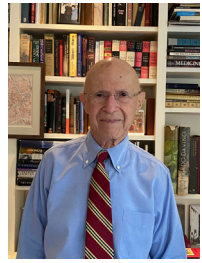
Preface

Perspectives on Antibodies Against Severe Acute Respiratory Syndrome Coronavirus 2 and Its Implications for Diagnostics, Biology, and Clinical Management



Daimon P. Simmons, MD, PhD

Peter H. Schur, MD, MACR, MACP, MAAAS

Editors

When the pandemic coronavirus disease 2019 (COVID-19) swept around the world in early 2020, diagnostic testing moved into the spotlight. Although molecular diagnostic tests have been a mainstay in identification of patients infected with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, detection of viral nucleic acids may be limited to the initial phase of infection. Detection of anti-SARS-CoV-2 antibodies complements molecular testing as a method of detecting previously infected individuals. A large number of assays were rapidly released due to the urgent need for diagnostics in this pandemic, highlighting the need for rigorous quality control and assay evaluation. With more recent availability of vaccines, the diagnostic role of anti-SARS-CoV-2 antibody detection has shifted to distinguish natural infection from effective response to a vaccine. In this issue of *Clinics in Laboratory Medicine*, a breadth of reviews describe the role of antibodies in this pandemic but also provide unique perspectives about different aspects of serologic testing for SARS-CoV-2.

The reviews in this issue describe the timing and durability of antibody responses, which are critical factors in the interpretation of these serology results. The distinction between detection of binding antibodies and neutralizing antibodies that may confer clinical immunity is another important recurring theme. There are also important

Clin Lab Med 42 (2022) xi–xiii
https://doi.org/10.1016/j.cll.2021.12.001
0272-2712/22/

perspectives that are shared between multiple reviews, including information and guidelines on the evaluation of different assays. Some articles detail the immunologic responses involved in immune responses to SARS-CoV-2, along with some that comment on implications of new SARS-CoV-2 variants. Finally, there are perspectives about the importance of antibodies in clinical management and vaccination.

There are many unique perspectives included among these reviews. In "Severe Acute Respiratory Syndrome Coronavirus 2 Serology Testing: A Laboratory Primer," Patricia Slev provides a general primer on the topic, including recommendations for assay evaluation. Elitza Theel describes differences in technical performance of different assays in "Performance Characteristics of High-Throughput Serologic Assays for Severe Acute Respiratory Syndrome Coronavirus 2 with Food and Drug Administration Emergency Use Authorization: A Review," mentioning the particular importance of high specificity in diagnostic testing. The article "Performance Evaluation of Lateral Flow Assays for Coronavirus Disease 2019 Serology" by Lucy Ochola and colleagues provides a perspective on cost-effective approaches, particularly lateral flow assays, to define seroprevalence globally. Rashmi Patel and colleagues expand on technical details of different antibody detection methods in their article, "Alternative Methods to Detect Severe Acute Respiratory Syndrome Coronavirus 2 antibodies." Shiv Pillai focuses on the biology of germinal center responses and the overly exuberant immune responses that impair B-cell responses in "Suboptimal Humoral Immunity in Severe Acute Respiratory Syndrome Coronavirus 2 Infection and Viral Variant Generation." In their article "Antibody Dynamics and Durability in Coronavirus Disease 2019," Adam Zuiani and Duane Wesemann describe the immunologic details of B-cell activation and development of effective antibodies related to COVID-19. Alana Ogata and colleagues describe clinical implications of anti-SARS-CoV-2 antibodies in the article "Coronavirus Antigens as Targets of Antibody Responses," including discussion of antibodies in diagnosis of pediatric inflammatory syndromes. The issue concludes with an article by Amy Sherman and colleagues, "Vaccine-induced Severe Acute Respiratory Syndrome Coronavirus 2 Antibody Response and the Path to Accelerating Development (Determining a Correlate of Protection)," with a focus on the interpretation of these antibodies in context of vaccines.

This issue of *Clinics in Laboratory Medicine* brings together important perspectives on antibodies against SARS-CoV-2, including immunology, infectious disease, clinical diagnostics, and clinical management. Anti-SARS-CoV-2 antibodies can reflect past infection of an individual with this virus, but they also help identify effective immune responses, either to viral infection or to vaccination. The shared perspectives and

unique information provided in these review articles help to illuminate persistent questions and evolving knowledge about diagnostic testing in the COVID-19 pandemic.

Daimon P. Simmons, MD, PhD
Department of Pathology
Brigham and Women's Hospital
75 Francis Street
Boston, MA 02115, USA

Peter H. Schur, MD, MACR, MACP, MAAAS
Division of Rheumatology
Brigham and Women's Hospital
75 Francis Street
Boston, MA 02115, USA

E-mail addresses:
dsimmons4@bwh.harvard.edu (D.P. Simmons)
pschur@bwh.harvard.edu (P.H. Schur)