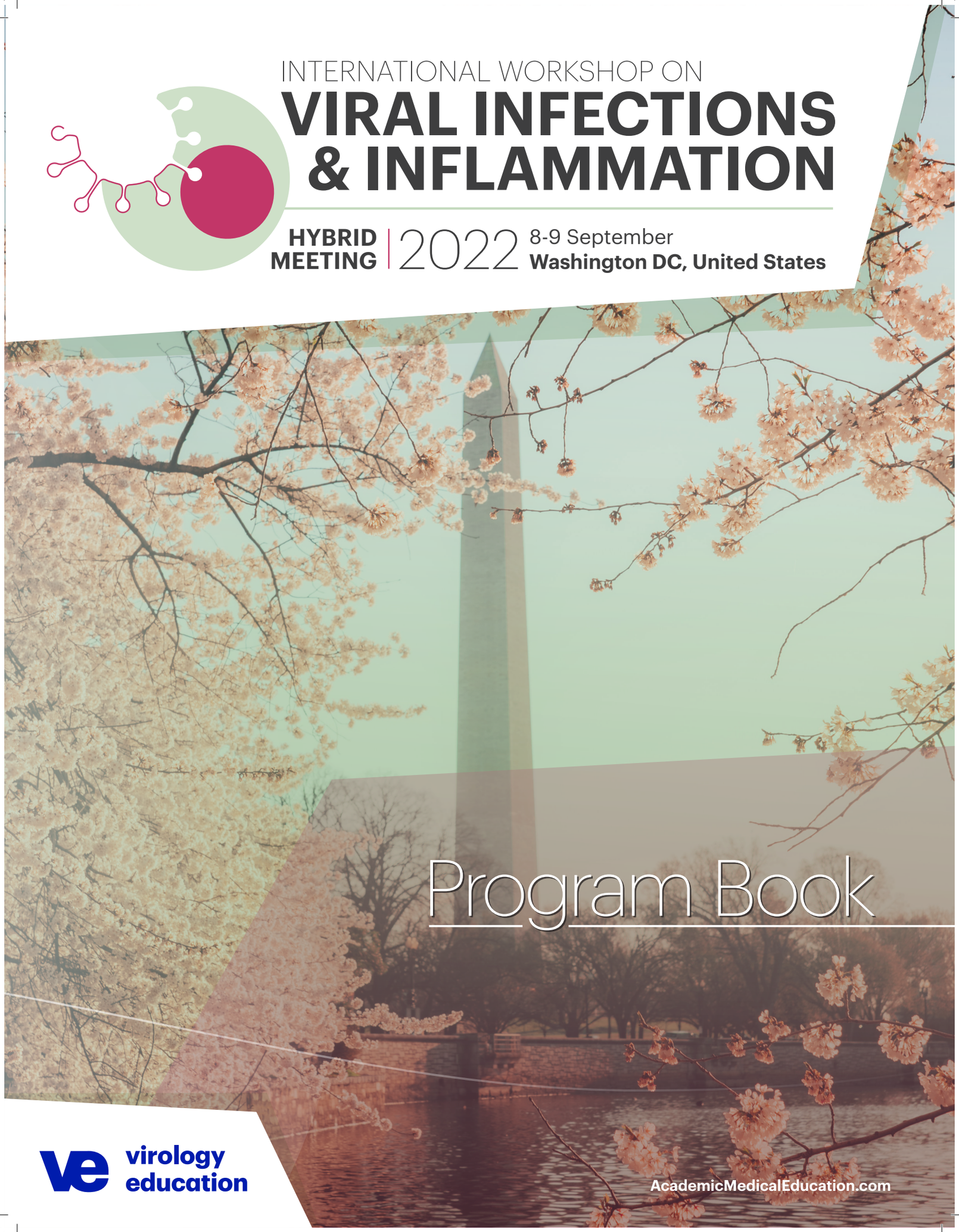
INTERNATIONAL WORKSHOP ON

VIRAL INFECTIONS & INFLAMMATION

HYBRID MEETING | 2022 8-9 September **Washington DC, United States**



Program Book

virology education

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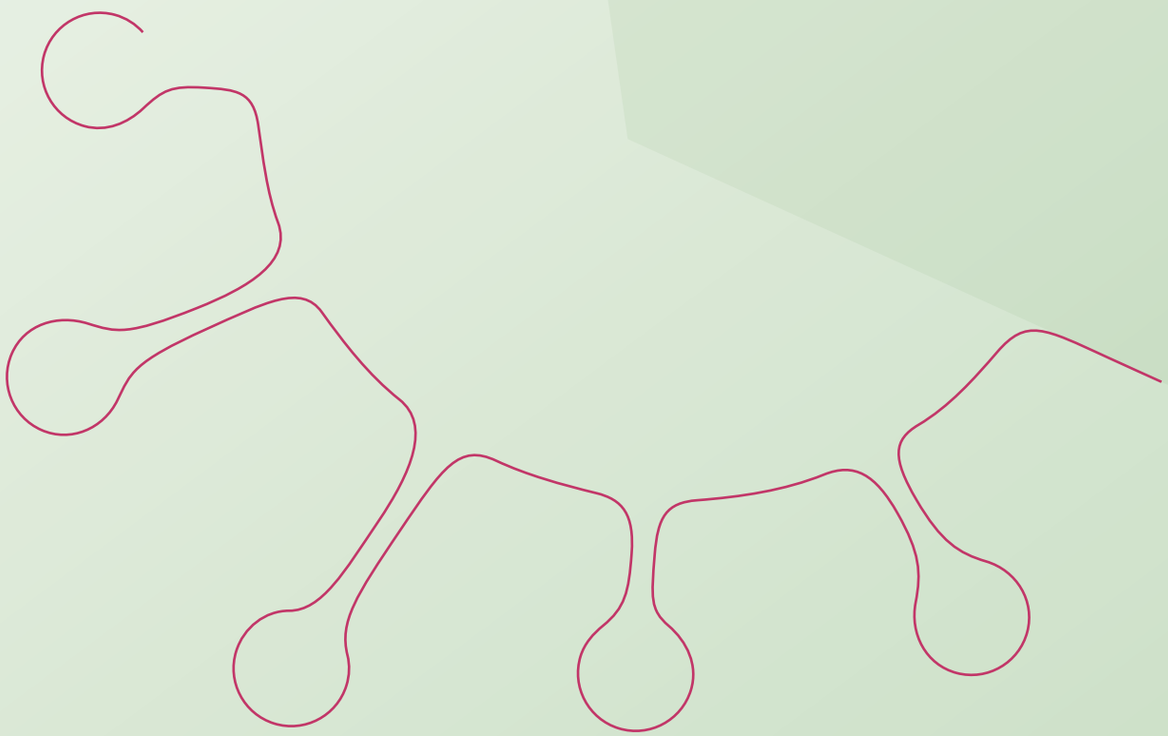
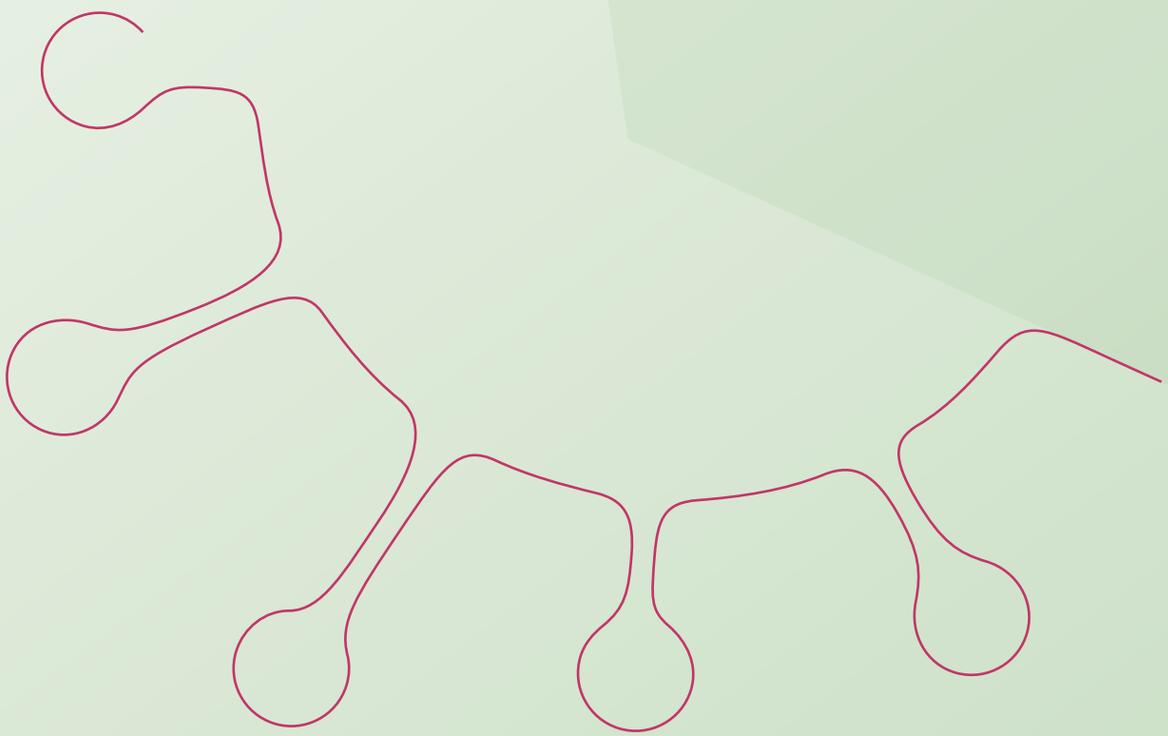


Welcome



Welcome

Dear colleagues,

We are delighted to welcome you to the inaugural **International Workshop on Viral Infections & Inflammation Workshop 2022** in Washington DC, United States.

Inflammatory response and cytokine storm in severely ill COVID-19 patients have put a spotlight on the importance of inflammation in viral infections. Prevalence of long-term COVID is also a concern and potentially related to the suboptimal function of the immune system. Yet, these concerns are not unique to COVID-19. In the case of HIV, despite remarkable improvements in antiretroviral therapy, immune reconstitution remains limited in some patients even a long time after treatment initiation. Exhaustion of primary immune resources due to persistent activation and inflammation drives premature immune aging and impacts life expectancy.

Although HIV and SARS-CoV-2 are fundamentally different infections with distinct long-term consequences, underlying mechanisms that drive those complications might be common. Which plausible mechanisms are at play? Persistent inflammation, mucosal damage, autoimmunity, and immune dysfunction are putative pieces of the puzzle that is yet to be resolved. Our brilliant faculty will share with you the progress in elucidating this remaining unmet need, what have we learned so far, what are the gaps, and what can we do to address those in the future?

We hope you enjoy our beautiful host city of Washington DC and we wish you an enjoyable and educational workshop!

