

Appendix A. Supplementary data

Submitted talks

SARS-CoV-2 & COVID-19

This section was subdivided into 5 sessions: *Disease and pathogenesis*, *Immunity*, *Diagnosis & intervention*, *Molecular virology*, and *Transmission & epidemiology*. A total of 9 submitted talks were provided in the first session about ***Disease and pathogenesis***. These talks reported the effects of SARS-CoV-2 infection on disease outcomes; analysis of the effects of infection on the psychological health and performance of medical students by Nada Eidhah Algethami, effects of disease on cerebral activity by Raphael Gaudin, gastrointestinal symptom predictors of disease outcome by Ghoshal Ujjala, and COVID-19 in the Makkah and high altitude regions of Saudi Arabia, by Fathiah Zakham and RMM Althaqafi, respectively. There were also studies on the effects of inflammatory cytokines as mediators of disease severity by Tracey L. Freeman, comparative analysis of cytokine storms in hospitalized versus non-hospitalized patients by Zaiga Nora-Krukle, detection of virus in various clinical samples by Liba Sokolovska, and analysis of persistent/ chronic infections by Anda Vilmane.

The **session on SARS-CoV-2 immunity** comprised 7 talks on the serological cross-neutralization of SARS-CoV-2 spike and NP proteins by Huttunen Moona, neutralization of SARS-CoV-2 variants with BNT162b2 mRNA COVID-19 vaccine by Pinja Jalkanen, pediatric 82% seroprevalence and disease burden of seasonal human coronaviruses by Pekka Kolehmainen, similar immune responses to SARS-CoV-2 or vaccines in HIV-positive versus -negative patients by Jumari Snyman, development of pseudovirion-based immunosensors for SARS-CoV-2 by Maria-Cristina Navas, identification of novel epitopes in SARS-CoV-2, targeted for vaccine development by Shailendra Saxena, and characterization of SARS-CoV-2 antibodies in COVID-19 patients in Latvia by Samanta Strojeva.

The ***Diagnosis & intervention*** session had 8 talks describing the development of a sensitive and specific automated antigen test for SARS-CoV-2 (mariPOC®) by Janne O. Koskinen, a SolaVAX whole-virion SARS-CoV-2 vaccine by Izabela Ragan, an intranasal vaccine with ChAd-SARS-CoV2-S by Ahmed Hassan, compounds that block the binding of SARS-CoV-2 with ACE2 by Benjamin Bailly, fusion inhibitory peptides for SARS-CoV-2 infection by Said Mougari, an engineered water nanostructure-based surface disinfection technique against coronaviruses by Anand Soorneedi, and inhibition of SARS-CoV-2 by bismuth drugs by Tao Xuan, and by the ATPase blocker diphyllin by Štefánik Michal.

Five talks were delivered in the ***Molecular virology*** session. The research presented included analysis of cellular factors required for virus replication, by Aleksandra Synowiec, ARF6-dependent endocytosis into HUH-7 hepatoma cells of SARS-CoV-2, by Carmen Mirabelli, the inhibition of replication using PAMPS-PAaU, by Botwina Pawel, syncytia formation by SARS-CoV-2 variants, by Maaran Rajah, as well as molecular barriers to SARS-CoV-2 in bat cells, by Sophie-Marie Aicher.

Lastly, the session on ***Transmission & epidemiology*** included 5 talks on SARS-CoV-2 concentration for wastewater-based epidemiology by David Goad, wastewater processing for SARS-CoV-2 detection by John Dennehy, viable SARS-CoV-2 particle detection in aerosols, by Fabrizio Spagnolo, and in bivalve mollusks and marine sediments by Jesús Romalde. Finally, William Wilson described the potential role of insect vectors on SARS-CoV-2 transmission.

Human Virology

This theme comprised 3 sessions: *Clinical virology*, *HIV & hepatitis*, and *Molecular virology*. The ***Clinical virology*** track comprised 15 talks on persistence of parvovirus B19 in blood vessels and lymphoid follicles of the intestinal mucosa by Man Xu, on high prevalence of viral DNAs in the

human body by Lari Pyöriä, on rotavirus genotyping in children from severe diarrhea in Nigeria by Babalola Oluyemi, on the modular norovirus-like particle vaccine platform by Vili Lampinen, and on polynuclear platinum complexes (PPCs) as antiviral agents on viruses by shielding cells from virus entry, by Benjamin Bailly. The short talks included the use of a nanopore-based sensing technology for real-time detection of noroviruses by Minji Kim, epidemiology of group A rotaviruses in children under 5 in India by Yengkhom Devi, a multiplexed high-throughput serological assay for human enteroviruses by Niila Saarinen, re-infection or re-activation of human bocavirus 1 resulting in neurological deficits and deaths of two young adults by Rajita Rayamajhi Thapa, how viruses may affect cardiac inflammation and myocarditis by Ashwin Badrinath, a positive correlation between EBV and dengue 2 virus infection and in human specimens by Xiao-Mei Deng, an *in-silico* approach to designing subunit-based Zika-virus vaccines by Ezzeman Wahiba, an *in-silico* alternate mechanism for development of anti-influenza virus molecules by Priyanka Saha, inactivation of foodborne viruses with cinnamaldehyde nanoemulsions by Pragathi Kamarasu, and hospital experiences with parvovirus B19 infections and how this could lead to better diagnosis and management by Nema Shashwati.

