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Using NYVAC vectors as vaccine candidates for *Leishmaniasis*

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Heterologous vaccination based on priming with a plasmid DNA vector and boosting with an attenuated Vaccinia virus expressing *Leishmania infantum* LACK antigen has shown efficacy conferring protection in murine and canine models against cutaneous and visceral leishmaniasis. Until now, MVA, M65 and M101 are the only attenuated Vaccinia virus strains described as vaccine vectors against this disease. Here, we analyzed in mouse model the immune response elicited and the protection induced by NYVAC strains of Vaccinia virus expressing LACK antigen. NYVAC-LACK and a replication competent NYVAC expressing C7L host range gene (NYVAC-LACK-C7L) induced high quality $CD4^+$ and $CD8^+$ adaptive and effector memory T cell responses against LACK antigen. These $CD8^+$ T cell populations also showed an excellent proliferative capacity when stimulated with LACK antigen. Differences between the NYVAC viruses and with the MVA strain were restricted to magnitude of the elicited response. After subcutaneous *L. major* challenge, mice vaccinated with NYVAC-LACK-C7L showed similar reduction in lesion size as those vaccinated with MVA-LACK strain. Our findings suggest that both NYVAC-LACK and NYVAC-LACK-C7L meet the criteria to be potential vaccine candidates against leishmaniasis.

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