



American
Autoimmune
Related Diseases Association, Inc.

DISCUSSION OVERVIEW

15TH ANNUAL NOEL ROSE SCIENTIFIC COLLOQUIUM
MAY 1, 2021

On Saturday, May 1st, 2021, the American Autoimmune Related Disease Association (AARDA) hosted the 15th Noel Rose Scientific Colloquium, bringing together high-level researchers from different areas and different specialties to address and focus on areas and topics that would benefit from information exchange and to help identify areas of opportunity for future autoimmune disease research. Participants heard directly from leading autoimmune experts, who shared how their past work on autoimmune diseases helped them pivot to study, understand, and generate hypotheses on how to combat the COVID-19 virus. **The goals for this meeting were:**

1. Increase cross-fertilization and collaboration among researchers with the aim to break down some of the historic silos that have hindered autoimmune research.
2. Stimulate researchers to think about autoimmune diseases from a broader perspective than through the lens of the one disease they are focused on.
3. Relate how previous work on autoimmune diseases has helped researchers identify pathways in combating the COVID-19 virus.

Moderated by AARDA's founder and past president, Virginia Ladd, the day's event kicked off with a short tribute to the late great Dr. Noel Rose, who passed away last year at the age of 93. After some short remarks, Ms. Ladd passed it over to Dr. Joe McCune and Dr. Jason Knight, both from the University of Michigan, who played a major role in supporting this year's event, for a series of opening thoughts.

Dr. McCune and Dr. Knight's introductions were followed by a series of twenty-minute presentations by experts who shared their research into topics at the intersection of autoimmunity and COVID-19. **The panelists included:**

- > **Judith A. James, M.D., Ph.D.**, Oklahoma Medical Research Foundation Vice President of Clinical Affairs
 - ***Presentation Title: Viral Induced Autoimmunity: Lessons from EBV/SLE for COVID-19***

Dr. James discussed her working model which showed that genetic risk can be tied with environmental factors. She said this helps explain how a patient with the wrong genetic predisposition can have an abnormal immune response to a common infection. Dr. James then discussed a topic that she has researched extensively over the years: the possible mechanisms of infection-driven autoimmunity. In closing, Dr. James shared how her work on autoimmune diseases has translated into her recent observation of patients' short- and long-term COVID-19 responses. Unfortunately, just as she worried, patients who already had underlying dysregulated immune systems experienced post-COVID symptoms at a much higher rate than other non-autoimmune disease patients.

- > **David Alan Hanauer, M.D.**, Director of Michigan Institute for Clinical and Health Research Informatics Program, Associate Professor of Learning Health Science, Associate Professor of Informatics, School of Information and Clinical and Associate Professor of Pediatrics at the University of Michigan

- ***Presentation Title: How Electronic Medical Records (EMRs) Can Unlock Unexpected Connections***

Dr. Hanauer shared how EMRs, which capture data on millions of patients nationwide, can allow researchers to conduct large scale analysis to look for rare associations in diseases. Dr. Hanauer stated that for rare diseases, a single clinician or single institution may never see enough cases ever to notice a pattern. There may be some patterns that exist, he predicted that could be detectable if a researcher looks at enough cases enough times. He argued that EMRs allow researchers to look at massive data sets to find these relationships. Dr. Hanauer stated his goal is to get his EMR analysis into the hands of other researchers who can apply its data mining capabilities to their own areas of research.

- > **Sharon Fox, M.D.**, Associate Director of Research and Development in the Department of Pathology at LSU Health Sciences Center, New Orleans, and Anatomic Pathologist at Southeast Louisiana Veterans Health System

- ***Presentation Title: The Damage Wrought By Severe COVID-19: Autopsy Studies From New Orleans***

Dr. Fox discussed her findings from studying the autopsies of some of the very first Americans to die from COVID-19. Due to her proximity to New Orleans, one of the first cities in the country to experience community spread of the virus, she was able to study some of the first COVID-19 victims in March and April of 2020. Dr. Fox concluded that COVID-19 has many pathologic features consistent with autoimmune disease, most notably involving small to medium-sized vascular structures. In addition, multiple organs can be affected, which she stated is consistent with an autoimmune and or vascular disease.

