Issues with anti-Gr1 antibody-mediated myeloid-derived suppressor cell depletion

We read with great interest the article 'Myeloid-derived suppressor cells have a proinflammatory role in the pathogenesis of autoimmune arthritis' by Chunqing Guo *et al*.[1] In this paper, the authors used anti-Gr1 antibody to deplete myeloid-derived suppressor cells (MDSCs) in arthritic mice and they found that it reduced disease severity and Th17 response. However, they did not report the efficiency of MDSC depletion.

Anti-Gr1 antibody (RB6-8C5) was widely used and considered to be effective in eliminating MDSC. Srivastava *et al*[2] found that anti-Gr1 antibody led to a reduction in $Gr1^+$ cells in tumour, blood, spleen and bone marrow (BM). Vincent Hurez used anti-Gr1 monoclonal antibody, which reduced MDSCs by 50%–75% in the spleen of tumour bearing (TB) mice, without reporting the results in BM and tumour.[3] Zhang *et al*[4] found that anti-Gr1 antibody reduced MDSC by one-third in tumour. Thomas Condamine *et al* determined that anti-Gr1 antibody eliminated about 95% of MDSCs in spleen and blood of TB mice; however, it raised the immature myeloid cell (IMC) levels in the BM.[5] Ma *et al*[6] and Kumar *et al*[7] believed that anti-Gr1 antibody could not eliminate $Ly6C^{high}$ MDSCs. Besides, Ma *et al*[6] first indentified that anti-Gr1 antibody failed to reduce MDSCs in the liver. The liver might generate a more favourable environment for MDSCs.[5] The present study did not present the efficacy of depletion at disease sites, spleen and BM.

The efficacy of anti-Gr1 antibody was controversial. In the field of cancer, Srivastava *et al*, Zhang *et al* and many other researchers found that depletion of MDSCs by anti-Gr1 antibody led to the inhibition of tumour volume and tumour weight.[2 4] The results of Hurez *et al*[3] were different. Anti-Gr1-mediated depletion of MDSCs resulted in significantly slower tumour growth in the aged but not the young B16-bearing mice. The study by Kumar *et al*[7] did not find the anti-tumour efficacy of anti-Gr1 antibody. This inconsistence might influence other modes, such as arthritic mice in the present study.

In summary, anti-Gr1 antibody (RB6-8C5) is widely used as an efficient agent for eliminating MDSCs in mice; however, its efficacy on each subtype of MDSCs, polymorphonuclear neutrophil MDSC (PMN-MDSC) and monocyte MDSC (M-MDSC) is still controversial. Meanwhile, there are more debates ongoing about its efficacy in disease control. Using novel methods to deplete MDSCs shall be an acceptable choice.[8]

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