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Identification of a melanoma-associated chondroitin sulfate proteoglycan (MCSP) peptide recognized by CD4+ T lymphocytes on human melanoma cells

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The identification of tumor antigens recognized by cytolytic CD8+ T cells (CTLs) on human tumor cells has opened new avenues in cancer immunotherapy. There is consensus, that the induction of both, tumor-specific CTLs and CD4+ T helper cells is necessary for an optimal antitumor immunity. Unfortunately, only a few tumor-specific helper T cell epitopes have been described so far. We therefore have focused our research on the identification of melanoma antigens recognized by CD4+ T cells. One interesting candidate antigen is the human melanoma-associated chondroitin sulfate proteoglycan (MCSP), which is expressed on > 90% of human melanoma tissues and induces strong humoral responses in mice. In the present study, we describe the induction of MCSP-specific CD4+ T cell clones from the peripheral blood of a healthy human donor and the subsequent identification of the T cell epitope which is located in the core protein. The identified peptide was presented to the T helper cells by HLA-DR11 molecules, which are expressed by approximately 13% of Caucasians. The T cells directly recognized HLA-matched MCSP-expressing melanoma cells and produced high amounts of IFN-gamma, a cytokine with important antitumoral effects. To the best of our knowledge, this is the first MCSP-derived T cell epitope described and it should be useful for melanoma immunotherapy.