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An integrated approach to the understanding of *Chlamydia trachomatis* infection



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PREFACE

Chlamydia trachomatis infection is the most common bacterial sexually transmitted disease with 89 million new cases worldwide each year. An integrated, multidisciplinary effort is needed to achieve a greater understanding of the immunopathogenesis of *C. trachomatis* in order to combat this infection, prevent the long-term complications which occur in a subgroup of patients, and to develop a vaccine. This vision was presented in Amsterdam in December 2004 at an international mini-symposium which inspired the publication of this supplement.

The articles herein provide a comprehensive overview of *C. trachomatis* infection in the clinical setting, in basic research and in animal models, and involve investigations in Europe, the United States and Central America. An integrated approach to experimental and clinical research in *C. trachomatis* infections is summarized by Dr. Joseph M. Lyons from the Department of Infectious Diseases, City of Hope (COH) Medical Center, Duarte, California. The Emeritus Professor Michael E. Ward from the Department of Medical Microbiology, Southampton University, UK, with his years of experience in the field and his web site www.chlamydiae.com, has provided the Introduction.

The first chapters present the extensive Dutch experience with *C. trachomatis*, which has been a great contribution to our overall understanding of this infection. Morré *et al.*, provide an overview of research performed on urogenital *C. trachomatis* infections based on past and current PhD fellows, publications by Dutch authors and the results of main discussion forums.

In the clinical setting, van Bergen *et al.* describe the findings from a large population-

based *C. trachomatis* screening trial involving 21,000 participants, in which they studied the prevalence and risk profile for *C. trachomatis* in both rural and urban areas in the Netherlands. Land *et al.* investigate the relationship between *C. trachomatis* antibodies and tubal pathology. Women with persistent chlamydia infections are considered to be at the highest risk for developing late sequelae. The predictive value of different serological markers were studied to determine which had the highest positive predictive value to identify women with tubal pathology. Dr. Perenboom describes lymphogranuloma venereum (LGV) infections in general and a recent LGV outbreak caused by *C. trachomatis* serovar L2 among HIV-positive men in the Netherlands and Belgium. This observation is particularly important in the differential diagnosis of proctitis in homosexual men. Gorter *et al.* discuss *C. trachomatis* in Nicaragua, illustrating the high prevalence of this infection in developing countries. The screening programme described is based on a donor-supported competitive voucher scheme providing prevention and treatment services for sexually transmitted infections and HIV/AIDS to high-risk populations such as sex workers and their partners and clients.

In the basic chlamydial research area, Vanrompay *et al.* review the two major animal models for the study of *C. trachomatis* female genital tract infections, the primate model and the mouse model. A potential new model is discussed, the pig model, developed by Dr. Vanrompay. Dr. Pannekoek and Dr. van der Ende describe how *Chlamydiae* might modify the inclusion membrane through the insertion of chlamydial-derived components. Their review focuses on the structural and functional

aspects of inclusion proteins of *Chlamydiae* and summarizes data obtained in *in vitro* studies and comparative genomics. Dr. Severin and Dr. Ossewaarde review the role of innate immunity in defense against *C. trachomatis* infection. In addition, recent findings regarding a differential response to invasive and noninvasive chlamydial infections are highlighted.

The final section includes an overview of decades of research performed in Duarte, California. In a summary of his thesis, Joseph M. Lyons focuses on the immunogenetics of *C. trachomatis* infections and provides preliminary results of studies on host factors and the use of the knockout mouse as an experimental model. The human candidate gene approach to genes that control the inflammatory reaction, such as interferon, as well as those involved in antigen presentation, such as Toll-like receptors, provides the basis for studies presented in his thesis on bacterial factors, prophylactic intervention, acquired and innate immunity. The value of innate immunity in this infection is a new area of interest and a review on current knowledge on Toll receptors is provided by Dr. Mihai G. Netea.

Finally, to further the multidisciplinary effort expressed in the supplement, a consor-

tium to promote new research is presented. The "ICTI consortium" is described by Morré *et al.* and provides a model of multidisciplinary and multicenter collaboration to stimulate international research.

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The Laboratory of Immunogenetics is part of the Department of Pathology (Head Prof. Chris J.L.M. Meijer) since February 1, 2005. The inclusion of immunogenetics and other groups working in a translational and multidisciplinary research environment promises to be a well-deserved platform stemming from the 12 years of experience constructing the basis for this discipline at the VUmc of Amsterdam in close collaboration with J. Bart A. Crusius, PhD. We hope that the insight generated in disease immunopathogenesis will lead to the development of new strategies to improve diagnostic and prognostic tests.

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