Bonaventura Clotet,
Steven Deeks,
Daniel Kuritzkes,
Jonathan Schapiro

Program Chairs

Bonaventura Clotet, MD, PhD
Universitat Autònoma de Barcelona, Spain

Steven Deeks, MD
University of California, San Francisco, United States

Daniel Kuritzkes, MD
Brigham and Women's Hospital / Harvard Medical School, United States

Jonathan Schapiro, MD
National Hemophilia Center, Sheba Medical Center, Israel

Organizing Committee

Bonaventura Clotet, MD, PhD
Universitat Autònoma de Barcelona, Spain

Steven Deeks, MD
University of California, San Francisco, United States

Steven Grinspoon, MD
Harvard Medical School / Massachusetts General Hospital, United States

Anthony Kelleher, MBBS, PhD, FRACP, FRCPA
The Kirby Institute, Australia

Daniel Kuritzkes, MD
Brigham and Women's Hospital / Harvard Medical School, United States

Michaela Müller-Trutwin, PhD
Institut Pasteur, France

Avindra Nath, MD
National Institutes of Health, United States

Jonathan Schapiro, MD
National Hemophilia Center, Sheba Medical Center, Israel

Irini Sereti, MD
NIAID/NIH, United States

Serena Spudich, MD
Yale University, United States

Abstracts
Accepted abstracts are published in **Reviews in Antiviral Therapy & Infectious Diseases, Volume 2022_7.**

Badge Policy
All registered delegates are provided with a workshop badge. Admission to all events is restricted to registered delegates and official guests wearing their name badges. Please wear your badge at all times to ensure admission to the workshop sessions. 25 USD will be charged for replacing a lost badge.

Certificate of Attendance
Certificates of attendance will be sent by e-mail in the week following the workshop (after completion of the post-workshop survey.)

Code of Conduct
All individuals are required to observe our Code of Conduct. We cannot tolerate any form of discrimination, harassment, disrespect, or the marginalization of those involved in our programs. Please report any incidents to VE and AME via info@amededu.com or to one of our onsite personnel. Any participant who is found to have exhibited any inappropriate conduct or behavior against others may be removed from the program.
View in full: academicmedicaleducation.com/our-commitment-diversity-and-inclusion

Workshop Secretariat
The workshop secretariat is located at the registration desk in the pre-function area of the meeting room.
It is open throughout the workshop to address all your questions concerning logistics.

COVID-19 Measurements
Please always follow the rules and regulations of the host country and the venue.

Face Masks
Attendees are required to wear a face mask in order to enter the workshop venue. The face mask must be worn during the entire length of the workshop. Wearing a face mask will not be mandatory in the areas that are designated for the consumption of food and beverages.

Hand Sanitizer
Multiple hand sanitizer stations will be set up throughout the workshop venue. Please make sure to use them regularly.

Feedback
Your feedback is very valuable to us as it allows us to continue improving future Viral Infections & Inflammation workshops. Please complete the feedback forms that are distributed via email at the end of each workshop day. Your feedback is much appreciated – we will use it to improve the program in 2023.

Posters
Posters are displayed in the meeting room next to the plenary room. Please seek out the posters during refreshment breaks and lunch breaks. All poster presenters are asked to be at their posters at the poster viewing session on day 1.

Presentations and webcasts
The webcast and PDF presentations are available OnAIR for three weeks after the workshop. After this time, they will be made accessible on demand via the conference website. www.AcademicMedicalEducation.com)

Social Program
Thursday September 8 – 6:30 PM | A welcome reception and poster walks are scheduled after the last plenary session.

Presenters
Presenters are requested to submit their presentation as early as possible, latest in the break prior to their session. Our technicians will be available for you at the technician table.

Social Media
We encourage you to post news about the Viral Infections & Inflammation workshop to your social media accounts and tweet about Viral Infections & Inflammation as often as you like during the workshop. You can post your own tweet to your followers using the hashtag #HIVInflammation

WiFi
Network Name: Renaissance_Conference
Password: Virology2022

Virtual

Virtual Platform - Networking
The Meeting Hub allows you to connect and communicate with other attendees. Once you have located an attendee you want to connect with, click the Connect button. Once the other attendee accepts your request, you can choose to interact by starting a live chat or live video call. You can also schedule a meeting at a later time, send messages and take notes. Contact information for all attendees you have connected with will be included when you export contacts.

Virtual Platform - Notes
You will be able to take notes during the virtual workshop. Any notes that you take throughout the event can be exported by selecting the Export icon in the top right of the screen near your Profile image.

Virtual Platform - OnAIR
OnAIR is the virtual meeting platform being used for Viral Infections & Inflammation 2022. A video tutorial on how to use the Workshop Portal can be found here https://www.youtube.com/watch?v=Cp398ZBSJPY

Virtual Platform - Time Zones
Times are in Eastern Daylight Time. If you need to convert the times to your timezone, this website might be of interest to you:
https://www.worldtimebuddy.com/

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Production Coordinator

Thursday, 8 September 2022

Times in Eastern Daylight Time (EDT)

1:00 PM	Lunch
	Opening Session
2:00 PM	**Opening of the Workshop** **Daniel Kuritzkes, MD** Brigham and Women's Hospital / Harvard Medical School, United States
2:10 PM	**Opening Address NIH - DAIDS** **Sarah Read, MD** National Institute of Allergy and Infectious Diseases (NIAID), United States
	Session 1: Acute Inflammation - Part 1 *Chairs: Daniel Kuritzkes & Sarah Read*
2:25 PM	**Post-Infectious Inflammation and Long-Term Health – Across All the Infections** **Daniel Altmann, PhD** Imperial College London, United Kingdom
2:45 PM	**Q & A**
2:50 PM	**Innate Immune Activation in Acute HIV** **Lishomwa Ndhlovu, MD, PhD** Weill Cornell Medicine, United States
3:05 PM	**Q & A**
3:10 PM	**Inflammasome Activation in Acute COVID-19** **Judy Lieberman, MD, PhD** Boston Children's Hospital, Harvard Medical School, United States
3:25 PM	**Q & A**
3:30 PM	**Interferons in Acute Viral Disease - Friend or Foe** **Tomokazu Sumida, MD, PhD** Yale School of Medicine, United States
3:45 PM	**Q & A**
3:50 PM	**Discussion**
4:15 PM	Break

Session 2: Acute Inflammation - Part 2
Chairs: Tomokazu Sumida & Lishomwa Ndhlovu

4:45 PM **Coagulopathy in Acute Viral Infections - COVID-19**
Yogen Kanthi, MD, FAHA, FSVM
National Institutes of Health, United States

5:00 PM **Q & A**

5:05 PM **Characterizing and Targeting Acute Inflammation Following SARS-CoV-2 Infection**
Mirko Paiardini, PhD
Emory University School of Medicine, United States

5:20 PM **Q & A**

5:25 PM **Neurologic Sequelae of Acute Viral Infections**
Avindra Nath, MD
National Institutes of Health, United States

5:40 PM **Q & A**

Abstract - Driven Presentations:

5:45 PM	Impact of Innate Immunity, Endothelial Damage, and Metabolic Biomarkers on COVID-19 Severity and Mortality	Joseph Rocco	#1
5:55 PM	Clinical Rebound of COVID-19 Following Nirmatrelvir/Ritonavir is Not Associated With Delayed Immune Response or Severe Disease	Brian Epling	#2

6:05 PM **Discussion**

6:30 PM Poster Viewing / Welcome Reception

Friday, 9 September 2022

Times in Eastern Daylight Time (EDT)

Session 3: Chronic Inflammation
Chairs: Anthony Kelleher & Judy Lieberman

8:30 AM **Multisystem Inflammatory Syndrome in Children (MIS-C) Post-SARS-CoV-2 Infection**
Carrie L. Lucas, PhD
Yale University, United States

8:45 AM **Q & A**

8:50 AM **Cardiovascular Issues in Acute / Chronic HIV and COVID-19**
Steven Grinspoon, MD
Harvard Medical School / Massachusetts General Hospital, United States

9:05 AM **Q & A**

9:10 AM **Contribution of Adipose Tissue to Chronic Inflammation**
Christine Bourgeois, PharmD, PhD
French National Institute of Health and Medical Research / IMVA-HB Center, France

9:25 AM **Q & A**

Abstract - Driven Presentations:

9:30 AM	Macrophage Arterial Infiltration Relates to Plaque Type and Immune Activation in HIV	Steven Grinspoon	#3
9:40 AM	Modulation of PD-L1 Expression on Myeloid Cells by the IFN/JAK-STAT Axis in Chronically Infected HIV Patients	Léo Plaçais	#4

9:50 AM **Discussion**

10:15 AM Break

Session 4: Post Viral Syndromes
Chair: Javier Martinez Picado

10:45 AM **Long COVID-19 - Role of Microbiome**
Roger Paredes, MD, PhD
IrsiCaixa AIDS Research Institute, Spain

11:00 AM **Q & A**

11:05 AM **Long COVID-19 Immunological**
Anthony Kelleher, MBBS, PhD, FRACP, FRCPA
The Kirby Institute, Australia

11:20 AM **Q & A**

11:25 AM	**Post-Viral Syndrome - Epstein-Barr Virus** **Timothy Henrich, MD** University of California San Francisco, United States		
11:40 AM	**Q & A**		
11:45 AM	Immunological Dysfunction Persists Following Initial Mild-Moderate SARS-CoV-2 Infection	Chan Phetsouphanh	#5
11:55 AM	**Discussion**		
12:20 PM	Lunch		
	Session 5: Persistence *Chair: Steven Grinspoon*		
1:20 PM	**NK Cells** **Michaela Müller-Trutwin, PhD** Institut Pasteur, France		
1:35 PM	**Q & A**		
1:40 PM	**Reservoirs & Persistence - Assays** **Javier Martinez Picado, PhD** AIDS Research Institute (IrsiCaixa), Spain		
1:55 PM	**Q & A**		
2:00 PM	**CMV and Inflammaging in People With HIV** **Sara Gianella Weibel, MD (She/Her)** University of California San Diego, United States		
2:15 PM	**Q & A**		
2:20 PM	**Discussion**		
2:35 PM	**Closure of the Workshop** **Daniel Kuritzkes, MD** Brigham and Women's Hospital / Harvard Medical School, United States		

Invited Speaker

Daniel M. Altmann,

PhD

Imperial College London, United Kingdom

Professor Altmann is Professor of Immunology at Imperial College London, where he heads a lab at the Hammersmith Hospital Campus. Professor Altmann has acted in a range of roles during the pandemic in advice to policymakers, including the House of Commons and House of Lords Science Committees., Layla Moran MP's APPG on Long Covid, advice to the Cabinet Office, to Sir Keir Starmer and the Shadow Cabinet, the Welsh Assembly, the EU, The Scottish Parliament, WHO, NICE and the Department of Health.

He has served for over 20 years as Editor across medical journals including Oxford Open Immunology, Immunology, and Vaccine. He is a trustee at the Medical Research Foundation as well as Long Covid Support and a board member for the African Research Excellence Fund. He previously headed up strategy on infection, immunity and population health at the Wellcome Trust. Professor Altmann's research interests focus on the immunology of infectious diseases including severe bacterial infections, SARS-CoV-2, Zika virus and Chikungunya virus, as well as a long record in autoimmunity research. His SARS-CoV-2 research is published in journals including the Lancet, Nature and Science.

He is currently heading an NIHR-funded research programme to look at mechanisms of pathogenesis and development of new diagnostic tests in a large cohort of individuals with Long Covid.

