

JULY 1998

Volume 11 Number 3

# Clinical Microbiology Reviews

WESTON LIBRARY

JUL 24 1998

1001 CLINICAL SCIENCES CENTER  
600 HIGHLAND AV-MADISON, WI 53792

Published  
quarterly by  
the American  
Society for  
Microbiology

# CLINICAL MICROBIOLOGY REVIEWS

VOLUME 11 • JULY 1998 • NUMBER 3

**Betty A. Forbes**, *Editor in Chief* (2002)  
*SUNY Health Science Center*  
*Syracuse, N.Y.*

**Lynne S. Garcia**, *Editor* (2002)  
*UCLA Medical Center*  
*Los Angeles, Calif.*

**Kenneth D. Thompson**, *Editor* (2002)  
*University of Chicago Medical Center*  
*Chicago, Ill.*

## EDITORIAL BOARD

**Judith E. Damer** (1999)  
**Kevin Hazen** (1998)

**J. Michael Miller** (2000)  
**Andrew Onderdonk** (2000)  
**Daniel F. Sahn** (1998)

**Steven C. Specter** (2000)  
**Gregory A. Storch** (1998)

**Barbara H. Iglewski**, *Chairman, Publications Board*  
**Beverley J. Bennett**, *Production Editor*

**Linda M. Illig**, *Director, Journals*  
**Victoria A. Cohen**, *Assistant Production Editor*

*Clinical Microbiology Reviews* considers for publication both solicited and unsolicited reviews and monographs dealing with all aspects of clinical microbiology. Manuscripts, proposals, and correspondence regarding editorial matters should be addressed to the Editor in Chief, Betty A. Forbes, Department of Clinical Pathology, SUNY Health Science Center, 750 East Adams St., Syracuse, NY 13210-2339.

*Clinical Microbiology Reviews* (ISSN 0893-8512) is published quarterly (January, April, July, and October), one volume per year, by the American Society for Microbiology (ASM). Nonmember print subscription prices (per year) are: \$146, U.S.; \$150, Canada (plus 7% GST, or 7% GST + 8% HST where applicable); \$168, Europe; \$169, Latin America; \$170, rest of world. Member print subscription prices (per year) are: \$40, U.S.; \$43, Canada (plus 7% GST, or 7% GST + 8% HST where applicable); \$53, Europe; \$54, Latin America; \$55, rest of world. Singles copies are: \$47, nonmember; \$15, member (Canadians add 7% GST, or 7% GST + 8% HST where applicable). For prices of CD-ROM versions, missing issues, and availability of back issues should be directed to the Subscriptions Unit, ASM. Correspondence relating to subscriptions, defective copies, missing issues, and correspondence relating to reprint orders should be directed to the Reprint Order Unit, ASM; and correspondence relating to disposition of submitted manuscripts, proofs, and general editorial matters should be directed to the Journals Department, American Society for Microbiology, 1325 Massachusetts Ave., N.W., Washington, DC 20005-4171. Phone: (202) 737-3600.

Claims for missing issues from residents of the United States, Canada, and Mexico must be submitted within 3 months after publication of the issues; residents of all other countries must submit claims within 6 months of publication of the issues. Claims for issues missing because of failure to report an address change or for issues "missing from files" will not be allowed.

CODEN: CMIREX

Periodicals postage paid at Washington, DC 20005, and at additional mailing offices.

POSTMASTER: Send address changes to *Clinical Microbiology Reviews*, ASM, 1325 Massachusetts Ave., N.W., Washington, DC 20005-4171.

Made in the United States of America. Printed on acid-free paper.

Copyright © 1998, American Society for Microbiology.

All Rights Reserved.

WESTON LIBRARY

JUL 24 1998

35/120 CLINICAL SCIENCES CENTER  
510 HIGHLAND AV-MADISON, WI 53792

The code at the top of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal use or for personal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per-copy fee through the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, for copying beyond that permitted by Sections 107 and 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale.



# Clinical Microbiology Reviews

A Publication of the American Society for Microbiology

VOLUME 11 • JULY 1998 • NUMBER 3

---

## CONTENTS/SUMMARIES

**Kawasaki Syndrome.** Anne H. Rowley and Stanford T. Shulman... 405-414

*Summary: Kawasaki syndrome (KS) is an acute, sometimes fatal vasculitis of young children. KS has replaced acute rheumatic fever as the most common cause of acquired heart disease in children in the United States. The illness is manifested by prolonged fever, conjunctival injection, enanthem, exanthem, erythema and swelling of the hands and feet, and cervical adenopathy. These acute features of illness are self-limiting, but coronary artery abnormalities occur in 20% of untreated patients. The etiology of the illness is unknown, but its clinical and epidemiologic features are most consistent with an infectious cause. Common cardiovascular manifestations of the illness include myocarditis, pericardial effusion, and coronary artery aneurysm formation. Treatment with intravenous gamma globulin (IVGG) and aspirin within the first 10 days of illness reduces the prevalence of coronary artery abnormalities from 20% in those treated with aspirin alone to 4%. Patients who develop coronary artery aneurysms, particularly those who develop giant coronary artery aneurysms, may suffer myocardial infarction secondary to thrombosis or stenosis in the abnormal vessel. Additional research to determine the cause of KS is urgently needed to allow for improved diagnosis, more specific therapy, and prevention of the disorder.*

