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Vaccination with an adenoviral vector expressing calreticulin human papillomavirus 16 E7 fusion protein eradicates E7 expressing established tumors in mice

Jorge G. Gomez-Gutierrez
University of Louisville School of Medicine, USA

Background: Cervical cancer remains a leading cause of cancer-related mortality in women, particularly in developing countries. The causal association between genital human papillomavirus (HPV) infection and cervical cancer has been firmly established, and the oncogenic potential of certain HPV types has been clearly demonstrated. Vaccines targeting the oncogenic proteins E6 and E7 of HPV-16 and -18 are the focus of current vaccine development. Previous studies have shown that calreticulin (CRT) enhances the MHC class I presentation of linked peptide/protein and may serve as an effective vaccination strategy for antigen-specific cancer treatment.

Methods: Two replication-deficient adenoviruses, one expressing HPV-16 E7 (Ad-E7) and the other expressing CRT linked to E7 (Ad-CRT/E7), were assessed for their ability to induce cellular immune response and tested for prophylactic and therapeutic effects in an E7-expressing mouse tumor model.

Results: Vaccination with Ad-CRT/E7 led to a dramatic increase in E7-specific T cell proliferation, interferon (INF)-γ-secretion, and cytotoxic activity. Immunization of mice with Ad-CRT/E7 was effective in preventing E7-expressing tumor growth, as well as eradicating established tumors with long-term immunological memory.

Conclusion: Vaccination with an adenoviral vector expressing CRT-E7 fusion protein represents an effective strategy for immunotherapy of cervical cancer in rodents, with possible therapeutic potential in clinical settings.

Biography

Jorge G. Gomez-Gutierrez has completed his Ph.D. at the age of 30 years from Autonomous University of Nuevo Leon, Mexico and postdoctoral studies from University of Louisville School of Medicine. He is an Assistant Professor in the Department of Surgery, Division of Surgical Oncology at UofL. He has published 13 papers and has received several awards in Mexico and USA.

jgguti01@louisville.edu