recent publications from this team include a number of bovine disease topics (bovine Tuberculosis and its eradication, case detection of Johne's disease and the role of Trojan Dams in the Bovine Viral Diarrhoea Eradication programme).

Assistant Professor in Veterinary Pathology, **Dr Pamela Kelly's** research involves collaborative human and veterinary investigations into the role of Demodex mites in human rosacea and the innate immune response in canine demodicosis.

Sustainability

Full Professor of Animal Genomics, **Torres Sweeney** and her research team are focusing on sustainable animal production using a spectrum of 'omic' technologies (genomics, transcriptomics and epigenomics) to understand the biology of certain traits and how nutrition influences their expression. Firstly, hard to measure traits in food animals such as feed efficiency, greenhouse gas emissions, longevity, milk and meat quality are being assessed. The second objective is to provide the optimum health and welfare by designing optimum diets.

Associate Professor **Finbar Mulligan** highlights the importance that quality dairy production in Ireland is sustainable from an environmental and animal health point of view. Professor Mulligan and his team at UCD Lyons farm are investigating the potential of multispecies swards with grazing systems to reduce the environmental footprint of milk production compared to traditional perennial ryegrass based systems. Research at Lyons farm is also investigating the status of rumen acidosis with different diets and the role of low rumen pH in milk fat suppression using 'Rusitec,' a simulated rumen fermentation system.

Surgery

Following on from his previous publications on the incidence and short term survival of post-attenuation neurological signs following surgical correction of

153

SCHOOL RESEARCH PROJECTS COMPLETED OVER THE LAST 5 YEARS

€19.4M

RESEARCH FUNDING OVER THE LAST 5 YEARS

212

SCIENTIFIC PUBLICATIONS IN 2019, INCLUDING 177 JOURNAL ARTICLES

18

NEW EXTERNALLY FUNDED RESEARCH PROJECTS IN 2019-20

congenital portosystemic shunts, Assistant Professor of Small Animal Surgery, **Dr Ronan Mullins** is leading a multi-institutional investigation into the long term survival and outcome of these dogs.

Assistant Professor of Small Animal Surgery, **Stephen Martin** is leading a collaborative study with the UCD School of Mechanical and Materials Engineering and Koret School of Veterinary Medicine on canine elbow dysplasia.

Articles on the above research projects were featured in the Veterinary Ireland Journal, July 2019 – July 2020 and can be accessed on our website: https://www.ucd.ie/vetmed/research/connectwithus/

→ Recent Postgraduate Successes

Our recent postgraduate successes demonstrate the breadth of research being undertaken at postgraduate level in the School of Veterinary Medicine. Detailed below are just some of the projects completed in the School in recent months - well done to the graduates and to all of those involved in their research projects.

→ Damien Barrett

Damien Barrett, a superintending veterinary inspector in the Dept of Agriculture, Food and the Marine, was recently awarded a PhD for his thesis on 'The epidemiology of the emergence and re-emergence of Schmallemberg virus (SBV) in Ireland.' The thesis was supervised by Professor **Simon More**, **Dr Donal Sammin** and **Dr Ronan O'Neill**. SBV was the first midge borne disease to affect ruminants in Ireland, and while it is considered a disease of limited impact, it has a similar epidemiology to Bluetongue virus which has a much greater economic significance. The study found geographical exposure to SBV following its initial emergence in 2012 and its re-emergence in 2016, was predominately in the south east, but it moved farther North west following its re-emergence in 2016. Weaning rates among sheep flocks affected by SBV were 10% less than those of non affected flocks. Analysis of milk yield data from 600 herds in the south east found a reduction in milk yield in the four weeks following the emergence of SBV in 2012. Analysis of cow behavioural data in a large herd found evidence of behavioural changes consistent with malaise around the time SBV re-emerged in 2016. The findings are of interest to SBV in its own right but are also of relevance to surveillance for other widespread epizootic disease outbreaks.

→ Rebecca Carroll

Rebecca Carroll successfully completed her thesis for a Master's Degree (Research) in Veterinary Medicine last October, with **Dr Locksley Messam** as her primary supervisor. Rebecca's thesis is titled 'Using abattoir surveys to estimate the prevalence and economic impact of disease while accounting for bias.' This work provides guidelines for researchers conducting abattoir surveys to help minimise bias. It also estimates the cost of liver fluke infection to beef farmers and quantifies the impact of bias on these results. Rebecca undertook this work while working as the Beef HealthCheck Programme Manager for Animal Health Ireland. Beef HealthCheck is a national programme capturing, analysing and reporting abattoir data from post-mortem meat inspection. This work provides a sound basis for further research from this valuable programme. Rebecca is now working as a Veterinary Inspector with the Department of Agriculture, Food and the Marine.