**Onychomycosis: Pathogenesis, Diagnosis, and Management.** Boni E. Elewski ..... 415-429

*Summary: Although not life-threatening, onychomycosis (a fungal infection of the nail, usually caused by a dermatophyte) constitutes an important public health problem because of its high prevalence (about 10% of the U.S. population) and associated morbidity. The disease can have certain negative consequences for patients, such as pain, and can potentially undermine work and social lives. This review discusses the etiology, classification, diagnosis, and treatment of onychomycosis. Four types of onychomycosis are recognized based on the site and pattern of fungal invasion. Dermatophyte fungi are the predominant pathogens, but yeasts (especially *Candida albicans*) and nondermatophyte molds may also be implicated. Accurate diagnosis requires direct microscopy and fungal culture. The differential diagnosis includes psoriasis, lichen planus, onychogryphosis, and nail trauma. Onychomycosis is more difficult to treat than most dermatophytoses because of the inherent slow growth of the nail. Older antifungal agents (ketoconazole and griseofulvin) are unsuitable for onychomycosis because of their relatively poor efficacy and potential adverse effects. Three recently developed antimycotic agents (flucanazole, itraconazole, and terbinafine) offer high cure rates and good safety profiles. In addition, the short treatment times (<3 months) and intermittent dosing schedules are likely to enhance compliance and reduce the costs of therapy.*

Continued on following page

Continued from preceding page

**Respiratory Syncytial Virus Vaccines.** Robert A. Dudas and Ruth A. Karron..... 430-439

*Summary: Respiratory syncytial virus (RSV) is the most important cause of viral lower respiratory tract illness (LRI) in infants and children worldwide and causes significant LRI in the elderly and in immunocompromised patients. The goal of RSV vaccination is to prevent serious RSV-associated LRI. There are several obstacles to the development of successful RSV vaccines, including the need to immunize very young infants, who may respond inadequately to vaccination; the existence of two antigenically distinct RSV groups, A and B; and the history of disease enhancement following administration of a formalin-inactivated vaccine. It is likely that more than one type of vaccine will be needed to prevent RSV LRI in the various populations at risk. Although vector delivery systems, synthetic peptide, and immune-stimulating complex vaccines have been evaluated in animal models, only the purified F protein (PFP) subunit vaccines and live attenuated vaccines have been evaluated in recent clinical trials. PFP-2 appears to be a promising vaccine for the elderly and for RSV-seropositive children with underlying pulmonary disease, whereas live cold-passaged (cp), temperature-sensitive (ts) RSV vaccines (denoted cpts vaccines) would most probably be useful in young infants. The availability of cDNA technology should allow further refinement of existing live attenuated cpts candidate vaccines to produce engineered vaccines that are satisfactorily attenuated, immunogenic, and phenotypically stable.*

**Campylobacter upsaliensis: Waiting in the Wings.** Billy Bourke, Voon Loong Chan, and Philip Sherman ..... 440-449

*Summary: Despite strong epidemiological evidence supporting an important role for Campylobacter upsaliensis as a human enteropathogen, it remains relatively unknown in the realm of clinical microbiology. Clinical studies indicate that infection with this organism usually is associated with benign self-limiting diarrhea. However, more serious illnesses, including spontaneous abortion and hemolytic-uremic syndrome, recently have been associated with human infections. Understanding of the virulence properties and molecular biology of C. upsaliensis is beginning to evolve. There is now a pressing need for controlled, prospective epidemiologic studies in addition to further in-depth investigation of the pathogenesis of this enteric campylobacter to more precisely define its role in human disease. Furthermore, since C. upsaliensis is sensitive to the antibiotics routinely used in Campylobacter selective media, widespread appreciation of the importance of this organism will rely on the development of widely applicable, effective techniques for its isolation.*

**Pathogenesis and Diagnosis of Shiga Toxin-Producing Escherichia coli Infections.** James C. Paton and Adrienne W. Paton..... 450-479

