Myeloid-derived suppressor cells impair the quality of dendritic cell vaccines

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Myeloid-derived suppressor cells (MDSC) are important regulators of the immune system and key players in tumor-induced suppression of T-cell responses. CD14+HLA-DR-/low MDSC have been detected in a great number of malignancies, including melanoma. MDSC are known to be impaired in their ability to differentiate along the myeloid lineage, e.g., into dendritic cells (DC). This is a concern for utilization of monocyte-derived DC for vaccination of patients with melanoma or other cancers exhibiting accumulation of CD14+ MDSC. When producing DC according to standard operating procedures of two currently ongoing clinical trials, we found that MDSC co-purified with monocytes isolated by elutriation. MDSC frequencies did not affect yield or viability of the produced DC, but induced a dose-dependent decrease in DC maturation, ability to take up antigen, migrate and induce T-cell IFN? production. Changes in DC characteristics were most notable when 'pathological' frequencies of >50% CD14+HLA-DR-