Potential conflict of interest

AstraZeneca, COVID-19 Vaccine Advisory Board Consultant, and Oxford Immunotec

Invited Speaker

Christine Bourgeois,

PharmD, PhD

French National Institute of Health and Medical Research / IMVA-HB Center, France

Christine Bourgeois is a senior investigator at INSERM (French National Institute of Health and Medical Research) and works in the IMVA-HB Center (Immunology of viral, autoimmune, hematological and bacterial disease), headed by Roger Le Grand in Paris. She is a Pharm. D. PhD and obtained her PhD from Paris-University, France, working on the characterization of CD8 T cell memory in mouse model. She joined the lab of Brigitta Stockinger at NIMR, London where she worked on the homeostatic mechanisms regulating CD4 T functions. In 2007, she joined the INSERM 1012 unit, "Regulation of immune responses, HIV infection and autoimmunity" directed by Pr Marc Tardieu to develop a program on the immunomodulatory mechanisms regulating T cell responses in the context of HIV infection, and joined the team of Pr. Olivier Lambotte ("Control of chronic viral infection") to develop a project on tissue-specific immunity.

The main focus of her work is the characterization of adipose tissue, in its immunological function. We are interested in the anti-infectious properties of adipose tissue immune cells, in healthy and infectious context. In the context of HIV infection, we also aim to understand the impact of both HIV and antiretroviral treatment on adipose tissue immune cells functions.

No potential conflict of interest to report

Faculty

Program Chair

Bonaventura Clotet,

MD, PhD

Universitat Autònoma de Barcelona, Spain

Dr. Clotet received his MD at the Universitat Autònoma de Barcelona in 1976 and his PhD in 1981 for his investigations on surrogate markers for connective tissue diseases.

He is an associated professor of medicine at the Universitat Autònoma de Barcelona, he is the head of infectious diseases department and president of Fundació Lluita contra la Sida" (Fight against AIDS Foundation). Dr. Clotet is also the Director of the retrovirology laboratory at "IrsiCaixa" Foundation and professor of the "Chair of AIDS and related diseases" at the Universitat de VIC (UVic-UCC).

He was Head of the HIV Unit of the Hospital Germans Trias between 1987 and 2015, when he became Head of the Infectious Diseases Department. He is also Director of the Retrovirology Laboratory "IrsiCaixa" Foundation, since 1995, and President of the "Lluita contra la SIDA" Foundation since 1992. Since 2006, he is co-director of the HIVACAT project for the development of the AIDS vaccine in Catalonia, Spain. He is associated professor of Medicine at the Universitat Autònoma de Barcelona (UAB) since 1986, and Professor of the "Chair of AIDS and related diseases" at the University of VIC (UVic-UCC) since October 2013. Dr. Clotet was member of the steering committee of EuroSIDA (multicenter group for the study of AIDS in Europe) between 1994 and 2010. His retrovirology laboratory at "IrsiCaixa Foundation" is the reference lab for HIV resistance in Europe through EuroSIDA.

He has published more than 500 papers in international journals and he is co-director of the AIDS CYBERJOURNAL and has been member of the editorial board of AIDS Journal for 8 years.He has authored numerous chapters in retrovirology, and he has been an invited speaker at numerous international and national conferences.

Dr. Clotet's team is composed by 150 people working at the clinics and at the lab focusing on HIV, immune system abnormalities and related infectious diseases, cancer, papiloma virus, metagenomics, hepatitis and NASH, and aging. Dr. Clotet has created 2 spin-offs, currently active, from IrsiCaixa: AELIX Therapeutics and AlbaJuna Therapeutics.

No potential conflict of interest to report

Program Chair

Steven Deeks,

MD

University of California, San Francisco, United States

Steven G. Deeks, MD, is a Professor of Medicine in Residence at the University of California, San Francisco (

F) and a faculty member in the Division of HIV, Infectious Diseases and Global Medicine at Zuckerberg San Francisco General Hospital. Dr. Deeks has been engaged in HIV research and clinical care since 1993. He is a recognized expert on HIV-associated immune dysfunction and its impact on HIV persistence (the "reservoir") and health during antiretroviral therapy. Dr. Deeks has published over 400 peer-review articles, editorials and invited reviews on these and related topics.

He has been the recipient of several NIH grants, and is one of the principal investigators of DARE (the Delaney AIDS Research Enterprise), which is an NIH-funded international collaboratory aimed at developing therapeutic interventions to cure HIV infection. He is also a member of the Board of Directors for the UCSF-based amfAR Institute for HIV Cure Research. He was elected to the American Society for Clinical Investigation (ASCI), is the Editor for Current Opinion in HIV and AIDSand serves on the advisory board for Science Translational Medicine.

He is a former member of the Office of AIDS Research Advisory Council (ORAC) and of the Department on Health and Human Services Panel on Antiretroviral Guidelines for Adults and Adolescents. In addition to his clinical and translational investigation, Dr. Deeks maintains a primary care clinic for HIV infected adults.

Potential conflict of interest

No infomation available

Invited Speaker

Sara Gianella Weibel,

MD (She/Her)

University of California San Diego, United States

Sara Gianella Weibel, M.D., graduated from the University of Zurich (Switzerland). After her residency in Internal Medicine in Switzerland, she began her fellowship in the Department of Infectious Disease and Hospital Epidemiology of the University Hospital of Zurich in 2007. She moved to UC San Diego in 2009 to work as a postdoctoral fellow and joined the faculty of the Department of Medicine (Division of Infectious Diseases and Global Public Health) in 2013.

Currently she works both at the UC San Diego Antiviral Research Center, and in her laboratory on the UC San Diego campus, where she oversees bench research. She is interested in applying the latest laboratory techniques and rigorous analytical methods to address some of the most pressing problems in infectious diseases. Her research includes investigating HIV persistence in various tissues and anatomical compartments across the human body. She is interested in understanding the transmission dynamics of HIV in the genital tract and its interactions with co-infecting viruses, especially but not limited to Cytomegalovirus. She is committed in contributing to understand sex and gender differences in HIV pathogenesis and persistence. Finally, she is investigating clinical complications related to persistent immune activation.

No potential conflict of interest to report

Organizing Committee

Steven Grinspoon,

MD

Harvard Medical School / Massachusetts General Hospital, United States

Dr. Steven Grinspoon is a Professor of Medicine, Harvard Medical School, Chief of the MGH Metabolism Unit, and Director of the Nutrition Obesity Research Center at Harvard. He has had a long-standing interest in the metabolic and immune complications of HIV disease. He chaired the American Heart Association State of the Science Conference on Cardiovascular Disease in HIV-infected patients.

His work has suggested significant cardiovascular disease in people with HIV (PWH) and highlighted the relative contributions of traditional risk factors, including diabetes and excess visceral fat accumulation, and of nontraditional risk factors, including inflammation and immune activation, using novel PET and CT techniques linking arterial inflammation to high risk vulnerable plaque. In this regard, he is a co-leader of the 7700 participant, global NIH-funded REPRIEVE study to prevent cardiovascular disease in HIV.

In addition, he has shown efficacy of strategies to improve ectopic adipose tissue, leading the development of an FDA approved strategy for visceral fat reduction. For his work, Dr. Grinspoon was awarded the 2016 Aurbach Laureate award in translational research from the Endocrine Society. Dr. Grinspoon is a member of the American Society of Clinical Investigation and the Association of American Physicians, honoring his achievements.

Potential conflict of interest

Kowa, ViiV, Gilead, and Theratechnologies

Invited Speaker

Timothy Henrich,

MD

University of California San Francisco, United States

Dr. Henrich's laboratory/research group specializes in immunmodulatory, cytoreductive chemotherapeutic, and stem cell transplantation approaches to HIV-1 cure.

They are also involved in designing and implementing novel nano/microtechnologies and PET-based imaging approaches to characterize viral reservoirs.

Most recently, Dr. Henrich studied the long-term inflammatory and immunological sequalae of SARS-CoV-2 infection and human herpes virus reactivation during acute viral infections.

Potential conflict of interest

NIH/NIAID, Merck and Co., Roche, and Regeneron

Invited Speaker

Yogen Kanthi,

MD, FAHA, FSVM

National Institutes of Health, United States

Dr. Yogen Kanthi is a Lasker Investigator at the National Institutes of Health, and a practicing cardiologist and vascular medicine specialist. He leads a clinical and research program focused on understanding the role of inflammation in thrombogenesis. Dr. Kanthi's research team were the first to describe innate immune hyperactivation and dysfunctional autoantibodies in COVID-19, which have led to numerous clinical trials. The long-term goal of his research program is to develop new treatments for highly morbid inflammatory and thrombotic diseases.

Potential conflict of interest

University of Michigan

Organizing Committee

Anthony Kelleher,

MBBS, PhD, FRACP, FRCPA

The Kirby Institute, Australia

Professor Anthony (Tony) Kelleher is a clinician scientist. He graduated from Medicine at UNSW in 1986. He trained in internal medicine and pathology at St Vincent's Hospital, Sydney at the height of the HIV epidemic, qualifying as a Clinical Immunologist and Immunopathologist in 1995.

Professor Kelleher completed his PhD in 1997, describing the modulation of the HIV infected immune system by a range of interventions including therapeutic vaccines and IL-2. He made the first observations describing the reconstitution of antigen specific CD4+ T cell responses in patients receiving potent anti-retroviral therapy in the context of an early phase trial of the HIV protease inhibitor, Ritonavir.

Professor Kelleher was appointed Director of the Kirby Institute at UNSW Sydney in early 2019. He is also Head of the Kirby Institute's Immunovirology and Pathogenesis Program, and Principal of the Infection Immunology and Inflammation Theme at UNSW Medicine. As a clinical academic at St Vincent's Hospital Sydney, Professor Kelleher is responsible for clinical care of patients with HIV infection and autoimmune diseases as well as oversight of the NSW State HIV Reference laboratory.

Potential conflict of interest

ViiV and Merck

Program Chair

Daniel Kuritzkes,

MD

Brigham and Women's Hospital / Harvard Medical School, United States

Daniel Kuritzkes is the Harriet Ryan Albee Professor of Medicine at Harvard Medical School and Chief of the Division of Infectious Diseases at Brigham and Women's Hospital in Boston, Massachusetts. He received his B.S. and M.S. degrees from Yale University and his M.D. from Harvard Medical School.

Dr. Kuritzkes has published extensively on antiretroviral therapy and drug resistance in HIV-1 infection. He has chaired several multicenter studies of HIV therapy and previously chaired the AIDS Clinical Trials Group. He served as a member of the NIH Office of AIDS Research Advisory Council and as a member of the U.S. Department of Health and Human Services panel on guidelines for antiretroviral therapy.

He has been a member of several editorial boards and serves an Associate Editor of the Journal of Infectious Diseases. His research interests focus on HIV therapeutics, antiretroviral drug resistance, and HIV eradication.

Potential conflict of interest

Atea, Decoy, Gilead, GlaxoSmithKline, Janssen, Merck, ViiV, ViroStatics, and Novartis

Faculty

Invited Speaker

Judy Lieberman,

MD, PhD

Boston Children's Hospital, Harvard Medical School, United States

Endowed Chair in Cellular and Molecular Medicine, Boston Children's Hospital and Professor of Pediatrics, Harvard Medical School

The Lieberman laboratory studies cytotoxic T lymphocytes and NK and their role in immune protection from infection and cancer, focusing on the molecular pathways used to kill both mammalian cells and microbes (bacteria and parasites). She was the first to describe CD8 T cell exhaustion in humans, which is the basis for current checkpoint blockade therapies for treating cancer. They also identified the mechanism behind inflammatory death (pyroptosis) triggered by innate immune recognition of pathogens and danger signals and the role of pyroptosis in infection and cancer. Recent work has identified important roles for pyroptosis in SARS-CoV-2, Yersinia, and Group A streptococcal infection.