- > **Puja Mehta, M.D.**, University College London, Center for Inflammation Ryan Institute

- ***Presentation Title: Hyperinflammation And Cytokine Storms in COVID-19***

Dr. Mehta focused on the clinical aspects of hyperinflammation and the cytokine storm. Dr. Mehta believes in severe cases of COVID-19, there's sufficient evidence that a subgroup of patients with hyperinflammation can be identified using routine biomarkers or composite scores She concluded that post-hyperinflammatory responses may improve the survival rates of patients.



After a short break, a second group of experts shared their research, which attempted to answer the question: Is COVID-19 and Autoimmune Disease? **The panelists included:**

- > **Carlo Selmi, M.D., Ph.D.**, Director of the Residency School of Emergency Medicine, Humanitas University
 - **Presentation Title: Features Of COVID-19 That Mimic Rheumatic Diseases**
Dr. Selmi discussed his determination that several features of COVID-19 mimic rheumatological conditions. He stated that this classification could yield what he described as some “unconventional” treatment options. He pointed out how the conditions’ similarities resulted in nearly every known rheumatological treatment to be proposed to treat COVID-19. In conclusion, Dr. Selmi stated that immune-rheumatology is key to medicine and that, given what we know now about COVID-19, all prior assumptions about the rheumatology practice need to be reconsidered.

- > **Ignacio Sanz, M.D.**, Professor of Medicine and Chief, Division of Rheumatology at Emory University School of Medicine, Director of the Lowance Center of Human Immunology at Emory University and Children’s Healthcare of Atlanta
 - **Presentation Title: B Cell Effector Pathways In Autoimmunity and COVID-19 Infection**
Dr. Sanz, tapping his extensive research about the role of B cells in autoimmune diseases, shared that he was able to determine that severe Covid-19 infections correlate with B cell and antibody autoreactivity, despite the presence of high titers of neutralizing antibodies. In contrast, he stated that less severe and asymptomatic infections may be better able to mount protective responses devoid of undesired pathogenic consequences through preservation of well-regulated GC reactions. In conclusion, Dr. Sanz stated his belief in the possibility that autoantibodies in severe cases of COVID-19 could be either pre-existent or newly formed.

- > **Jean-Laurent Casanova, M.D., Ph.D.**, Levy Family Professor, Investigator at the Howard Hughes Medical Institute, Head of the St. Giles Lab of Human Genetics of Infectious Diseases
 - **Presentation Title: Genetic and Immunological Causes Of Life-Threatening COVID-19**
Dr. Casanova explained his research which aimed to identify root cause of lethal or life threatening COVID-19. Dr. Casanova focused his research on his hypothesis that there are “clinically silent” autoantibodies in some humans. Dr. Casanova shared his findings, which showed that a large proportion of people with these autoantibodies were administered to ICUs with COVID-19 induced pneumonia. This, he concluded, proved the linkage between COVID-19 outcomes and genetic predispositions.

- > **Jason Knight, M.D., Ph.D.**, Associate Professor, Department of Internal Medicine, Division of Rheumatology, and Associate Director of the Lupus Program at the University of Michigan
 - **Presentation Title: What Can Queen Anne’s Lupus Teach Us About COVID-19?**
Dr. Knight discussed his research about Antiphospholipid Syndrome (APS) and shared how his decades of research on the topic greatly helped him when APS was first found in serum from patients hospitalized with COVID-19. He stated that about half of the hospitalized patients that he examined had at least small traces of APS, which lead him and his team to believe there is some sort of link between the two conditions. Dr. Knight concluded by stating that the implications of his research on APS could help the scientific community better understand COVID-19.



