PD-1 and PD-L1 expression on PBMC subsets in normal individuals and cancer patients

Lauren Lepone1*, Renee N Donahue1, Italia Grenga1, James L Gulley2, Christopher R Heery1, Ravi A Madan3, Jeffrey Schlom1, Benedetto Farsaci1

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Purpose
Immunotherapies aiming to interfere with the immune checkpoint molecule PD-1 (programmed death-1) and its ligand PD-L1 are currently being investigated in several clinical trials to treat cancer patients. The PD-1 pathway is one of the ways cancer cells evade immune-mediated killing. As little is known about the expression of PD-1 and PD-L1 in cancer patients compared to normal individuals, the aim of this study was to assess PBMC subsets for expression of these markers.

Methods
Twelve immune cell subsets were analyzed by flow-cytometry in 22 cancer patients and 16 normal individuals. The cancer patients consisted of 1 anal, 2 breast, 4 colon, 1 esophageal, 2 mesothelioma, 1 neuroendocrine, 1 non-small cell lung, 1 ovarian, 5 pancreatic, 3 renal cell and 1 squamous cell tracheal cancer patients. The subsets analyzed were CD4 and CD8 T cells, B cells, conventional dendritic cells (cDC), plasmacytoid DC (pDC), natural killer cells (NK), natural killer T cells (NKT), myeloid derived suppressor cell (MDSC), mono-

Figure 1 Differences in PBMC subsets and PD-1 and PD-L1 expression in cancer patients at baseline and normal individuals
cytic MDSC (mMDSC), granulocytic MDSC (gMDSC), and lineage-negative MDSC (Lin-MDSC). We also analyzed surface expression of PD-1 (clone MIH4) and PDL-1 (clone MIH1). See Figure 1.

Results
Compared to normal subjects, cancer patients had some PBMC subsets with changes in frequency but no differences in PD-1 and PD-L1 expression (i.e., B cells, mMDSCs, and gMDSCs). Other subsets showed changes in PD-1 and PD-L1 expression without differences in the frequency of the subset (i.e., CD4, Tregs, cDCs, pDCs, NK, and MDSCs). Lin-MDSCs presented at a higher frequency and greater PD-L1 positivity.

Conclusions
Understanding the differences of PBMC immune subsets between normal subjects and cancer patients, and the surface expression of PD-1 and PD-L1, can provide insights as to which immune subsets can be targeted by therapies aimed at interfering with the PD-1 pathway in cancer patients.

Authors’ details
1Laboratory of Tumor Immunology and Biology, CCR, NCI, NIH, Bethesda, MD, USA. 2CCR, NCI, NIH, Bethesda, MD, USA. 3Genitourinary Malignancies Branch, CCR, NCI, NIH, Bethesda, MD, USA.

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