Her laboratory has also been in the forefront of developing RNAi-based therapeutics and using RNAi for genome-wide screening. They were the first to show that siRNAs could be used to treat disease in vivo and to develop cell-targeted RNAs that knockdown gene expression in vivo in immune cells and cancer.

Dr. Lieberman is a member of the American Academy of Arts and Sciences, the National Academy of Sciences and the National Academy of Medicine.

Potential conflict of interest

Ventus Therapeutics

Invited Speaker

Carrie L. Lucas,

PhD

Yale University, United States

Dr. Carrie L. Lucas received her PhD from Harvard Medical School and her postdoctoral training from the National Institutes of Health, NIAID. The Lucas laboratory is devoted to discovering new and translationally relevant principles of immunology by defining and studying severe pediatric immune disorders. Combining human genomics, in vitro studies using primary patient cells, and in vivo mouse modeling approaches, her team seeks to gain incisive basic and translational insights starting with patients. The lab's focus on primary immunodeficiencies has largely centered around phosphoinositide 3-kinase (PI3K) signaling and disease mechanisms and treatments in patients with mutations in PI3K subunits.

More recently, the lab has added an emphasis on studying inflammatory diseases, including 'multisystem inflammatory syndrome in children' (MIS-C) post-SARS-CoV-2 infection and a new monogenic autoinflammatory disease the Lucas lab named 'Deficiency in ELF4, X-linked' (DEX). Each of our research projects starts with an initial focus on dissecting pediatric immune diseases and aims to leverage that knowledge for new therapies, including precision medicine approaches in monogenic diseases.

The rare diseases we study uniquely enable us to gain in-depth mechanistic insights into human immunology, thereby providing translational knowledge to improve understanding and treatment of a broader set of common diseases with immune involvement.

No potential conflict of interest to report

Invited Speaker

Javier Martinez - Picado,

PhD

AIDS Research Institute (IrsiC-aixa), Spain

Javier Martinez-Picado is an ICREA Research Professor at the AIDS Research Institute IrsiCaixa in Barcelona, where he leads the Retrovirology and Clinical Studies group. He is also an associate professor at the University of Vic (UVic-UCC). He received his PhD in Microbiology from the University of Barcelona, where he also lectured as an associate professor. He later engaged in HIV/AIDS research at the Harvard Medical School (Boston).

His current scientific interests focus characterizing the immuno-virological mechanisms of viral pathogenesis in human diseases, including HIV-1, Ebola virus, Arenaviruses, and more recently SARS-CoV-2. His program has a translational character with the goal of investigating potential new viral therapeutic strategies, especially in the HIV/AIDS field, through both basic and applied research.

He serves on several governmental, academic and industry advisory boards. He has published more than 200 articles on HIV treatment strategies and HIV pathogenesis in international journals.

Potential conflict of interest

AbiVax, AstraZeneca, Gilead Sciences, Grifols, Janssen, Merck Sharp & Dohme, and ViiV Healthcare.

Organizing Committee

Michaela Müller-Trutwin,

PhD

Institut Pasteur, France

Michaela Müller-Trutwin is Professor at Institut Pasteur and head of the “HIV, Inflammation and Persistence” Unit. She studied Biology at the University in Bonn and Frankfurt. She obtained her PhD from Paris-University, France (Barré-Sinoussi lab). She worked at Research institutes in West- and Central-Africa.

She served as chair of the “Nonhuman primate models working group” and within the “innate immunity coordinated action” at the ANRS. Among other duties, she serves as the chair of the coordinated action on HIV basic research at the ANRS-MIE, the Vice-president of the Scientific Council at Institut Pasteur and member of the Steering Committee at IDMIT (French NHP research center). She has co-organized multiple meetings (Keystone, HIV dynamics, EACS HIV Cure symposia etc). The lab is focused on deciphering the early host immune responses to identify factors involved in viral reservoir control and tissue damage protection with the aim to translate the findings into clinical research. Her team made key contributions on the role of inflammation in HIV pathogenesis.

More recently, they uncovered an important role of NK cells in the control of SIV replication in tissues. Her work has been honored by awards, such as by the French Medical Research Foundation.

No potential conflict of interest to report

Faculty

Organizing Committee

Avindra Nath,

MD

National Institutes of Health, United States

Dr. Nath is the Clinical Director of the National Institute of Neurological Disorders and Stroke (NINDS) at NIH, where he is also Chief of the Section of Infections of the Nervous System, Director of the Translational Center for Neurological Sciences.

He is a physician–scientist who specializes in neuro-immunology and neurovirology. His research is focused on the clinical manifestations, pathophysiology and treatment of emerging neurological infections with a focus on HIV infection. In recent years, he has studied the neurological complications of endogenous retroviruses, Ebola, Zika virus and SARS-CoV-2 and conducts research on patients with undiagnosed neuroinflammatory disorders. He has served on advisory committees to the NIH, CDC, FDA and WHO. The International Society of NeuroVirology gave him the Pioneer in NeuroVirology Award for his contributions to HIV neuropathogenesis and elected him as the President of the Society. He received the Wybran award from the Society of Neuroimmune Pharmacology for contributions to Neurovirology. He also received the NIH Director's award for his work on SARS-CoV-2 and the HHS Secretary's award for his work on Ebola infection.

No potential conflict of interest to report

Invited Speaker

Lishomwa Ndhlovu,

MD, PhD

Weill Cornell Medicine, United States

Lishomwa (Lish) Ndhlovu MD, PhD is a Professor of Immunology in Medicine in the Division of Infectious Diseases at Weill Cornell Medicine. The thrust of his research program is confronting the challenges of HIV and aging and is developing specific strategies to prevent, slow or eliminate complications associated with HIV. His team combines immunology, virology and epigenetic methods exploring molecular mechanism of HIV pathogenesis and persistence through pre-clinical and clinical investigations and has expanded towards finding an HIV cure.

He has also become increasingly involved in bringing the same urgency and focus to the COVID-19 pandemic and exploits immuno-epigenetic approaches to resolve molecular mechanisms regulating SARS-CoV-2 infection across tissues and cell types in people with and without HIV. His lab is largely supported by individual and consortia grants from the NIH.

He is a member of the International Neuro-HIV Cure Consortium and Co-leader of the $26.5 million NIH - funded Martin Delaney Collaboratory for HIV Cure "HOPE" and NIDA funded U01-SCORCH program documenting single cell opioid responses in the brain in the setting of HIV. Heis an elected Fellow of the American Academy of Microbiology and serves as Co-Editor in Chief of the journal, AIDS Research and Human Retroviruses.

Potential conflict of interest

Abbvie and ViiV

Invited Speaker

Mirko Paiardini,
PhD

Emory University School of Medicine,
United States

Mirko Paiardini, PhD., is a Professor of Pathology and Laboratory Medicine at Emory University's School of Medicine and a Scientist in the Division of Microbiology and Immunology at the Emory National Primate Research Center. He is also serving as co-Director of Emory's Center for AIDS Research "Next Generation Therapeutics" scientific working group. Utilizing simian immunodeficiency virus (SIV)-infected nonhuman primates to model viral pathology seen in humans living with HIV, Dr. Paiardini's research program is focused on characterizing mechanisms of inflammation and viral persistence amid long-term antiretroviral therapy (ART) and harnessing immune-based strategies to facilitate viral remission in the absence of ART.

Dr. Paiardini has authored more than 130 research peer-reviewed publications with >10,000 citations, and has been invited for numerous lectureships at academic institutions and immunology conferences. He currently serves as principal investigator of the Martin Delaney Collaboratory for HIV Cure Research "ERASE-HIV" and is the recipient of awards from the Pitts Foundation and FastGrants for COVID-19 research.

Dr. Paiardini currently serves on the Editorial Board for the Journal of Virology and as Associate Editor for Pathogens and Immunity. Finally, he serves on numerous study sessions for the NIH, National Science Foundation, and the Canadian Institutes of Health Research.

No potential conflict of interest to report

Invited Speaker

Roger Paredes,
MD, PhD

IrsiCaixa AIDS Research Institute, Spain

Roger Paredes, MD, PhD, is Head of the Infectious Diseases Department, Hospital Germans Trias i Pujol and Principal Investigator of the Microbial Genomics Group at the IrsiCaixa AIDS Research Institute, Badalona, Catalonia, Spain. He obtained an MD, PhD degree in Medicine and Surgery from the Autonomous University of Barcelona (UAB) and specialised in HIV research at the Brigham & Women's Hospital, Harvard Medical School, through a La Caixa grant for postgraduate studies.

His team at IrsiCaixa has demonstrated the clinical utility of HIV-1 deep sequencing in both high- and low-income countries, and is now leading pioneering research into the role of the gut microbiome in the pathogenesis of HIV infection and chronic inflammation. During the COVID-19 pandemic, Dr Paredes has been the Spanish National Coordinator of seminal NIH/NIAID-funded randomized clinical trials, including ACTT-1 and 2 and the ACTIV-3/TICO platform, which have defined the current standard of care for this disease in hospitalized patients as well as in outpatients.

Dr. Paredes is member of the COVID-19 treatment guidelines of the Spanish ID Society and the Catalan Institute of Health. He is also member of the WHO Global Clinical Platform for COVID-19 Clinical Advisory Group and serves in the WHO's HIV Drug Resistance Strategy Steering Committee, the HIV treatment guidelines group and the European Laboratory Initiative.

Potential conflict of interest

No infomation available

Faculty

Invited Speaker

Sarah Read,
MD

National Institute of Allergy and Infectious Diseases (NIAID), United States

Sarah Read, MD, serves as Deputy Director of the Division of AIDS (DAIDS) at the National Institute of Allergy and Infectious Diseases (NIAID). The division supports a global HIV/AIDS research portfolio of more than $1 billion in the areas of 1) fundamental basic laboratory research, 2) discovery and development of therapies for HIV infection, related co-infections, and non-infectious co-morbidities, and the complications associated with treated HIV disease through basic research and clinical trials, and 3) discovery and development of vaccines and other prevention strategies through basic research and clinical trials.

Previously, Dr. Read served as Director of the Therapeutics Research Program in DAIDS. Prior to joining DAIDS, she was an Associate Clinical Investigator in the Laboratory of Immunoregulation at NIAID where her research focused on immune activation and inflammation in treated HIV infection as well as on immune based therapies for HIV.

No potential conflict of interest to report

Program Chair

Jonathan Schapiro,
MD

National Hemophilia Center, Sheba Medical Center, Israel

Jonathan M Schapiro, MD has devoted his career to HIV clinical care, research and education since completing his Fellowship in Infectious Diseases and Geographic Medicine at the Stanford University School of Medicine Center For AIDS Research, Stanford CA. Dr. Schapiro Graduated from the Ben Gurion University School of Medicine and completed his Medicine Residency at the Rabin Medical Center in Israel.

