Breadth of T cell responses after immunization with adenovirus vectors encoding ancestral antigens or polyvalent papillomavirus antigens

Oncogenic human papillomaviruses (HPVs) are in most cases eliminated by intervention of T cells. As many other pathogens, these oncogenic HPVs belong to an ancient and diverse virus family. Therefore, we found it relevant to investigate the potential and limitations of inducing a broad response - either by inducing cross-reactive T cells or by administering a polyvalent vaccine. To test these strategies, we designed 3 ancestral and 2 circulating sequences based on the two domains of the E1 and E2 proteins of papillomaviruses (PVs) that exhibit the highest degree of conservation in comparison to the other PV proteins. The PV sequences were fused to a T cell adjuvant, the murine invariant chain and encoded in a recombinant adenoviral vector which was administered to naive outbred mice. By measuring T cell responses induced by these different vaccines and towards peptide pools representing 3 circulating strains and a putative ancestor of oncogenic HPVs, we showed that the ancestral vaccine antigen has to be approximately 90% identical to the circulating PVs before a marked drop of ~90% mean CD8+ T cell responses ensues. Interestingly, the combination of two or three type-specific PV vaccines did not induce a significant decrease of the CD8+ T cell response to the individual targeted PV types. Polyvalent HPV vaccine based on the E1 and E2 proteins seem to be capable of triggering responses towards more than one type of PV while the cross-reactivity of ancestral vaccine seems insufficient in consideration of the sequence diversity between HPV types.
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 1  
Scopus rating (2011): CiteScore 2.06 SJR 0.865 SNIP 0.654  
Web of Science (2011): Impact factor 2.23  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 1  
Scopus rating (2010): SJR 0.859 SNIP 0.621  
Web of Science (2010): Impact factor 1.935  
BFI (2009): BFI-level 1  
Scopus rating (2009): SJR 0.973 SNIP 0.659  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 1  
Scopus rating (2008): SJR 0.24 SNIP 0.078  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 0.288 SNIP 0.141  
Scopus rating (2006): SJR 0.426 SNIP 0.124  
Scopus rating (2005): SJR 1.017 SNIP 0.641  
Web of Science (2005): Indexed yes  
Scopus rating (2004): SJR 0.858 SNIP 0.6  
Web of Science (2004): Indexed yes  
Scopus rating (2003): SJR 0.819 SNIP 0.625  
Scopus rating (2002): SJR 0.74 SNIP 0.587  
Web of Science (2002): Indexed yes  
Scopus rating (2001): SJR 0.746 SNIP 0.63  
Scopus rating (2000): SJR 0.876 SNIP 0.608  
Web of Science (2000): Indexed yes  
Scopus rating (1999): SJR 0.846 SNIP 0.651  
Original language: English  
Electronic versions:  
sji12522.pdf_jsessionid_42EE64BE2D238FDF1A7EEFA7A9E00A4D.f04t01.pdf. Embargo ended: 28/02/2018  
DOIs:  
10.1111/sji.12522  
Source: FindIt  
Source-ID: 2351358094  
Research output: Research - peer-review > Journal article – Annual report year: 2017