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Editorial

Molecular markers of infectious diseases

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The development of effective strategies for the assessment and control of infectious diseases requires a better understanding of pathogen biology, host immune response, and diseases pathogenesis as well as the identification of the associated biomarkers. Therefore, characterizing and identifying host and pathogen determinants of protection or progression to disease in exposed subjects are the necessary first steps toward disease control. This special issue brings together a body of critical information on selected diseases and provides a peek into infectious diseases markers. Through five reviews, focusing on pathogen factors, host genetic and immunological determinants that lead to protection or disease progression, the authors emphasize the essential role of biomarkers in the design of new effective therapies and vaccines. Also discussed in this issue are the premises of molecular epidemiology studies of infectious diseases.

The first review (Beatriz Mothe and colleagues) discusses virological, immune and host genetic markers in the control of HIV-infection. The authors highlight the need to define precise immune correlates of controlled HIV infection for the early assessment of vaccine success in phase I and phase II trials. Also discussed is the identification of host genetic markers that in the future could facilitate the design of gene therapy approaches by either blocking the expression of unfavourable genes or by introducing beneficial components.

Mariangela Cavarelli and Gabriella Scarlatti review phenotype variations in human immunodeficiency virus type 1 infection and progression to disease in both adults and children. The authors give an insight into the intrinsic variability of HIV-1 and their implication in not only disease progression, but also in mother-to-child transmission. Furthermore, they underline the importance role of HIV-1 phenotyping in HIV drug and vaccine development.

In their review, Mascellino and colleagues examine virulence determinants in *Helicobacter pylori* (*Hp*) strains and their pathogenesis. The authors also discuss host responses to *Hp* as well as the implications and advantages of the developing non-invasive pre-endoscopy screening of molecular and serological markers of *Hp* virulence and disease progression.

Maria Thunø, Betina Macho and Jesper Eugen-Olsen's review explores the potential of the soluble urokinase plasminogen activator receptor (suPAR) as a general marker of disease progression, prognosis and mortality. The review not only provides biochemical background, molecular mechanism and function of suPAR's during inflammation and infection, but also highlights its possible medical applications through a recollection of several studies.

The fact that some but not all people exposed to an infectious agent develop disease has lead to believe that some population might be more susceptible to disease than others. Therefore, molecular epidemiology studies for a number of infectious diseases have been carried out in order to identify genes involved in individual susceptibility. In this special issue, using leprosy and tuberculosis as models, Antonio Pacheco and Milton Moraes discuss the basic concepts of molecular epidemiology and review every step that should be followed to design, conduct, analyze, interpret and present molecular epidemiologic studies. Taken together, we believe that this special issue gives a good overview of the contemporary area of biomarkers in infectious diseases.

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