After lunch, the session continued with a series of presentations in which researchers shared their work on novel antibodies and related their findings to the COVID-19 virus. **The panelists included:**

- > **Yogen Kanthi, M.D.**, Vascular Medicine Lasker Investigator at the National Heart, Blood and Lung Institute
 - ***Presentation Title: Endotheliopathy And The Role Of Autoimmunity***
Dr. Kanthi talked about how the feed-forward loop that inflammation and coagulation undergo to heal wounds in the human body can, when unrestrained, lead to vascular thrombosis and other inflammatory complications. Dr. Kanthi noted that these issues were found in COVID-19 patients, and that his research on the topic helped him identify and understand the relationship between the virus and the condition.

- > **Aaron Ring, M.D., Ph.D.**, Assistant Professor of Immunobiology at the Yale School of Medicine
 - ***Presentation Title: Diverse Functional Autoantibodies In Patients With COVID-19***
Dr. Ring discussed what can be learned from rare autoantibody responses in patients. As it relates to COVID-19, Dr. Ring observed that COVID patients had “remarkable” levels of autoreactivity. He was able to identify this pattern through his Rapid Extracellular Protein Antigen Profiling (REAP) platform. In his conclusion, Dr. Ring credited this platform in detecting interesting functional autoantibodies against extracellular proteins and identifying some novel antibodies that could explain intra-individual variation in outcomes.

- > **Julia Y. Wang**, Founder and CEO of Curandis
 - ***Presentation Title: Towards A Comprehensive Autoantigen Atlas Of COVID-19***
Dr. Wang shared her progress towards establishing a comprehensive autoantigen atlas of COVID-19. She credited her team’s development of unique methods for discovering autoantigens as the catalyst behind their findings. Thus far, her team has identified about 400 putative autoantigens with over 200 of them having been confirmed as autoantigens. Through these findings, Dr. Wang and her team have concluded that COVID-19 is associated with a large and diverse pool of autoantigen targets, and that these targets provide clues to neurological problems, musculoskeletal problems, fibrosis and thrombosis.



After the session's third and final break, the group reconvened to hear presentations from another crop of autoimmune researchers. **The panelists included:**

- > **Alexis Combes, Ph.D.**, UCSF Disease to Biology CoLab director
 - ***Presentation Title: What Can COVID-19 Profiling Teach Us About Therapeutic Targets?***
Dr. Combes shared what his cohort at UCSF has uncovered about COVID-19. His team found that an overzealous antibody response in COVID-19 patients pitted the immune system against itself. Dr. Combes theorized that this mechanism may play out in other viral infections, and that it would be worthwhile for the scientific community to look into the topic.

- > **Russell P. Tracy, Ph.D., FAHA**, University Distinguished Professor of Pathology & Laboratory Medicine and Biochemistry, Director of the University of Vermont Laboratory for Clinical Biochemistry Research
 - ***Presentation Title: Do We Need More High-Throughput Screening in Autoimmunity?***
Dr. Tracy discussed the implications of his team's research on coagulation in cardiovascular diseases. He concluded by encouraging those in attendance to inquire about the Collaborative Cohort of Cohorts for COVID-19 Research (C4R), which is in the process of conducting a large-scale study about the long-term effects that COVID-19 has on the human body.

- > **PJ Utz, M.D.**, Professor of Medicine at Stanford University
 - ***Presentation Title: Is PASC An Autoimmune Disease?***
Dr. Utz talked about his team's research into whether long-term COVID-19 should be considered an autoimmune disease. He discussed his team's evaluation of patients who either had a pre-existing auto-immune disease or preclinical disease and tried to determine whether they were at greater risk to develop a more severe case of COVID-19. In conclusion, Dr. Utz postulated that new autoantibodies developed from COVID-19 could be directly pathogenic, and that some of these could be potentially associated with long-term outcomes, including PASC.

The event concluded with a capstone discussion, in which the researchers asked each other questions and clarified certain items that were discussed during the event. In total, the event, which was filled with a robust transfer of thoughts and ideas, lasted a little over seven hours long. **Topline Conclusions:**

1. Experts generally agreed that there is a high degree of overlap between the study of autoimmune diseases and COVID-19.
2. Guests affirmed their commitment to both a collaborative and holistic approach to the study of autoimmune diseases and COVID-19.
3. AARDA successfully provided a platform for the nation's top autoimmune disease researchers to share their work and cross-pollinate their ideas.

