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INTRODUCTION

Talal A. Chatila, M.D., and Paul Krogstad, M.D. are the Guest Editors for this special all-review issue in infections and immunity. Dr. Chatila is the Chief of the Division of Pediatric Immunology, Allergy and Rheumatology, and Dr. Krogstad is Professor of Pediatrics in the Division of Pediatric Infectious Disease in the Department of Pediatrics at the David Geffen School of Medicine at UCLA.

Crouching Tigers, Hidden Dragons: The Interplay of Pathogens and Hosts

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During the past decade, there has been a dramatic expansion in our understanding of the mechanistic underpinnings of innate and adaptive immune responses, yielding important insights into the pathophysiology of infectious and autoimmune diseases. In addition, a series of new respiratory viruses have been discovered, and drug-resistant microbes, such as community-acquired methicillin-resistant *Staphylococcus aureus* and broadly resistant plasmodium species, have become common foes. The contributions to this special issue were selected to provide to the readership of *Pediatric Research* a broad and insightful overview of these topics.

Reviews by Notarangelo and coworkers, Bonilla and Geha, and Su and Anderson (1–3), grouped under the heading of "Inheritable Disorders of the Immune System," summarize how examination of monogenic immunodeficiency and autoimmunity disorders and genome-wide association studies have helped reveal novel pathways of innate and adaptive immunity and of mechanisms involved in immunologic tolerance. At a higher level of complexity, Eisenstein and Williams (4) detail the relationship between two recently described T cell subsets that serve opposing functions: regulatory T cells, which play an essential role in peripheral tolerance, and T helper type 17 (Th17) cells, which promote inflammatory responses. As detailed by Freeman and Holland (5), the recently described mutations in STAT3 in the hyper IgE (Job's) syndrome are associated with failed development of Th17 cells. Accordingly, this disease has proven highly informative in understanding the role of Th17 cells in immunity to specific pathogens including *S. aureus* and *Candida* species. Additionally, fundamental breakthroughs in our understanding of triggering and effector mechanisms involved in innate immunity came from the genetic and functional characterization of autoinflammatory disorders, detailed in the review by McGonagle *et al.* (6). As discussed by Walker and Modlin and Philbin and Levy (7,8), we may be able to exploit our understanding of the developmental differences in innate immune responses to enhance or focus the efficacy of immunomodulators and vaccines.

Other contributions to this special issue focus on the pathogens themselves. A survey by Liu (9) broadly reviews the molecular and clinical peculiarities of the so-called community-acquired methicillin *S. aureus* strains that contribute to the recent worldwide rise in life-threatening staphylococcal disease. Travassos and Laufer (10) tackle the issue of antimalarial drug resistance, a problem fundamental to the resurgence of malaria as a global threat. The discovery of the human bocavirus and human metapneumovirus, reviewed by Milder and Arnold (11), has broadened the list of suspects for both mild and severe respiratory disease in children.

In some cases, the balance between the virulence of microbes and genetic properties of the host determine the outcome of infection. This theme is central to the review by Singh and Spector (12), which examines the impact of host genetic determinants on the outcome of HIV infection in children, the article by Viscardi and Hasday (13), which examines the immunopathology of ureaplasma infections and their putative link to chronic lung disease in infants, and the analysis of biomarkers of necrotizing enterocolitis in neonates as clues to pathogenesis by Young *et al.* (14). On a related note, Onouchi (15) provides a review of the recent studies of molecular genetics of Kawasaki disease, which may help explain the well-described ethnic predisposition of this disorder seen in certain populations.

Thus, we hope that the articles in this special edition will assist readers by providing a broad conceptual overview of the recent developments in our understanding of the interplay between infection and immunity, and the basis for well-known, but often poorly understood, immunodeficiency, autoimmunity, and inflammatory disorders.

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REFERENCES

1. Pessach I, Walter J, Notarangelo LD 2009 Recent advances in primary immunodeficiencies: identification of novel genetic defects and unanticipated phenotypes. Pediatr Res 65:3R–12R
2. Bonilla FA, Geha RS 2009 Common variable immunodeficiency. Pediatr Res 65:13R–19R
3. Su MA, Anderson MS 2009 Monogenic autoimmune diseases: insights into self-tolerance. Pediatr Res 65:20R–25R
4. Eisenstein EM, Williams CB 2009 The T_{reg}/Th17 cell balance: a new paradigm for autoimmunity. Pediatr Res 65:26R–31R
5. Freeman AF, Holland SM 2009 Clinical manifestations, etiology, and pathogenesis of the hyper-IgE syndromes. Pediatr Res 65:32R–37R
6. McGonagle D, Aziz A, Dickie LJ, McDermott MF 2009 An integrated classification of pediatric inflammatory diseases, based on the concepts of autoinflammation and the immunological disease continuum. Pediatr Res 65:38R–45R
7. Walker VP, Modlin RL 2009 The vitamin D connection to pediatric infections and immune function. Pediatr Res 65:106R–113R
8. Philbin VJ, Levy O 2009 Developmental biology of the innate immune response: implications for neonatal vaccine development. Pediatr Res 65:98R–105R
9. Liu GY 2009 Molecular pathogenesis of *Staphylococcus aureus* infection. Pediatr Res 65:71R–77R
10. Travassos MA, Laufer MK 2009 Resistance to antimalarial drugs: molecular, pharmacological and clinical considerations. Pediatr Res 65:64R–70R
11. Milder E, Arnold JC 2009 Human metapneumovirus and human bocavirus in children. Pediatr Res 65:78R–83R
12. Singh KK, Spector SA 2009 Host genetic determinants of human immunodeficiency virus infection and disease progression in children. Pediatr Res 65:55R–63R
13. Viscardi RM, Hasday JD 2009 Role of *Ureaplasma* species in neonatal chronic lung disease: epidemiologic and experimental evidence. Pediatr Res 65:84R–90R
14. Young C, Sharma R, Handfield M, Mai V, Neu J 2009 Biomarkers for infants at risk for necrotizing enterocolitis: clues to prevention? Pediatr Res 65:91R–97R
15. Onouchi Y 2009 Molecular genetics of Kawasaki disease. Pediatr Res 65:46R–55R