New Approaches to Development of Mucosal Vaccine against Enteric Bacterial Pathogens; Preventing Campylobacteriosis

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Although vaccination, after having been more than 200 years in medical practice, has proven to be the most effective and the cheapest way to prevent infectious diseases, they remain still the main cause of human premature deaths. As many pathogens enter the human body through the mucosal surfaces, the mucosal way of immunization is considered to be the most promising strategy to decrease the number of human infections. Moreover, the oral delivery system eliminates the necessity of injection what is extremely important for pediatric immunization programs. However, most of recently constructed subunit vaccines based on purified bacterial/viral antigens are rather poorly immunogenic. This review presents some novel ways to enhance and modulate host immune responses by combining antigens with specific adjuvants or by employing specific delivery systems. We also discuss some recent technologies, based on mining the genomic sequences of bacterial pathogens, which accelerate and improve identification of new candidates for vaccine construction. As an example, we focus on the progress in the development of vaccine against Campylobacter spp. Campylobacter jejuni is now recognized as a leading cause of bacterial enteritis in human.