Dr. Schapiro's research has focused on the causes of antiretroviral drug failure, interventions to optimize clinical care, and new drug development. His interests have include resistance and cross-resistance between drugs, associations between resistance and pharmacology, development of new antiretroviral agents with improved resistance and pharmacological profiles, the clinical utility of resistance and drug level testing, and integrating resistance assays and other diagnostics into clinical care. He has been involved in the development of advanced interpretation systems for these assays, and has worked to highlight the importance of interactions between drug exposure and resistance. Dr. Schapiro currently runs the HIV/AIDS clinic at the National Hemophilia Center in Tel Aviv, Israel.

Potential conflict of interest

Abbvie, Merck, Gilead Sciences, GlaxoSmithKline, Tibotec-Janssen, Teva, Virology Education, ViiV Healthcare, and WHO

Organizing Committee

Irini Sereti,

MD

NIAID/NIH,
United States

Dr Sereti is the Chief of the HIV Pathogenesis Section in the Laboratory of Immunoregulation at NIAID. After her Internal Medicine training and Chief residency at Northwestern University in Chicago, she completed an infectious disease fellowship at NIAID/NIH and joined the Laboratory of Immunoregulation, initially as a staff clinician, and starting in 2009 as a tenure track investigator. She received tenure in 2015.

Her group studies the acute (IRIS) and long-term inflammatory complications of treated HIV and the etiology, prognosis and management of idiopathic CD4 lymphopenia, a rare disorder of low CD4 counts in the absence of HIV. Her previous work on inflammation and lymphopenia has aspired new projects on COVID-19 to address both the pathogenic mechanisms of inflammation and lymphopenia and to study immune interventions. Dr Sereti is a physician-scientist with a strong commitment to diversity, excellence in clinical care and mentorship.

No potential conflict of interest to report

Organizing Committee

Serena Spudich,

MD

Yale University,
United States

Serena is Gilbert H. Glaser Professor of Neurology and Chief, Division of Neurological Infections and Global Neurology at Yale University. Her clinical and translational research explores effects of HIV and other viral infections in the nervous system, focusing on effects of acute infection, antiviral and immune treatments, and cure strategies on viral pathogenesis and persistence in the central nervous system (CNS).

She collaborates with colleagues of multiple disciplines in studies in the United States and in international settings, exploring questions of inflammation, injury, and viral reservoirs within the central nervous system. She has been active in the AIDS Clinical Trials Group (ACTG) Neurology and HIV Reservoirs and Eradication committees, co-leads the International NeuroHIV Cure Consortium, serves on the US DHHS Antiretroviral Treatment Guidelines Committee, CROI Program Committee, and leads multidisciplinary projects addressing the pathobiology of HIV and SARS-CoV-2 in the CNS.

She also is a neurology physician who cares for patients with viral infections and neurological disorders in clinics at Yale.

No potential conflict of interest to report

Invited Speaker

Tomokazu Sumida,

MD, PhD

Yale School of Medicine,
United States

Dr. Tomokazu Sumida received his MD, PhD and practiced as a cardiologist in Japan. Through studying the interface between the immune system and cardiovascular disease, the research focus shifted toward basic and translational immunology. The Sumida lab's main focus is on understanding molecular mechanisms that drive T cell dysfunction, especially regulatory T cells, in human diseases by using cutting-edge technologies (i.e. Single-cell multi-omics, ATAC-seq, CRISPR gene editing/regulation).

The lab also focusses on co-inhibitory receptor signaling as a central regulatory mechanism governing immune cell activation, primarily on T cells. Recent COVID-19 pandemic provides the opportunity to better understand the molecular mechanisms by which COVID-19 patients develop severe clinical manifestation, where type 1 IFN response plays fundamental role in modulating co-inhibitory receptor expression and T cell functions. Fine-tuned immune regulation is somehow rewired in disease settings due to dysfunctional properties of diverse types of immune cells.

Understanding the cellular and molecular programs that control fine-tuned regulation of inflammation in human immune cells is a key to combating autoinflammatory disorders.

No potential conflict of interest to report

Abstracts

ORAL #1 Impact of Innate Immunity, ndothelial Damage, and Metabolic Biomarkers on COVID-19 Severity and Mortality

Rocco J[1], Laghetti P[2], Di Stefano M[3], Sereti I[1], Ortega-Villa A[1], Wang J[7], Rupert A[4], Chironna M[5], Ye L[1], Liu X[1], Anderson M[1], Burbelo P[6], Fiore J[3], Saracino A[2], Lisco A[1]

[1]National Institute Of Allergy And Infectious Diseases, Bethesda, United States, [2]University of Bari, Bari, Italy, [3]University of Foggia, Foggia, Italy, [4]Leidos Biomedical Research, Frederick, United States, [5]Azienda Ospedaliero-Universitaria Consorziale Policlinico di Bari, Bari, Italy, [6]National Institute of Dental and Craniofacial Research, Bethesda, United States, [7]Frederick National Laboratory for Cancer Research, Frederick, United States

Background: COVID-19 is a heterogeneous clinical disease ranging from asymptomatic infection to life-threatening acute respiratory distress syndrome which continues to cause significant morbidity and mortality worldwide. It remains imperative to continually refine the understanding of SARS-CoV-2 pathogenesis and its clinical implications.

Methods: De-identified clinical blood samples from 128-patients with molecularly confirmed SARS-CoV-2 infection were collected near the time of hospital admission and prior to any medical treatment at two Southern Italian medical centers between February and September 2020. Disease severity was categorized as mild-moderate or severe-critical based on the greatest disease severity experienced throughout admission. The impact of clinical characteristics and 35 soluble biomarkers relating to innate immunity, myeloid cell activation, endothelial damage, and metabolism on COVID-19 severity and in-hospital mortality was evaluated by logistic regression modeling.

Results: Data was collected from 128 consecutive patients with COVID-19 (60-patients with mild-moderate, and 68 with severe-critical disease). The median age was 59-years (IQR: 50-79) and 66-patients (51.6%) were women. Ten total deaths were recorded in the cohort. Univariate logistic regression controlling for time from symptom onset to sample collection identified increased age with odds ratio (OR) 1.06 per year (95% CI: 1.04-1.10) and D-dimer (OR: 4.48, 95% CI:1.77-12.76) was associated with severe-critical disease, whereas a higher absolute lymphocyte count was protective (OR: 0.11, 95% CI: 0.02-0.54). Abnormal levels of innate immunity biomarkers (IL-6, pentraxin-3, C1q), myeloid cell activation (soluble CD14, IL-27), coagulopathy, and endothelial damage (thrombomodulin, adhesion molecules) were associated with severe COVID-19 and in-hospital mortality by univariate regression. In contrast, higher levels of metabolic biomarkers, irisin (OR: 0.03, 95% CI: 0.0-0.68) and leptin (OR: 0.23, 95% CI: 0.06-0.76), associated with a protective effect against severe disease and mortality, respectively. Stepwise multivariate logistic regression identified PTX3 (OR: 10.5, 95% CI: 1.84-79.1), IL-6 (OR: 7.37, 95% CI: 1.82-40.3), and C1q (OR: 48.3, 95% CI: 2.29-1663) as the most important biomarkers associated with severe-critical COVID-19. Consistent with these findings, a decision tree model identified PTX3 >8.68 ng/ml as the most robust predictor of severe disease with a second node at age >62-years old.

Conclusions: We propose a cohesive model for COVID-19 immunopathogenesis driven by exuberant inflammation and endothelial damage in metabolically-predisposed individuals. These markers and their link with immunometabolic characteristics of patients may have clinical utility in risk stratifying hospitalized patients early in their disease course. They also implicate new mechanistic pathways requiring further evaluation to advance our understanding of the pathogenesis of severe COVID-19.

ORAL #2 Clinical Rebound of COVID-19 Following Nirmatrelvir/Ritonavir Is Not Associated With Delayed Immune Response or Severe Disease

Epling B[1], Rocco J[1], Boswell K[2], Laidlaw E[1], Galindo F[1], Kellogg A[3], Das S[4], Roder A[5], Ghedin E[5], Kreitman A[5], Dewar R[6], Kelly S[7], Kalish H7, Rehman T[6], Highbarger J[6], Rupert A[9], Kocher G[8], Holbrook M[8], Lisco A[1], Manion M[1], Koup R[2], Sereti I[1]

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Background: Nirmatrelvir/ritonavir, the first SARS-CoV-2 protease inhibitor, reduces the risk of hospitalization and death by COVID-19, but has been associated with symptomatic rebound after therapy completion.

Methods: Six individuals who developed relapse of COVID-19 symptoms after treatment with nirmatrelvir/ritonavir were evaluated. One individual with rebound symptoms without prior antiviral therapy was also included in the study. Five participants with Omicron-variant infection without recurrent symptoms were used as controls. Soluble biomarkers and serum SARS-CoV-2 nucleocapsid protein were measured. Nasal swabs positive for SARS-CoV-2 underwent viral isolation and targeted viral sequencing. SARS-CoV-2 anti-spike, anti-receptor binding domain, and anti-nucleocapsid antibodies were measured. Surrogate viral neutralization tests against wild-type and Omicron spike protein, as well as T-cell stimulation assays, were performed.

Results: High levels of SARS-CoV-2 anti-spike IgG antibodies were found in all participants, who were all fully vaccinated. Anti-nucleocapsid IgG and Omicron-specific neutralizing antibodies increased in patients with rebound symptoms. Robust SARS-CoV-2 specific T-cell responses were observed, which were higher in rebound compared to early acute COVID-19 patients. Inflammatory markers mostly decreased during rebound. Both patients sampled longitudinally demonstrated an increase in activated-cytokine producing CD4+ T-cells against viral proteins. No characteristic resistance mutations were identified, and SARS-CoV-2 was isolated by culture in one rebound patient.

Conclusions: Nirmatrelvir/ritonavir treatment does not impair the development of adaptive immune responses to SARS-CoV-2. The risk of disease progression during clinical rebound appears small. The presence of infectious virus supports the need for isolation and the need to assess longer treatment courses in immunocompromised people.

ORAL#3 Macrophage Arterial Infiltration Relates to Plaque Type and Immune Activation in HIV

Toribio M[1], Wilks M[1], Hedgire S[1], Lu M[1], Wang M[1], Cetlin M[1], Alhallak I[1], Wallis Z[2], White K[2], Stanley T, El-Fakhri G[1], Autissier P[2], Zanni M[1], Williams K[2], **Grinspoon S[1]**

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Background: Persistent immune activation and downstream macrophage-specific arterial infiltration are thought to contribute to heightened atherosclerotic cardiovascular disease (ASCVD) risk among people with HIV (PWH) on ART. We applied a novel macrophage-specific imaging modality to investigate macrophage-specific infiltration among participants with vs without HIV in relation to atherosclerotic plaque and immune activation.

