

## High immunogenic activity of GX301, a telomerase-based, multi-peptide, multi-adjuvant cancer vaccine

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Vaccination against cancer is a new frontier of oncological treatment but issues related to the weak immunogenicity of tumor antigens hamper its efficacy. In particular, peptide vaccines, although safe, have problems related to HLA restriction and rapid clearance. To overcome these issues, we set a telomerase-based vaccine constituted by four different peptides and two adjuvants. The peptides are promiscuous and able to bind to both HLA class I and class II molecules. The adjuvants, Montanide ISA-51 and Imiquimod, induce efficient innate immune responses strongly activating antigen presenting cells. Moreover, Montanide produces a water-in-oil emulsion with the peptide solution that protects against protease clearance and favors uptake by phagocytes. Overall, this new vaccine is theoretically able to induce telomerase-specific immune responses encompassing the physiological route of immune activation involving both innate and adoptive circuits as well as both Th and CTL lymphocytes. Safety and efficacy of GX301 were tested in a phase I/II clinical trial enrolling stage IV prostate and renal cancer patients resistant to conventional therapies. No grade 3-4 adverse effects were observed. Importantly, 100% of patients showed evidences of efficient immunization against telomerase. Although performed in a very advanced cancer patient population, clinical evaluation showed disease stabilization in 4 cases, as well as prolonged overall survival and progression free survival in patients (8/14) showing a full pattern of vaccine-specific immunological responses. In conclusion, the adoption of a multi-peptide, multi-adjuvant strategy seems to be effective in inducing efficient immune responses against potentially weak immunogenic antigens such as self-tumor antigens.

### Biography

Dott. Filaci has a degree in Medicine and a PhD in Experimental Hematology. He is Associate Professor of Internal Medicine at the University of Genoa, Italy. He is the director of the Clinical and Experimental Immunology Operative Unit of the Centre of Excellence for Biomedical Research. He has published more than 65 papers in peer-reviewed journals. He is member of CIS and FOCIS, and served as reviewer for several international journals.

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