Adoptive T cell receptor (TCR) gene transfer of HPV16 HLA-A*0201 Specific TCR to Human T Cells

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A T cell mediated response against the early proteins of HPV may offer considerable therapeutic potential against cervical cancer. Recently, TCR gene transfer has been proposed as a strategy to provide anti-tumor immunity to cancer patients. It has been shown that transferring the TCR genes from tumor reactive T cell clones to peripheral blood lymphocytes can redirect their specificity to recognize the appropriate tumor antigens. Therefore, we have identified and cloned the α and β chains from the TCR of two CTL clones reactive with the HLA-A*0201 restricted epitopes from HPV16 E6 29-38 and E7 11-20. By placing the α and β chains of these TCR into retroviral vectors, we can transfer the specific TCR to human T cell lines and PBL and detect the receptor by staining with TCR specific Vβ subfamily antibodies and HPV16 specific peptide/MHC tetramers. Furthermore, the recipient T cells can elicit peptide specific immune responses as detected by cytokine release and lysis assays. The ability to adoptively transfer genetically engineered tumor reactive T cells to a patient may represent an effective anti- tumor therapy against cervical cancer and this study may help pave the way for clinical evaluation of this treatment strategy.