Material and Methods: Twenty PWH on ART and 10 participants without HIV underwent systemic administration of the CD206 macrophage-specific radiotracer, 99mTc-tilmanocept, followed by SPECT/CT imaging to assess arterial inflammation. Participants were ≥18 yrs and without a history of symptomatic ASCVD. The volume of aortic tilmanocept uptake that was 3-6x background muscle activity (signal to background ratio, SBR) was measured. Aortic plaque volumes [total, non-calcified (Hounsfield units (HU) <130), and calcified plaque (HU≥130)] were quantified using cardiac CT. Systemic levels of markers of immune activation and immune cell subpopulations were quantified using commercial ELISA kits and flow cytometry, respectively. For our primary endpoint analysis, a repeated measures ANOVA including all observations with the percent aortic volume above a given threshold of 99mTc-tilmanocept uptake, controlling for sex, was used.

Results: Participants with vs without HIV were similar in age (55.1 vs 58.4 yrs, P=0.12) and 10-yr ASCVD risk (7.3 vs. 8.1, P=0.70). Total, non-calcified, and calcified aortic plaque volume did not differ significantly between groups. Systemic markers of immune activation (caspase-1: P=0.01, MCP-1: P=0.02, and CXCL10: P=0.0004) and non-classical/homing monocytes (CD14-CD16+: P=0.02) were higher among PWH. Aortic 99mTc-tilmanocept uptake, measured as volume at specific thresholds above background, was significantly higher among PWH versus participants without HIV with 10-year ASCVD risk (P=0.02). Among PWH, but not among participants without HIV, non-calcified aortic plaque volume related directly to aortic 99mTc-tilmanocept uptake at different uptake thresholds. A significant interaction (P=0.001) was seen between HIV status and non-calcified plaque volume, but not calcified plaque (P=0.83). Levels of caspase-1 (P=0.004), CD14- CD16+ (non-classical/patrolling/homing) monocytes (P=0.0004) and CD8+ T-cells (P=0.005) related positively and CD4+/CD8+T-cell ratio (P=0.02) inversely to aortic 99mTc-tilmanocept uptake volume.

Conclusions:Macrophage-specific arterial inflammation was higher among PWH and related to non-calcified aortic plaque volume only among PWH. Key immune pathways relating to macrophage-specific arterial inflammation may contribute to heightened ASCVD risk among PWH and are thus of relevance to identifying novel immunomodulatory therapies for CVD reduction.

ORAL #4 Modulation of PD-L1 Expression on Myeloid Cells by the IFN/JAK-STAT Axis in Chronically Infected HIV Patients

Plaçais L[1], Joly C, D'Urbano V, Paolini A, Bitu M, Mouanga C, Desjardins D, Jacquelin B, Müller-Trutwin M, Bourgeois C, Lambotte O, Noël N

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Introduction: People living with HIV (PLWHIV) and treated with antiretroviral therapy (ART) are exposed to chronic inflammation and immune dysfunction, associated with immune checkpoint inhibitors expression on immune cells. We postulate that the interferon/JAK-STAT pathway regulates PD-L1 on myeloid cells from PLWHIV.

Methods: Sixteen chronically infected and virologically suppressed HIV-1 infected patients (ART-HIV) were compared to 15 donors for the expression of PD-L1 through flow cytometry and RT-qPCR. Peripheral mononuclear blood cells (PBMCs) isolated from whole blood were cultured for 24 hours with or without addition of type 1 interferon (IFN-- 2a, 500UI/L), type 2 interferon (IFN-- , 10ng/mL), and a JAK1/2 inhibitor, Baricitinib (250nM or 500nM).

Results: Despite long term viral control, ART-HIV patients PBMCs had a higher ex-vivo expression of PD-L1 and CXCL-10, and a greater proportion of PDL1+ non-classical monocytes and conventional dendritic cells than donors. Mx1 ex-vivo expression correlated with PD-L1 expression on monocytes, and IFN-- 2a stimulation led to a significant increase in PD-L1, Mx1 and CXCL-10 expression, as well as of PD-L1+ myeloid cells subtypes, confirming an association between type 1 interferon and PD-L1 expression. An early pre-treatment with Baricitinib significantly reduced both PD-L1 expression and the proportion of PD-L1+ and LILRB2+ myeloid cells after culture and prevented the interferon-mediated PD-L1 and CXCL-10 induction. ART-HIV patients' monocytes were more sensitive for IFN-- induced PD-L1 expression and required higher doses of Baricitinib to prevent IFN-mediated PD-L1 expression.

Conclusion: Our study shows that PLWHIV harbor signs of myeloid cell exhaustion, associated with increased type 1 interferon-signaling, which can be reversed by JAK1/2 inhibitors, and pave the way for future therapeutics approaches.

ORAL #5 Immunological Dysfunction Persists Following Initial Mild-Moderate SARS-CoV-2 Infection

Phetsouphanh C[1], Darley D[2], Klemm V[1], Wilson D[3], Munier C[1], Dore G[1], Kelleher A[1], Matthews G[1]

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A proportion of patients surviving acute COVID-19 infection develop post-COVID syndrome (long COVID) encompassing physical and neuropsychiatric symptoms lasting longer than 12 weeks. Here we studied a prospective cohort of individuals with long COVID compared to age/gender matched subjects without long COVID (from the ADAPT study), healthy donors and individuals infected with other non-SARS-CoV-2 human coronaviruses (the ADAPT-C study). We found highly activated innate immune cells and an absence of subsets of un-activated naïve T and B cells in peripheral blood of long COVID subjects, that did not reconstitute over time. These activated immune cells may contribute to the elevated levels of type I (IFN-beta) and III interferon (IFN-lambda1) that remained persistently high in long COVID subjects at 8 months post-infection. A log-linear classification model was used to define an optimal set of analytes, of the 29 measured, that had the strongest association with long COVID. Combinations of IFN-beta PTX3, IFN-gamma, IFN-lambda2/3 and IL-6 associated with long COVID with an accuracy ranging from 78.5% to 81.6%. In addition, T cell and neutralising antibody responses were higher in patients with long COVID compared to controls at 8-months post-infection, which suggests that there may be persistent viral antigen. This work defines immunological parameters associated with long COVID and suggests future opportunities for prevention and treatment.

POSTER #6 Effect of Polymerized Type I Collagen in Hyperinflammation of Adult Outpatients With Symptomatic COVID-19: A Double Blind, Randomised, Placebo-Controlled Clinical Trial

Del Carpio-Orantes L[1], Furuzawa-Carballeda J[2], Méndez-Flores S[2], Priego-Ranero A[2], Azamar-Llamas D[2], Olvera-Prado H[2], Rivas-Redondo K[2], Ochoa-Hein E[2], Pérez-Ortíz A[2], Rojas-Castañeda E[2], Urbina-Terán S[2], Septién-Stute L[2], Hernández-Gilsoul T[2], Aguilar-Morgan A[2], Fernández-Camargo D[2], Olivares-Martínez E[2], Hernández-Ramírez D[2], Torres-Villalobos G[2], Rendón-Macías M[2]

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Background: Currently, therapeutic options for outpatients with COVID-19 are limited, in Mexico Polymerized Collagen type I (PCTI) has been tested as a useful option.

Methods: Double-blind, randomised, placebo-controlled clinical trial of PTIC vs placebo. To evaluate the safety, efficacy and effect of the intramuscular administration of polymerized type I collagen (PTIC) on hyperinflammation, oxygen saturation and symptom improvement in adult outpatients with symptomatic COVID-19. Eighty-nine adult participants with a confirmed COVID-19 diagnosis and symptom onset within the 7 days preceding recruitment were included from August 31, 2020 to November 7, 2020 and followed for 12 weeks. Final date of follow-up was February 4, 2021. Patients were randomly assigned to receive either 1.5 ml of PTIC intramuscularly every 12 h for 3 days and then every 24 h for 4 days (n=45), or matching placebo (n=44).

Results: Of 89 patients who were randomised, 87 (97.8%) were included in an intention-to-treat analysis; 37 (41.6%) were male and mean age was 48.5±14.0 years. The IP-10 levels decreased 75% in the PTIC group and 40% in the placebo group vs baseline. The comparison between treatment vs placebo was also statistically significant (P=0.0047). The IL-8 (44%, P=0.045), M-CSF (25%, P=0.041) and IL-1Ra (36%, P=0.05) levels were also decreased in the PTIC group vs baseline. Mean oxygen saturation ≥92% was achieved by 40/44 (90%), 41/42 (98%) and 40/40 (100%) of participants that received PTIC at 8, 15 and 97 days of follow-up vs 29/43 (67%), 31/39 (80%) and 33/37 (89%) of patients treated with placebo (P=0.001). The unadjusted accelerated failure time model showed that patients treated with PTIC achieved the primary outcome 2.70-fold faster (P< 0.0001) than placebo. In terms of risk, the group of patients treated with PTIC had a 63% lower risk of having a mean oxygen saturation < 92% vs placebo (P< 0.0001). Symptom duration in patients treated with PTIC was reduced by 6.1±3.2 days vs placebo. No differences in adverse effects were observed between the groups at 8, 15 and 97 days of follow-up.

Conclusion:Treatment with PTIC down-regulated IP-10, IL-8, M-CSF and IL-Ra levels (direct anti-inflammatory effect), which could explain the PTIC effect on the higher proportion of patients with mean SaO2 ≥92% and a shorter duration of symptoms as compared with placebo.

POSTER #7 Comparative Analysis Between Polymerized Type I Collagen and Baricitinib as a Potential Treatment for Severe Inflammatory and Hypoxemic Pneumonia Due to COVID-19

Del Carpio-Orantes L[1], García-Méndez S, Sánchez-Díaz J[1]

[1]*Instituto Mexicano Del Seguro Social, Veracruz , Mexico*

Background: Baricitinib is a treatment authorized by the FDA for the treatment of moderate to severe COVID-19, despite this there are few approved drugs; polymerized type I collagen (PTIC) is a drug that has been used in Mexico with great potential for treating moderate to severe cases of COVID-19.

Methods: Comparative, descriptive and retrospective analysis of two populations of adult patients affected by COVID-19 confirmed by antigen test or RT-PCR as well as CO-RADS 6 CT, who consented to be treated between 2020 and 2021, a population using oral baricitinib at a dose of 4mg/day/14 days and another using polymerized type I collagen intramuscularly at a dose of 1.5ml every 12 hours for 3 days, followed by 1.5ml every 24 hours for 4 days; The most affected age and gender, comorbidities and laboratory abnormalities are analyzed, as well as improvement in inflammatory and oxygenation indices measured by pulse oximetry and SAFI (SpO2/FiO2), finally the outcome of the patients and the presence of adverse events.

Results: 80 patients for each group, the most affected gender was male; the average age in the PTIC group was 51 years and in the baricitinib group it was 56 years; the main comorbidities were obesity, diabetes and hypertension in both groups; the decrease in acute phase reactants such as CRP, D-dimer and ferritin was greater in the PTIC group compared to the baricitinib group, the latter drug requiring a regimen of more days to achieve the objectives of the first drug (PTIC 7 days and baricitinib 14 days); Similarly, in oxygenation measured, the PTIC group reached goals in less time compared to the baricitinib group, which required twice as many days of treatment to achieve adequate oxygenation; Regarding the outcomes, there was a higher mortality in the baricitinib group compared to the PTIC group (6.25% vs 3.75%). Regarding adverse events reported for the PTIC group, they were minor and related to the intramuscular administration of the drug in 7 patients, while in the baricitinib group, 5 patients were reported with added bacterial pneumonia.

