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A newly developed scrub typhus vaccine candidate: The DNA plasmid carrying the truncated gene of hTRA can protect mice against the homologous challenge of orientia tsutsugamushi

Wei-Mei Ching
Naval Medical Research Center, USA

Scrub typhus is an acute, febrile disease caused by infection of Orientia tsutsugamushi.

It accounts for more than 20% of all febrile episodes in endemic areas of the Asia-Pacific region. Recent documents have shown the presence of scrub typhus in Middle East and South America. The major challenge in scrub typhus vaccine development is how to formulate a vaccine which can provide a prolonged broad protection. Previously we have shown that the plasmid carrying the conserved gene of 47 kDa antigen provided very good homologous protection and some heterologous protection in a lethal mouse model. However this 47 kDa antigen belongs to the family of HtrA and exhibits a very high sequence homology with human protease HtrA1 (46% identical, 70% semi-conserved, and 81% similar) in its central portion (aa 85-235). To avoid the concern of autoimmune responses for this vaccine candidate, we have successfully cloned a truncated fragment E (coding aa 236-477) into the vector VR1012 (pKp47E). This plasmid was evaluated for protective efficacy in both outbred and inbred mouse challenge model. Mice were immunized twice at four weeks interval and challenged at four weeks after the last immunization. The morbidity and mortality were monitored daily for 21 days post challenge. Close to 80% of the immunized mice were protected against the lethal challenge. The results demonstrated that a safe vaccine candidate, pKp47 E, without any possibility of inducing auto immune responses, can provide excellent protection against the homologous challenge similar to that of the full length 47 kDa antigen.

Biography

Wei-Mei Ching completed her Ph. D. from University of Pennsylvania in 1977 and continued her training as a postdoctoral fellow at the National Institutes of Health. She joined Naval Medical Research Center in 1986. Currently she is a Senior Scientist at Viral and Rickettsial Diseases Department, Infectious diseases Directorate. She has published more than 70 papers, holds 16 US patents and serving as a member of different steering committees within Military Infectious Diseases Research Program and the contracting officer representative for various Army contracts in the biomedical field.

WeiMei.Ching@med.navy.mil