Abstract
Among the numerous purported health benefits attributed to probiotic bacteria, their capacity to interact with the immune system of the host is now supported by an increasing number of in vitro and in vivo experiments. In addition to these, a few well-controlled human intervention trials aimed at preventing chronic immune dysregulation have been reported. Even though the precise molecular mechanisms governing the cross-talk between these beneficial bacteria and the intestinal ecosystem remain to be discovered, a new and fascinating phase of research has been initiated in this area as demonstrated by a series of recent articles. This article summarizes the status and latest progress of the field in selected areas and aims at identifying key questions that remain to be addressed, especially concerning the translocation of ingested bacteria, the identification of major immunomodulatory compounds of probiotics, and specific aspects of the host-microbe cross-talk. The interaction with immunocompetent cells and the role of secretory IgA in gut homeostasis are also evoked. Finally, a brief overview is provided on the potential use of recombinant DNA technology to enhance the health benefits of probiotic strains and to unravel specific mechanisms of the host-microbe interaction.