Conclusion: Polymerized type I collagen has anti-inflammatory and immunomodulatory potential similar to baricitinib in cases of moderate to severe COVID-19, even reaching treatment goals in less time both in inflammatory indices and in oxygenation indices

POSTER #8 Spirometric Findings in Patients Convalescing From Severe COVID-19 Pneumonia and Their Relationship With Immunomodulatory Agents Such as Dexamethasone and Polymerized Type I Collagen in Veracruz, Mexico

Del Carpio-Orantes L[1]

[1]*Instituto Mexicano Del Seguro Social, Veracruz , Mexico*

Introduction: Patients suffering from severe pneumonia due to COVID-19 may present various sequelae associated with acute inflammation that may persist chronically in patients, that make up the post-COVID syndrome, however, the main organ affected is the pulmonary system, so it is important to determine its post-COVID functionality.

Methods: Descriptive and retrospective study, adult patients who presented severe CO RADS 6 pneumonia with elevated inflammatory markers and decreased oxygenation index, who required non-invasive oxygen therapy and immunomodulatory drugs, are admitted; simple spirometry is performed 2 weeks after dispensing with the use of oxygen, according to ATS/ERS criteria, determining FEV1, FVC, and FEV1/FVC, and a comparison is made with the treatments they received in the acute stage (dexamethasone and Polymerized type I collagen). Known lung patients (including asthma and COPD) and obese (high incidence of restrictive pattern per se) are excluded.

Results: 60 patients divided into 2 groups were admitted to studies, the group that used dexamethasone in its acute stage and the group that used Polymerized type I collagen, the average age was 52 years, and the most affected gender was male (70%), the main comorbidities were diabetes, hypertension, and heart disease. Regarding the result of spirometry, there were greater alterations reported in the dexamethasone group compared to the Polymerized type I collagen tgroup, with the mild restrictive pattern predominating in 7 patients and 1 mild obstruction in the dexamethasone group, while in the polymerized collagen group, only one case with a mild restrictive pattern was reported, the rest of the spirometries were reported without alterations.

Conclusion: The main spirometric alterations are reported in the dexamethasone group, probably due to less control of inflammatory cytokines compared to polymerized type I collagen, which has a broad spectrum of control of proinflammatory cytokines and other elements that intervene in the inflammatory response, such as adhesion molecules. leukocyte, which ensures better control of this phenomenon that will ultimately lead to fewer sequelae or organic dysfunction that can condition chronic symptoms.

POSTER #9 Human Endogenous Retrovirus-K subtype HML-2 Envelope triggers TLR2 in Sporadic Amyotrophoc Lateral Sclerosis

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Amyotrophic Lateral Sclerosis (ALS) is a devastating rare neurodegenerative disease impacting nearly 5.2% of the U.S. population. Sporadic ALS (sALS) accounts for nearly 90% of all ALS cases, yet little is known regarding the cause and rapid disease progression. Upregulation of an endogenous retrovirus HERV-K subtype HML-2 has been found in the blood, spinal fluid and brain in a subset of sALS patients. The Envelope (Env) protein is neurotoxic and transgenic animals develop a motor neuron disease with neuronal loss and glial cell activation. We tested the hypothesis that HML-2 Env contributes to neuronal inflammation by activating the innate immune response through Toll-like receptors. We found that Env can bind to TLR-2 as determined by a pull-down assay followed by western blot and LC-MS analysis. To determine if Env could signal through TLR-2 we exposed monocyte-derived macrophages MDMs to Env and ; observed activation of NF-KappaB and production of proinflammatory cytokines in a dose-dependent manner. Since signaling through TLR2 requires a heterodimer formation of TLR 2/1 or 2/6 we utilized hTLR2-HEK-Blue cells to investigate heterodimer complex interaction. By using selective inhibitors MMG11, CU-CPT22, and anti-TLR2-IgA we demonstrate that blockage of these heterodimers inhibits NF-KappaB activation. Furthermore, inhibition of the TLR 2/6 heterodimer showed greater inhibition than TLR 2/1 validating previous computational data in an ALS cohort pointing to TLR 2/6 as significantly upregulated in brain of this population. Finally, to determine if this activation could impact on neuronal survival; we treated human neuronal cultures with supernatant from the activated MDMs and observed dose-dependent neuronal death. Tunnel staining showed that the cell death was due to apoptotic DNA breakage. Taken together we can demonstrate that in a subset of sALS patients HML-2 Env can signal through TLR-2 activating innate immune responses that contribute to neuronal toxicity.

POSTER #10 COVID-19 Associated Complement Activation and Inflammation in the Brain

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Objective: Although SARS-CoV-2 primarily targets the respiratory system, COVID-19 patients and survivors may experience neurological symptoms. A number of studies have shown that SARS-CoV-2 infection can damage microvessels in the brain, forming blood clots and leaking plasma proteins into the brain parenchyma, leading to neurological symptoms. However, the exact mode of damage is still unclear. Here, we studied the underlying mechanisms of cerebrovascular injury and subsequent inflammation of the brain parenchyma.

Methods: Autopsy brain tissues from 9 patients with COVID-19 (7 males and 2 females; age 24-73 years) were obtained from the Office of Chief Medical Examiner (OCME) of the City of New York and University of Iowa. All patients died within days to weeks of infection with minimal respiratory involvement during the first wave of the pandemic in 2020. Co-morbidities included diabetes (n=2, 22%), hypertension (n=1, 11%), hypertension and diabetes (n=1, 11%) and substance use disorder (n=2, 22%). Various brain regions including the olfactory bulb, frontal and temporal lobes, basal ganglia, hippocampus, thalamus, midbrain, pons, medulla oblongata, and cerebellum were studied using immunohistochemical analysis.

Results: We found immune complexes with deposition of components of the classical complement pathway on the microvascular endothelial cells in the brain. Multiplex immunofluorescence staining revealed that complements 1q, 4d (C1q, C4d), the membrane attack complex (MAC), IgG and IgM were deposited on the vascular endothelial cells in the brain of patients with COVID-19. When the MAC, the end product of the complement cascade, is formed on the endothelial cells, endothelial cells are activated and damaged, which can lead to blood-brain barrier (BBB) disruption and formation of microthrombi. Indeed, the brain tissues of all patients showed immunological features of microvascular injury. Microthrombi detected as intravascular CD61+ platelet aggregates were present in brain tissue and were associated with increased expression of platelet endothelial cell adhesion molecule 1 (PECAM-1) and increased von Willebrand factor (vWF) in patients with COVID-19. High immunoreactivity of plasma proteins such as fibrinogen and immunoglobulin was also found around the cerebral microvessels, indicating disturbed BBB integrity. Perivascular infiltrates, mainly composed of CD68+ macrophages and few CD8+ T cells, were found indicating a leaky BBB. Astrogliosis was also prominent in the perivascular regions. Microglial nodules were predominantly present in the hindbrain in association with focal neuronal loss and neuronophagia. There was a strong correlation between microvascular damage and inflammatory cell infiltration. We found no direct evidence of the presence of the virus in the brain.

Conclusions: This study provides valuable insights into the effects of SARS-CoV-2 on brain microvessels, which may explain the neurological symptoms seen in COVID-19 patients and survivors. Our findings identified complement activation to be a trigger of endothelial cell damage leading to disruption of the BBB, microthrombosis, perivascular inflammation, and neuronal injury. Immune complexes with complement components could be targeted for therapeutic intervention against COVID-19.

POSTER #11 Immune Responses Following COVID-19 Infection and Vaccination

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SARS-CoV-2 infection activates interferon-controlled signaling pathways and elicits a wide spectrum of immune responses and clinical manifestations in human patients. Here, we investigate the impact of fast-spreading variants and prior vaccination of hospitalized COVID-19 patients on the innate immune response through RNA sequencing of peripheral blood immune cells. Longitudinal transcriptome analyses reveal an active JAK-STAT-mediated immune transcriptome response at early stage of infection, the highly enhanced repones in vaccinated patients as compared to unvaccinated ones, and its subsidence by day 35. Additionally, the E484K in Alpha, Beta and Gamma variants was enriched for genes preferentially expressed in monocytes and linked to severe viral infection. Expression of the antiviral protein OAS1, which is inversely correlated with disease severity, and other key antiviral proteins increases in the vaccinated group. Next, we show the impact of homologous BNT162b2 and heterologous ChAdOx1-BNT162b2 vaccination on prior infected COVID-19 patients and naïve population. SARS-CoV-2 spike-specific IgG and neutralizing antibody response against the ancestral SARS-CoV-2 strain and variants including Omicron were boosted highly in prior infection and heterologous vaccination compared to naïve homologous vaccination. RNA-seq demonstrates activation of interferon-induced genetic programs, which persist in the previously infected and heterologous vaccination. A preferential increase of specific IGHV clonal transcripts that are the basis of neutralizing antibodies is observed in the previously infected individuals. scRNA-seq showed enrichment of B cell and CD4+ T cell responses following both vaccine regimen, but clonally expanded memory B cells were observed relatively stronger in the heterologous cohort. Our studies offer insights into distinct molecular immune responses elicited by SARS-CoV-2 variants and vaccination throughout the COVID-19 disease.

POSTER #12 CSF and Blood Biomarkers in Neurologic Post-acute Sequelae of SARS-CoV-2 Infection

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Background: Post-acute sequelae of SARS-CoV-2 infection (PASC) is defined by persistent and/or emergent symptoms weeks to months after the onset of acute COVID-19. PASC manifests a broad range of symptoms, many of which are neurologic. Despite the prevalence of neurologic symptoms of post-acute sequelae of SARS-CoV-2 infection, the inflammatory processes behind it are not well understood.

Methods: Participants with a history of laboratory-confirmed SARS-CoV-2 infection and ongoing or new neurologic symptoms were enrolled in The COVID Mind Study at Yale, an observational study that collected relevant clinical information, cerebrospinal fluid (CSF), and paired blood. Healthy controls (no history of COVID-19) were enrolled prior to the COVID-19 pandemic or enrolled prospectively and tested negative for SARS-CoV-2 nucleocapsid antibody. PASC participants were divided into severe neuro-PASC and neuro-PASC cohorts according to the severity of neuro-PASC symptoms; participants with severe neuro-PASC required hospitalization for acute neurological symptoms. Paired CSF and plasma samples were run on a human cytokine proinflammatory 15-plex array, human cardiovascular disease 9-plex array, high-sensitivity SIMOA-ELISA assay for markers of neuronal and astrocyte injury, and ELISA for neopterin, a marker of intrathecal macrophage/microglial activation. Comparisons between severe neuro-PASC, neuro-PASC, and healthy controls were made using non-parametric tests, with p-values adjusted for multiple comparisons.

