

Researchers play important role in combatting the pandemic



Researchers from the School of Veterinary Medicine have been playing their part in trying to combat the Covid-19 pandemic

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As the Covid-19 pandemic unfolded across the world, funding agencies scrambled to provide 'rapid-response' funding mechanisms to support the research community in the effort to understand the biology of SARS-CoV-2, the epidemiology of infection, and to identify mechanisms and technologies to aid in the diagnosis, prevention, and treatment of infection. Ireland's rapid-response funding came from a collaboration between Science Foundation Ireland (SFI) and the Health Research Board, provided in two tranches throughout 2020. A broad swathe of the academic research community responded, with applications ranging from the social sciences, through medical interventions, epidemiology, public health, and basic biological sciences. Through a competitive international evaluation exercise, projects selected for funding began contributing to the national and international effort to combat the pandemic.

THE VETERINARY COMMUNITY RESPONDS

Researchers within the UCD School of Veterinary Medicine joined the call to action, resulting in a number of significant ongoing initiatives. Leading the charge on a number of these is Dr Nicola Fletcher, virologist, veterinarian, and recent appointee as lecturer/Ad Astra Fellow in the school. Nicola's career has led her from a BSc. at the University of Limerick; through a PhD in neuropathology in the vet school; post-doctoral positions in UCD and the University of Birmingham;

1	Sampling and testing the workforce
2	Risk assessment of operational factors
3	Monitoring and assessment of environmental factors
4	Wastewater monitoring as an early warning system
5	Whole genome virus sequencing and diagnostic assay platform development
6	Survival of SARS CoV-2 on biotic and abiotic surfaces
7	Validation of alternative environments for meat cutting
8	Data analysis to mine and model information
9	Dissemination and application

Figure 1: Workplan for UPCOM – Understanding and Preventing Transmission of SARS-CoV-2 in Meat Processing Plants – Prepared for the Future.

qualifying as a veterinary practitioner in UCD; working in research and diagnostics in the Animal and Plant Health Agency in the UK; and finally back to her current position. Her current Covid-19 – related research projects include looking at the neurological impacts of SARS-CoV-2 infection, and she is also collaborating in projects investigating the use of wastewater in surveillance for levels of SARS-CoV-2 within communities, on the sourcing of scarce reagents for diagnosis, and several others. Nicola's inputs are especially valuable given her access to the high-containment (CL3) laboratory in the school, and her expertise with working with live virus in this environment.

QUANTIFYING AND COMBATTING THE RISK OF SARS-COV-2 IN MEAT-PROCESSING PLANTS

One of the high-risk environments vulnerable to super-spreading events, demonstrated by events in Ireland and overseas, are meat processing plants. There are multiple reasons for this, including the requirements of the working environment, ventilation, noisy environments, and numbers of people per area. In recognition of the risks of amplification of infection, once introduced from the community in such environments, SFI has funded a rapid-response research project on 'Understanding and Preventing Outbreaks of Covid-19 in Meat Processing

Plants – Prepared for the Future (UPCOM)'. The co-principal investigators on this project are Grace Mulcahy (School of Veterinary Medicine) and Seamus Fanning (School of Public Health, Physiotherapy and Sports Science). Other veterinary involvement includes Donal Sammin, adjunct professor in the School of Veterinary Medicine and head of laboratories, Department of Agriculture, Food and the Marine; along with School investigators Gerald Barry, Nicola Fletcher, Nicola Walshe and Paul Whyte. In total, in addition to UCD, the project benefits from input from UCC, DCU and RCSI, and has links to a number of relevant public-sector agencies, Meat Industry Ireland and Food and Drink Ireland, as well as academic and industry collaborators in Germany. UPCOM aims to consider this problem from a number of angles, ranging from quantifying the benefit of rapid antigen testing in meat-processing plants, through to understanding airborne transmission in these environments and its mitigation, operational factors contributing to risk, sequencing of virus isolated in plants to map spread at a molecular level, the potential of wastewater surveillance as an early-warning system, and survival of virus on biological and non-biological surfaces. Crucially, the project will also benefit from the inclusion of a team of data scientists from the SFI-funded data analytics centre at DCU. Led by Dr Andrew McCarren, this team will use machine learning to ensure