The **HIV & hepatitis** session comprised 7 talks, on HIV-exposed seronegative women expressing high levels of regulatory T cells and low immune activation in the cervical mucosa, by Kristina Broliden, cytotoxic T cell-epitopes of HIV polymerase during early and chronic infection, by Paballo Nkone, diarrheal HIV patients that have frequent co-infection of cosavirus of the *Picornaviridae*, by Esmeralda Vizzi, inflammatory biomarkers and the impact of antiviral therapy in Moroccan HIV patients, by Haddaji Asmaa, the genotypes and drug resistance mutations of hepatitis C virus in Colombia, by Maria Lopez-Osorio, co-infection of hepatitis B and delta viruses as a public-health issue in Colombian indigenous communities, by Melissa Montoya, and the association between TLR4/TLR9 polymorphisms and the risk of hepatocellular carcinoma in Morocco by Zerrad Chaimaa.

A total of 14 submitted talks were provided in the ***Molecular Virology*** track on virus-host interactions involving miRNA profiling of rotavirus-infected cells by Irene Hoxie, in-situ imaging of cutavirus in cutaneous T-cell lymphoma lesions by Ushanandini Mohanraj, characterization of adenoviruses in South Africa by Michaela M. Davids, use of magnetic ionic liquids to concentrate nonenveloped viruses by Sloane Stoufer, the use of oncolytic MVM parvoviruses for anticancer applications, by T. Calvo-López and Carlos Gallego-García, characterization of enterovirus D68 structural protein by Jacqueline S. Anderson and enterovirus D94 entry by Jianing Fu, virus-host interactions of herpes simplex 1 by Jingjing Li and Xueying Liang, the role of host factors in pathogenesis of hepatitis viruses by Tanouti Ikram-Allah and Abounouh Karima, the role of HIV infection on modification of host mRNAs by Masyelly Rojas, and the role of host factors in development of AIDS by Meryem Bouqdayr.

Zoonotic Virology

The abstracts on zoonotic viruses were divided into 2 sessions: *Clinical and Molecular virology*. The ***Clinical virology*** session included 10 submitted talks, covering the zoonotic impact, epidemiology, and control of camel pox by Ahmed Elhag, small molecule-based inhibitors of emerging RNA viruses by Ludec Eyer, knowledge of Chikungunya virus in medical students in the Caribbean's, by HP Nepal, the WNV circulation in Lebanon by Nabil Haddad, new surveillance approaches for tick borne encephalitis virus by Arnoldas Pautienius, the cache valley virus and Jamestown Canyon virus mosquito vectors across North America by C Dieme, effects of Zika virus infection on RNA editing, inflammatory and antiviral responses in *Aedes albopictus* by Maria Onyango, the incidence of Sindbis virus in hospitalized patients with acute neurological signs in South Africa by Kgothatso Meno, quantification of the transcriptional response of human macrophage cells infected with CHIKV by Madison Gray, and first detection of lymphocytic choriomeningitis virus in neurological cases in Iraq by Hussein Alburkat.

The ***Molecular virology*** session included 11 talks on filovirus VP24 proteins regulating Rig-I and MDA5-dependent IFN- λ 1 promoter activation by Ilkka Julkunen, the structural landscape of dengue- and Zika-virus antibody repertoire by Madhumati Sevana, mutations within the prM and E protein transmembrane helices disrupting infectious flavivirus particle formation by Conrad Nicholls, AaFurin1 that may have a role in proteolytic cleavage of arboviruses in mosquitoes affecting their infectivity by Carlos Brito-Sierra, new insights into flavivirus biology through high-resolution EM structures of Usutu virus by Baldeep Khare, and the molecular mechanisms of inhibition of tick-borne encephalitis virus by monoclonal antibodies by Daniel Ruzek. Brief reports were also included in this session, on the genetic and in vitro biological characterization of tick-borne Třebeč orbivirus, by Tomáš Csank, the role of filovirus VP24 proteins on interferon-induced innate-immunity pathways by Hira Khan, the genomic and structural characterization of Dobrava-Belgrade orthohantavirus in Turkey by Mert Erdin, the anti-chikungunya potency of thymoquinone, a natural drug compound targeting the capsid by Ravi Kumar, and chikungunya antiviral therapy targeting the stress response pathway, by Supreeti Mahajan.