Results: The severe neuro-PASC (n=9), neuro-PASC (n=36), and control (n=26) participants were similar in age (median 47, 50, 44 years). However, the severe neuro-PASC and neuro-PASC cohorts had a greater proportion of females (67% & 75% vs. 31%; p=0.003) and white participants (56% & 75% vs. 38%; p=0.0001) than the control cohort. Participants were assessed a median of 34 (severe neuro-PASC) or 345 (neuro-PASC) days after COVID-19 infection. The most common symptom reported in the severe-neuro PASC group was acute confusion and/or hallucinations (66%). In the neuro-PASC group, the most common symptoms were memory and concentration difficulties (72%), new or worsening anxiety (67%), and headaches (61%). No cytokines were significantly different ($p<0.05$) in the CSF between the severe neuro-PASC, neuro-PASC, and control cohorts. Two cardiovascular biomarkers associated with inflammation and coagulation were altered in the plasma of neuro-PASC compared to control individuals: Fetuin A36 was elevated and platelet factor 4 (PF4/CXCL4) was reduced (both adjusted $p<0.05$). Neurofilament light chain (NFL), a biomarker associated with axonal injury, was elevated (adjusted $p<0.05$) in both the plasma and CSF between severe neuro-PASC and control individuals but was not elevated in neuro-PASC vs control. No other neuronal, microglial, or astrocyte markers were significantly different ($p<0.05$) in the CSF and plasma between the three cohorts.

Conclusion: There are limited differences in CSF and blood biomarkers between participants with neurological symptoms after COVID-19 and control individuals. Elevation of CSF and plasma NFL in severe neuro-PASC, but not neuro-PASC, suggests a distinct neurologic process in a specific subset of individuals presenting with severe nervous system symptoms shortly after COVID-19. Future studies should include better gender and race matched controls and will examine immune profiles in a larger number of participants to further elucidate the underlying pathogenesis of neuro-PASC.

POSTER #13 The Human Gut Microbiome as a Source of Drugs for Chronic Inflammatory Diseases

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Chronic infection with hepatitis B virus (HBV) is associated with the development of progression of chronic liver disease (CLD) and the appearance of hepatocellular carcinoma (HCC). HCC is a prevalent cancer worldwide with few treatment options. Most of the treatments available are for patients with advanced cancer, and the results have been very modest because these are the patients most difficult to treat. A different way of thinking involves recognizing and reducing the risk factors that contribute to the pathogenesis of HCC. Given that HCC develops decades after HBV infection, and appears most often on the background of chronic inflammation, experiments were designed to test the hypothesis that gut bacteria derived short chain fatty acids, known to suppress inflammation, could be used as a simple, readily available, and inexpensive means to target CLD so as to prevent or delay the appearance of HCC.

To test this hypothesis, hepatitis B x (HBx) transgenic mice, which develop CLD that culminates in the appearance of HCC, were treated with a mixture of short chain fatty acids. HBx is the oncoprotein of HBV that epigenetically alters host cell gene expression by activating multiple signaling pathways in the cytoplasm and stimulating histone deacetylase activity in the nucleus. In the transgenic mice, all develop hepatitis by 6 months of age, dysplasia by 9 months, and visible HCC by 12 months of age. Accordingly, HBx transgenic mice were fed a combination of SCFAs from 9-12 months of age and then euthanized. SCFA-fed mice had significantly fewer dysplastic ($P < 0.05$) and HCC nodules at 12 months of age compared to controls ($P < 0.001$). Among tumor bearing animals, SCFA treated mice had mostly small (< 0.5 cm diameter) and medium (0.5-1 cm diameter) sized tumors instead of large tumor nodules (> 1 cm diameter) compared to PBS treated mice ($P < 0.001$). Pathway analysis of SCFA fed mice showed down-regulation of signaling pathways altered by HBx in human CLD and HCC, including those involved in inflammation, Wnt, FGF, PI3K, EGF, IGF and Ras. Treatment with SCFAs was also associated with decreased activity of the Ras pathway, which is constitutively activated by HBx. Many of these signaling pathways cross-talk with NF--B, are activated by HBx, and inhibited by SCFAs. This suggests that down-regulation of NF--B is key to the mechanism whereby SCFAs delay the onset of HCC. In vitro work showed that SCFAs reduced cell viability in HBx-transfected human HCC cell lines in a dose-dependent manner while the viability of primary human hepatocytes was unaffected, indicating that SCFA treatment has low or little toxicity to non-tumor cells. Thus, SCFAs delay the pathogenesis of HBV-associated HCC, possibly through inhibiting signaling via the pro-inflammatory NF--B, suggesting that they may be a simple, effective intervention against HBV associated CLD and HCC. This approach may also be useful delaying the development of other cancers that that arise on the background of chronic inflammation.

POSTER #14 An Imbalanced Gut Microbial Colony in Older HIV-infected Adults on ART is Associated with Inflammation, Monocyte Chemotaxis, and Cognitive Impairment

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People aging with HIV (PAWH) experience a greater burden of multi-morbidities compared to their uninfected counterparts likely driven by complex multifactorial mechanisms that remain larger undefined. Alterations in the gut microbiome and its metabolites are common in PAWH. We investigated relationships between microbial communities among older PAWH on ART with measures of disease progression including the degree of atherosclerosis and cognitive performance.

A case-control study (n=143) compared PAWH on stable ART, age ≥40 years to demographically similar HIV-seronegatives. A subset (n=50; 25 PAWH, 25 uninfected controls) provided stool for 16S ribosomal-RNA sequencing using Illumina's MiSeq platform and quantified by Qiime2. B-mode ultrasound images of the right common carotid artery and internal carotid bifurcation assessed subclinical atherosclerosis. Neuropsychological (NP) testing assessed multiple cognitive domains and were converted to z-scores. Seven participants declined NP testing. Several soluble mediators were assessed by Luminex. Relationships between continuous variables were assessed using Spearman correlations. All comparisons were adjusted for FDR.

Participants were predominantly older (median 60.3 years), Caucasian (63.6%) males (93.2%) with no differences in age, gender, race, or education (all $p \geq 0.255$) between PAWH and controls. We observed no differences in alpha diversity ($p=0.879$) by HIV-status. Relative abundance of Erysipelotrichales was elevated in PAWH compared to controls ($p=0.012$) and associated with plasma CCL2/MCP-1 ($r=0.667$, $p<0.001$) and psychomotor speed z-scores ($r=-0.739$, $p<0.001$) in PAWH, but not in controls ($p=0.903$ & 0.964, respectively). We found a positive correlation between Erysipelotrichales and plasma IL-6 levels ($r=0.577$, $p=0.005$) in PAWH, however a negative relationship ($r=-0.421$, $p=0.051$) was observed in controls. No associations were observed between microorganism abundances and measures of subclinical atherosclerosis (all $p \geq 0.626$).

Our analyses identify Erysipelotrichales as a putative gut microbe linked to the neuropathogenesis of CNS injury in older PAWH illuminating an unappreciated gut-brain axis and target for restoration of microbial dysbiosis.

POSTER #15 Laboratory Biomarkers of COVID 19 Disease Severity and Outcome: Findings from Developing Country

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Objective: To identify laboratory biomarkers that predict disease severity and outcome among COVID-19 patients admitted to the Millennium COVID-19 Care Center in Ethiopia.

Methods: A Prospective cohort study was conducted among 429 COVID-19 patients who were on follow up from July to October 2020. Data was described using frequency tables Robust Poisson regression model was used to identify predictors of COVID-19 severity where adjusted relative risk (ARR), P-value and 95CI for ARR were used to test significance. Binary Logistic regression model was used to assess the presence of statistically significant association between the explanatory variables and COVID-19 outcome where adjusted odds ratio(AOR), P-value and 95% CI for AOR were used for testing significance.

Results: Among the 429 patients studied,182(42.4%) had Severe disease at admission and the rest 247(57.6%) had Non-severe disease. Regarding disease outcome,45(10.5%) died and 384 (89.5%) were discharged alive. Age group (ARR=1.779,95%CI=1.405–2.252, p value <0.0001), Neutrophil to Lymphocyte ratio (NLR) (ARR=4.769,95%CI=2.419–9.402 p-value <0.0001), Serum glutamic oxalo acetic transaminase (SGOT) (ARR=1.358, 95%CI=1.109–1.662p-value=0.003), Sodium (ARR=1.321,95%CI=1.091–1.600 p value=0.004) and Potassium (ARR=1.269,95%CI=1.059–1.521p-value=0.010) were found to be significant predictors of COVID-19 severity. The following factors were significantly associated with COVID-19 outcome; age group (AOR=2.767,95%CI=1.099–6.06, p value=0.031), white blood cell count (WBC) is one of the complete cell counts (AOR=4.253,95%CI=1.918–9.429, p-value=0.0001) and sodium level (AOR=3.435,95%CI= 1.439–8.198, p-value=0.005).

Conclusions: Assessing and monitoring the laboratory biomarkers of WBC, NLR, SGOT, sodium and potassium levels at the earliest stage of the disease could have a considerable role in halting disease progression and death.

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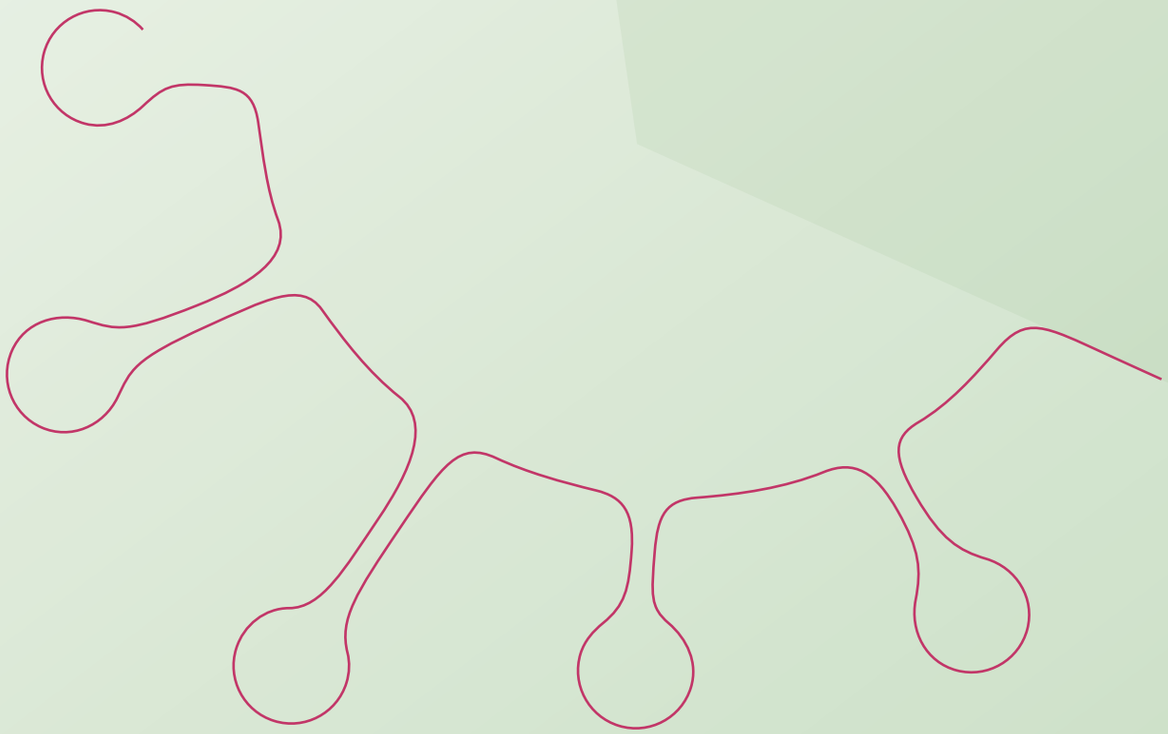

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