→ David Folan

David Folan, who is originally from Donegal, graduated with a PhD last December. David has been based in the Veterinary Biosciences Section at the School of Veterinary Medicine since 2014. He completed an MSc in Microbiology in 2016, before undertaking a three year PhD, majoring in Infection Biology (School of Medicine). Both degrees were supervised by Professor **Alan Baird**. David's work focuses on the development of applications and delivery systems of novel antimicrobial nanoemulsion, SALTech, for the treatment of dermal infections and diseases of the skin.

→ Sinead Hallinan

Sinead Hallinan is from Dublin and has recently graduated with an MSc in Biochemistry. Her research was completed in the National Institute for Bioprocessing Research and Training under the supervision of Professor **Mark Crowe** from the School of Veterinary Medicine. It was undertaken as part of the GplusE project, an EU funded effort to link phenotypic and genomic data to optimise the health, welfare, fertility and production efficiency of dairy cows. Sinead's thesis, entitled 'Bovine Milk IgG N-glycosylation and its Ability to Predict Disease in Dairy Cows,' focused on characterising the sugar structures attached to immunoglobulin proteins found in bovine milk and determining whether they had the potential to predict disease in dairy cattle. This work included the first known structural characterisation of the N-glycome of bovine milk immunoglobulin G.

→ Amalia Naranjo Lucena

Amalia Naranjo Lucena graduated as a veterinarian in 2013 from the University of Córdoba before also completing a Masters degree in Biotechnology there. Her PhD research at the UCD School of Veterinary Medicine was supervised by Professor **Grace Mulcahy** and **Dr Annetta Zintl**. Amalia's thesis entitled 'Epidemiological and Immunological Consequences of the Co-infection of *Fasciola hepatica* with *Calicophoron daubneyi* and *Mycobacterium avium sub-species paratuberculosis* (MAP)' was funded by the EU H2020 PARAGONE grant. The effects of liver fluke on concurrent rumen fluke infections and the progression of Johne's disease were explored using a multidisciplinary approach involving spatial predictive modeling, *in vitro* cell culture experiments and immunohistopathology. The outcomes of Amalia's research will aid the prediction of epidemiological changes due to varying climatological and environmental conditions, and the design of disease control programmes.

→ Dagmara Niedziela

Dagmara Niedziela recently graduated with a PhD in Infection Biology under the supervision of **Dr Finola Leonard** from the School of Veterinary Medicine and Dr Orla Keane from Teagasc. Her project 'Strain-specific virulence of *Staphylococcus aureus*' aimed to increase the understanding of the way different strains of this bacterium cause bovine mastitis. Two bacterial strains were found to cause very different disease outcomes in cows, with one strain causing a high immune response and the occurrence of clinical signs, and the other strain causing mild and subclinical mastitis. Transcriptomics analysis was performed to find potential biomarkers of *S. aureus* infection. The findings of Dagmara's project could influence detection, treatment and vaccination for mastitis in the future. Funding for the project was provided by the Department of Agriculture, Food and the Marine.

→ Elvira Ramovic

Elvira Ramovic, originally from Bosnia and Herzegovina but settled in Ireland since 1999, successfully defended her PhD thesis entitled 'An evaluation of diagnostic tests and some environmental factors relevant to Johne's disease control in Ireland.' Her research was part of a larger project aimed at assisting the national Johne's disease pilot control programme funded by the Department of Agriculture, Food and the Marine. The work was completed in the Central Veterinary Research Laboratory in Backweston under the supervision of Associate Adj. Prof. **John Egan**, with Associate Prof **Bryan Markey** from UCD acting as principal supervisor. The thesis provided significant information on the merits and limitations of various diagnostic tests in Johne's disease diagnosis and control, and the potential role of environmental dust as a source of infection.

Thank You to…

Over the last few months, members of the UCD Veterinary Community have gone above and beyond in their efforts to help others in any way they can. These are just a few examples of what some of our community members have been involved in.

We'd like to say a huge thank you / go raibh maith agat to everyone across the UCD Veterinary Community who has joined local and national efforts in the face of the COVID-19 pandemic.

…our UCD Veterinary Community

Thank you
Go raibh maith agat

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