Animal Viruses/Veterinary Virology

This section was subdivided into four sessions: *Molecular virology*, *Veterinary virology*, *Epidemiology*, and *Novel or endogenous viruses*. Five talks were submitted to the ***Molecular virology*** session covering the characterization of the capsid structure of a novel insect parvovirus by Judith Penzes, the effect of a key signaling protein (protein kinase B) during infection of murine noroviruses by Irene Owusu, the molecular characterization of the bovine Lumpy skin disease, by Shashi Sudhakar, the expression profiles of toll-like receptors of Koala retroviruses by Mohammad Kayesh, and the functions associated with canine parvovirus NS2 in the modification and egress of mRNA, by Salla Mattola.

Three talks of the ***Veterinary virology*** session were about vaccines; the development of an inactivated pentavalent Indian vaccine against Bluetongue virus by Minakshi Prasad, the development of an effective cell culture-adapted attenuated vaccine for African swine fever virus by Manuel Borca, and vaccine cross-protection against circulating canine parvoviruses by Karmar Kour. The three other talks presented the virulence of different viral haemorrhagic septicaemia viruses affecting over 32 fish species, and host responses by Bartolomeo Gorgoglione, the emergence of Tilapia tilapine- and parvoviruses responsible of economic losses by Win Surachetpong, and the expression of glycoprotein in diagnostic tests for the porcine reproductive and respiratory syndrome virus by Fatema Akter.

The ***Epidemiology*** session comprised 8 talks, presenting surveys of Bluetongue virus in ruminants of Morocco and camels in Sudan by Soukaina Daif and Shamsaldeen Saeed, respectively, a survey of neurological Middelburg and Sindbis alphavirus in equine and wildlife species in South Africa by Elise Bonnet, a study on the prevalence and evolution of low-pathogenic avian influenza H9N2, affecting poultry in Morocco by Fatima-Zohra Sikht, the first detection and whole-genome analysis of three low-pathogenicity avian influenza viruses in Peru by Gina Castro-Sanguinetti, a surveillance study of West Nile virus in animals displaying neurological disease in South Africa by Caitlin MacIntyre, the epidemiological and molecular characterization of canine bufavirus and cachaviruses in grey wolves from Canada by Kelsi Fry, and molecular characterization of canine parvovirus-2, causing hemorrhagic gastroenteritis in domestic dogs in Caribbean island of Nevis by Kerry Gainor.

The session on ***Novel and endogenous viruses*** included 8 talks about metatranscriptomics from 711 arthropod species, uncovering over 1300 novel RNA viruses by Tianyi Chang, the discovery of a novel fox protoparvovirus, prevalent in Canada by Marta Canuti, the transmission mode and pathogenesis of Koala retroviruses in joeys from Japan, by Abul Hash, the seroprevalence and

sequence of atypical porcine pestivirus circulating in Swedish wild boars by Hedvig Stenberg, the phylogenetic characterization of a Bagaza virus from the Himalayan monal pheasant with neurological signs in South Africa by Adriano Mendes, the identification of a novel iridovirus in deep-sea cladorhizid sponges by Gabrielle Large, the development of a rhabdovirus nested RT-qPCR identifying a novel vesiculovirus from bats in the Mediterranean region by Dongsheng Luo, and the non-primate hepacivirus spillover in horses and dogs in Morocco, by Islam Abbadi.

Plant Virology

Interesting studies were also presented by 12 speakers on *Novel plant viruses* and *Molecular plant virology*. The first session on ***Molecular virology*** contained 7 talks, which included major developments related to determination of virus-triggered metabolic adjustments to infection by Richard Manasseh, interplay between the host proteins and viruses like potato virus Y by Gnanasekaran Prabu, silencing suppressor and virulence functions of begomovirus-coded proteins by Zhai Ying, demonstration of a novel pro-viral role of host ARGONAUTE1 by Pollari Maija, that virus-coded RNase III (CSR3) suppresses antiviral RNA silencing defense of plants by Linping Wang, the use of RNA interference (RNAi) to manage diverse viruses by Basavaprabhu Patil, and transcriptomic Response to Begomovirus infection in vector *Bemisia tabaci* by Aarthi Nekkanti.

The ***Novel virus*** session comprised 5 talks about robust diagnostic systems by Susheel Kumar Sharma, RNA datasets having helped in the identification of known and novel and putative novel viruses infecting important crops like spices by Ishwara Bhat, common bean by Aflaq Hamid, and endangered plant species by Kavi Sidharthan; and detection of infectious plant viruses and monitoring of SARS-CoV-2 in wastewater by Ravnika Maja.