*Summary: Since their initial recognition 20 years ago, Shiga toxin-producing Escherichia coli (STEC) strains have emerged as an important cause of serious human gastrointestinal disease, which may result in life-threatening complications such as hemolytic-uremic syndrome. Food-borne outbreaks of STEC disease appear to be increasing and, when mass-produced and mass-distributed foods are concerned, can involve large numbers of people. Development of therapeutic and preventative strategies to combat STEC disease requires a thorough understanding of the mechanisms by which STEC organisms colonize the human intestinal tract and cause local and systemic pathological changes. While our knowledge remains incomplete, recent studies have improved our understanding of these processes, particularly the complex interaction between Shiga toxins and host cells, which is central to the pathogenesis of STEC disease. In addition, several putative accessory virulence factors have been identified and partly characterized. The capacity to limit the scale and severity of STEC disease is also dependent upon rapid and sensitive diagnostic procedures for analysis of human samples and suspect vehicles. The increased application of advanced molecular technologies in clinical laboratories has significantly improved our capacity to diagnose STEC infection early in the course of disease and to detect low levels of environmental contamination. This, in turn, has created a potential window of opportunity for future therapeutic intervention.*

Continued on following page



**Dengue and Dengue Hemorrhagic Fever.** Duane J. Gubler. . . . . 480–496

*Summary: Dengue fever, a very old disease, has reemerged in the past 20 years with an expanded geographic distribution of both the viruses and the mosquito vectors, increased epidemic activity, the development of hyperendemicity (the cocirculation of multiple serotypes), and the emergence of dengue hemorrhagic fever in new geographic regions. In 1998 this mosquito-borne disease is the most important tropical infectious disease after malaria, with an estimated 100 million cases of dengue fever, 500,000 cases of dengue hemorrhagic fever, and 25,000 deaths annually. The reasons for this resurgence and emergence of dengue hemorrhagic fever in the waning years of the 20th century are complex and not fully understood, but demographic, societal, and public health infrastructure changes in the past 30 years have contributed greatly. This paper reviews the changing epidemiology of dengue and dengue hemorrhagic fever by geographic region, the natural history and transmission cycles, clinical diagnosis of both dengue fever and dengue hemorrhagic fever, serologic and virologic laboratory diagnoses, pathogenesis, surveillance, prevention, and control. A major challenge for public health officials in all tropical areas of the world is to develop and implement sustainable prevention and control programs that will reverse the trend of emergent dengue hemorrhagic fever.*

**Epidemiology of Group B Streptococcal Disease in the United States: Shifting Paradigms.** Anne Schuchat. . . . . 497–513

*Summary: Since its emergence 25 years ago, group B streptococcus has become recognized as a cause of serious illness in newborns, pregnant women, and adults with chronic medical conditions. Heavy colonization of the genital tract with group B streptococcus also increases the risk that a woman will deliver a preterm low-birthweight infant. Early-onset infections (occurring at <7 days of age) are associated with much lower fatality than when they were first described, and their incidence is finally decreasing as the use of preventive antibiotics during childbirth increases among women at risk. New serotypes of group B streptococcus have emerged as important pathogens in adults and newborns. Clinical and laboratory practices—in obstetrics, pediatrics, and clinical microbiology—have an impact on disease and/or its prevention, and protocols established at the institutional level appear to be critical tools for the reduction of perinatal disease due to group B streptococcus. Since intrapartum antibiotics will prevent at best only a portion of the full burden of group B streptococcal disease, critical developments in vaccine evaluation, including study of polysaccharide-protein conjugate vaccines, offer the potential for enhanced prevention in the relatively near future.*

**Serum Therapy for Tuberculosis Revisited: Reappraisal of the Role of Antibody-Mediated Immunity against *Mycobacterium tuberculosis*.** Aharon Glatman-Freedman and Arturo Casadevall. . . . . 514–532

*Summary: Fifty years after the introduction of the first effective antimicrobial agents against Mycobacterium tuberculosis, this pathogen continues to be a tremendous public health problem. The rise in the number of resistant strains and the difficulties involved in the therapy of tuberculosis in immunocompromised AIDS patients have renewed the interest in the development of effective vaccines. To evaluate whether a potential vaccine against tuberculosis could prevent infection by eliciting a protective antibody response, we reviewed the history of antibody-mediated immunity against tuberculosis. Review of the literature of the past 100 years demonstrates that there is sufficient evidence to conclude that antibody-mediated immunity can modify the course of infection in certain situations. Based on our findings and on what is known in other systems, we propose that the role of antibody-mediated immunity to M. tuberculosis be reexamined, using advanced technology.*

**Quantitation of Cytomegalovirus: Methodologic Aspects and Clinical Applications.** Michael Boeckh and Guy Boivin. . . . . 533–554

*Summary: Cytomegalovirus (CMV) is an important pathogen in transplant recipients and human immunodeficiency virus (HIV)-infected individuals. Major progress has been made in developing quantitative detection methods for CMV in recent years. Due to their high sensitivity,*

Continued on following page

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.