Titolo:	Anti-ERBB2 DNA vaccine hampers chemical carcinogenesis
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Abstract:	The exposure to chemical mutagens, as pollutants and polycyclic aromatic hydrocarbons, is responsible for a substantial percentage of cancer occurrences worldwide. Many of these have worse outcome due to the impossibility to impair the initial stages of the neoplastic transformation. Triggering a response against cancer progression-related molecules, anti-oncoantigens vaccines have been highly effective for the prevention of genetically-promoted tumor occurrences; nevertheless, their ability against the chemical carcinogenesis is still mostly unexplored. In order to fill this gap we have induced an oral DMBA-driven multistep chemical carcinogenesis in the random-bred Syrian hamster model. Occurring lesions were characterized by a transient overexpression of the membrane tyrosine kinase receptor ERBB2 within the preneoplastic stage. Subsequently, repeated vaccinations with DNA plasmids encoding for the extracellular and transmembrane domains (EC-TM) of ERBB2 were performed before and throughout the chemical induction. Preneoplastic lesion occurrences were delayed and multiplicity reduced if compared to the control hamsters. Also incidence, number, and size of exophytic lesions were reduced, inasmuch as ~15% of EC-TM-immunized hamsters remained lesions-free until the end of the experimentation. The pathologic stage of exophytic occurrences from vaccinated hamsters were mainly papillomas and in-situ carcinomas, while control specimens were predominantly invasive carcinomas. The elicited protection was heterogenic among EC-TM hamsters, but proportional to the intensity of anti-ERBB2 antibody response induced by the vaccine. These results support the prospects of vaccines as a fresh strategy in the management of individuals at risk for exposure to defined carcinogenic agents.

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