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EDITORIAL

In this issue: Innate immunity and infectious diseases–An update

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Initial microbial sensing and activation of appropriate defense mechanisms is the cornerstone to the immune response to microbial challenges. The spatiotemporal expression of a germline-encoded family of sensors ensures accurate sensing and complete responses against a broad range of microbes with minimal alteration of the host hemostasis. This special issue of the *International Reviews of Immunology* is dedicated to innate immune sensors, the regulation of sensor-mediated signaling pathway in infectious and non-infectious diseases, and the possibilities to exploit this knowledge for development of therapeutics.

Pathogen recognition is primarily mediated through several families of receptors such as Toll-like receptors (TLRs), C-type lectin receptors (CLRs), RIG-I-like receptors (RLRs), DNA-sensors, and NOD-like receptors (NLRs), expressed within various compartments of the immune and non-immune cells. In the first review article, Tartey et al., discuss various pathogen-associated molecular patterns (PAMPs) and danger-associated molecular patterns (DAMPs) sensed by TLRs and the outcome of sensing through cross-talk among different signaling pathways during infectious disease. Moreover, the authors also discuss the role of TLRs in non-infectious disease such as autoimmune diseases and cancer, and the potential therapeutic targets associated with TLR signaling pathways, applicable to treating various diseases (Fig. 1).

The second review article, by Ori et al., focuses on intracellular sensing of DNA and RNA molecules derived from microbial or host origin, and the signaling cascade leading to the production of type I Interferons and inflammatory cytokines. The article also discusses the deregulation of immune sensors and signaling molecules, and development of autoimmune disease. The article showcases the role of innate immunity in autoimmune disease, potentially useful for development of innate immune based-therapeutics (Fig. 1).

Viruses with pandemic potential are always a serious threat to humans. The third review article, by Mishra et al., describes the pathogenic potential of avian influenza viruses in an array of hosts comprising birds and humans. The article also highlights the possible links between differential immune responses to flu and disease outcome. The review describes limitations associated with various avian flu studies and suggested system biology approaches to aid in the development of new therapeutics for controlling future flu pandemics (Fig. 1).

The last review article of this issue, by Enchéry et al., discusses emerging or re-emerging Hendra and Nipah viruses which are highly pathogenic and lethal to humans. These viruses can infect both animals and humans; however, some animals, particularly the bats, which are also considered as a natural reservoir hosts, remain asymptomatic. These observations are challenging the scientific community particularly the immunologists, virologists and microbiologists to dissect underline molecular mechanisms for the development of novel therapeutics which may not only be effective against these viruses but could also be useful against several similar RNA viruses (Fig. 1).

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Color versions of one ormore of the figures in the article can be found online at www.tandfonline.com/iiri.

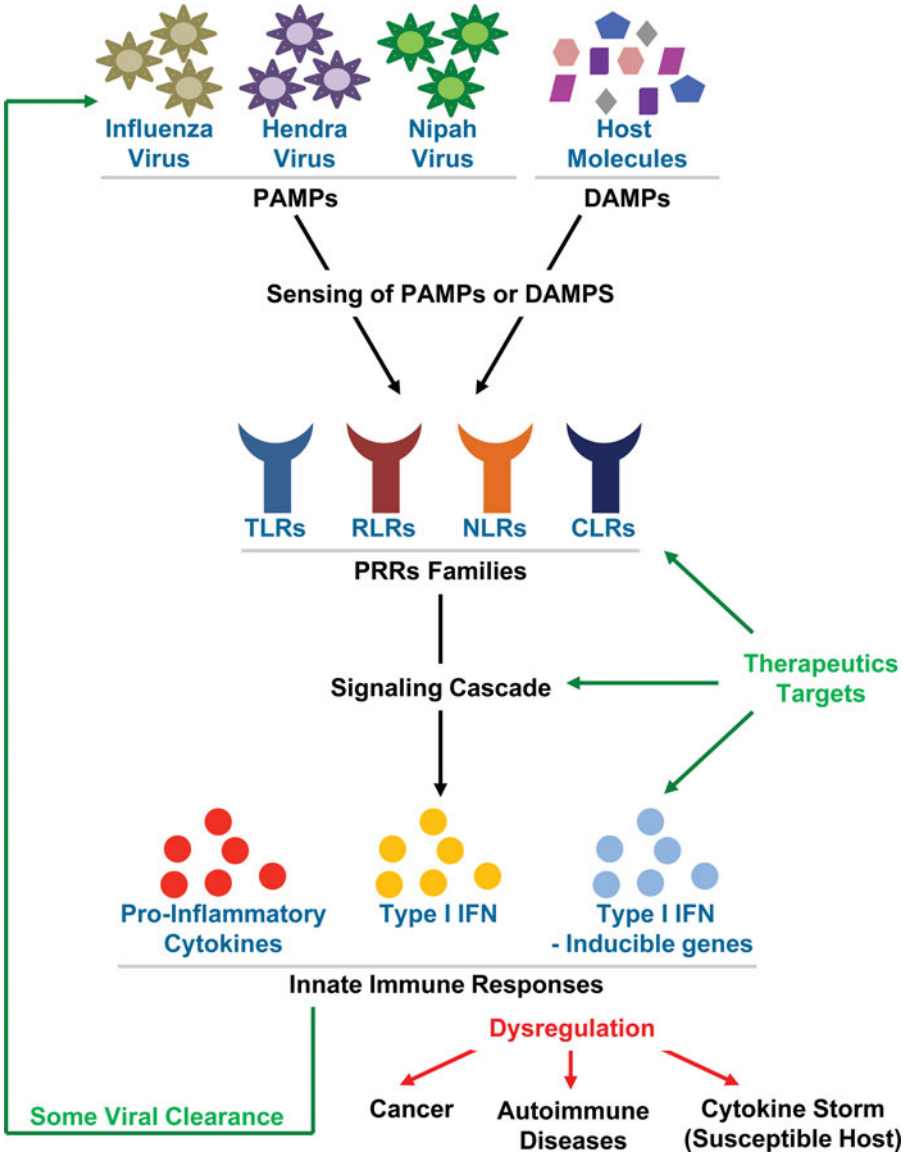

Figure 1. Role of Innate Immunity in Infectious and non-infectious disease. PAMPs, Pathogen-associated molecular patterns; DAMPs, Danger-associated molecular patterns; TLRs, Toll-like receptors; RLRs, RIG-I-like receptors; NLRs, NOD-like receptors, CLRs, C-type lectin receptors and Type I IFN, Type I interferons.

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