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# Development of new prostate cancer vaccine strategies using p53 as target antigen

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Prostate cancer is the most prevalent cancer in men. In 2009, 40,841 men were diagnosed with prostate cancer and 10,382 men actually died from it in the UK alone. Cancer immunotherapy aims at producing a long lasting and potent tumour-specific immune response by targeting antigens that are over-expressed by tumour cells. Furthermore, prostate cancer develops slowly and this could be used to the advantage of clinicians by giving them more opportunities to vaccinate the patients.

The aim of this project is to develop new prostate cancer vaccination strategy using the tumour antigen p53 as a target. p53 has been found to be over-expressed in 72% of primary prostate carcinomas and its accumulation within the tumour cells is associated with over-presentation of p53-derived peptides on the surface of tumour cells to the immune system via MHC class I molecules. In this project, we used HLA-A2.1 restricted wt p53 peptides to generate CTL in both C57BL/6 mice and HHDII/DR1 double transgenic mice. CTL were generated by immunising the experimental mice with either wt murine or mutated human p53 cDNA and a panel of p53 class I and class II epitopes was screened for their immunogenicity and their endogenous processing using IFNγ Elispot assay.

The CTL generated were p53 class I-restricted epitope and were able to recognise R-MAS cells pulsed with the same class I epitope. Furthermore, Th cells were generated and proliferated when co-cultured with wt p53 class II epitope-pulsed dendritic cells. These wt p53 class I and class II epitopes will be further assessed using the MC38/ MC38-HHDII and p53-transfected TRAMP/ TRAMP-HHDII cells as targets. After successful assessment, selected epitopes will be used in a prophylactic and therapeutic pre-clinical setting in the view of being used alongside traditional cancer treatments in a clinical setting.

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