Title: Rickettsia and other intracellular bacteria: recent outbreaks, novel pathogens, emerging diseases, new tools, and outstanding discoveries.

Authors: Greub G, Gikas A, Heinzen RA, Dumler JS

Journal: FEMS immunology and medical microbiology

Year: 2012 Feb

Volume: 64

Issue: 1

Pages: 1-2

DOI: 10.1111/j.1574-695X.2011.00915.x

Rickettsia and other intracellular bacteria: recent outbreaks, novel pathogens, emerging diseases, new tools and outstanding discoveries

During the 6th International Meeting on *Rickettsia* and rickettsial diseases, that was held in Heraklion (Greece) from 5 to 7th June 2011, a large number of important recent discoveries were presented, some of which are available in this thematic issue as original articles. These included significant contributions to the understanding of the pathogenesis, epidemiology, diagnosis and clinical presentation of rickettsial diseases as well as human and animal infections by various other intracellular bacteria, such as *Anaplasma*, *Bartonella*, *Coxiella*, *Ehrlichia*, *Waddlia* and *Wolbachia.*

Most of these bacteria are strict intracellular bacteria that are particularly difficult to study, owing to their dependence to the host cell and to the lack of straightforward systems to manipulate their genomes. Rather than slowing down research, these difficulties have, however, stimulated innovation and forced researchers to use new strategies to decipher the biology of these fastidious microorganisms. Thus, the meeting was an ideal opportunity for younger scientists to become familiar with modern cell biology, advanced molecular biology and various "'omics" approaches. In addition to genomics, transcriptomics and proteomics studies, "culturomics" was also preeminent, since *in vitro* culture remains the essential first step to get a strain available for any downstream applications. The number of new discoveries is witness to the dynamics of research in rickettsiology and also partially reflects the fact that the meeting is only held once per 3-year period. When shared in such an international meeting, these discoveries benefit the whole community by increasing our understanding of the pathogenesis of rickettsial diseases and by providing the prerequisite knowledge to identify the biological basis of poor outcomes, as nicely demonstrated by J.S Dumler in the 1st review article of the thematic issue (1), focused on *Anaplasma phagocytophilum*.

In addition to cutting edge technologies and outstanding discoveries in basic research, recent outbreaks have been analyzed in depth, providing clues on transmission, attack rates and associated morbidity. As an example, the recent 2007-2010 Q fever outbreak that took place in the Netherlands highlights the importance of preventive measures, active surveillance, and coordinated efforts between the environmental protection agencies, the human public health offices, the veterinary authorities, the clinical microbiologists and the infectious diseases specialists, as discussed by F. Dijkstra (2). This outbreak, the largest recent European epidemic, also shed some light on the pathogenesis of *C. burnetii*-associated miscarriage, which does occur only with some strains and indeed not with the Dutch isolate. The importance of ticks in the transmission and geographical repartition was also an important topic of discussion during the meeting.

Thanks to the skills in cell culture of scientists in the field, research on novel bacteria, symbionts and emerging pathogens represented another strength of the meeting. Although rarely considered to be pathogenic, symbionts of nematodes, ticks and amoebae also represented an intense area of research at the meeting, which is summarized in the review article written by M. Taylor *et al.* in the 3rd article of the thematic issue (3).

Overall, the 6th International Meeting on *Rickettsia* and Rickettsial diseases, co-organized by the American Society of Rickettsiology and the ESCMID Study group on *Coxiella, Anaplasma, Rickettsia* and other related fastidious micro-organisms (ESCAR), was very successful and involved many fruitful scientific exchanges, stimulated by the exceptional location of the congress on the beautiful island of Crete (Greece), immediately along the coast of the Mediterranean sea. With this thematic issue on rickettsial infections, you will be able to recap major advances in the field and hopefully will be eager to attend the 7th International Meeting on *Rickettsia* and Rickettsial diseases, which will take place in June 2014.

G. Greub, A. Gikas, R. Heinzen and JS Dumler
Guest editors

References.

1. Dumler, J. Stephen. The biological basis of severe outcomes in *Anaplasma phagocytophilum* infection. FEMSIM-11-10-0299
2. Taylor, Mark; Mediannikov, Oleg; Raoult, Didier; Greub, Gilbert. Endosymbiotic bacteria associated with nematodes, ticks and amoebae. FEMSIM-11
3. Dijkstra, Frederika; van der Hoek, Wim; Wijers, Nancy; Schimmer, Barbara; Rietveld, Ariene; Wijkmans, Clementine; Vellema, Piet; Schneeberger, Peter. The 2007-2010 Q fever epidemic in the Netherlands: characteristics of notified acute Q fever patients and the association with dairy goat farming. FEMSIM-11-06-0124.R1