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Immunization with *Salmonella* PrgI and SipD type III secretion proteins protects mice against intestinal infection by *Salmonella typhimurium*

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Salmonella enterica species are food and water-borne pathogens that cause severe diseases ranging from self-limiting gastroenteritis to typhoid fever in both humans and animals. These infectious diseases are still the major cause of morbidity and mortality in the developing world, especially for children younger than 5 years. The existence of multiple *Salmonella* serotypes as well as emerging antibiotic resistance requires the development of a protective vaccine. All *Salmonella* spp. utilize a type III secretion system (T3SS) to initiate infection. Part of the T3SS forms an extracellular needle and syringe necessary to inject effector proteins in the host cell, subverting normal cellular functions and causing enteric infections. PrgI and SipD that form the T3SS needle and a tip complex at the top of the T3SS needle, respectively, are required for pathogenesis. Because they are common to all virulent *Salmonella* spp., they are ideal candidate antigens for a subunit-based, broad-spectrum vaccine. In this study, we investigated the immunogenicity and protective efficacy of PrgI and SipD administered by subcutaneous, intranasal and oral route, alone or combined, in a mouse model of intestinal challenge. Robust IgG antibodies responses were induced against both proteins, particularly SipD, in all immunization routes. Furthermore, mucosal IgA antibodies were induced after oral immunization. These responses, however, were lower than those obtained after intranasal immunization. Mice immunized with SipD alone or SipD combined with PrgI were partially protected against lethal intestinal infection with *Salmonella typhimurium*. We provide the demonstration that the *Salmonella* T3SSs PrgI and SipD are promising antigens for the development of a protective *Salmonella vaccine*.

Biography

Bakhos Jneid is a PhD student in Microbiology and Anti-Infective Therapeutics at the University of Paris Saclay (Paris 11). He works in the Immuno-analyze Research Group, under the supervision of Dr. Stéphanie SIMON, in the Atomic Energy and Alternative Energies Commission of Saclay or CEA. He received his Master's degree in Immunology-Microbiology-Infectiology IMI from the University of Joseph Fourier-Grenoble, France in 2013. His current work focuses on the study of the immunogenicity and effectiveness of candidate antigens for a subunit-based, broad-spectrum vaccine against enteric pathogens.

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