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 al2 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 al4 found that anti-Gr1 antibody reduced MDSC by one-third in tumour.

Thomas Condamine et al5 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 al6 and Kumar et al7 believed that anti-Gr1 antibody could not eliminate Ly6Chigh MDSCs. Besides, Ma et al8 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 al9 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 al10 did not find the anti-tumour efficacy of anti-Gr1 antibody. This inconsistency 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

Yan-Fang Xing,1 Yu-Qi Zhou,2 Guo-Wei Ma,3 Ding-Yun Feng,2 Xiu-Rong Cai,1 Xing Li1

1Department of Nephrology, The Third Affiliated Hospital of Guangzhou Medical University, Guangzhou, People’s Republic of China
2Department of Respiration, The Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, People’s Republic of China
3Sun Yat-sen University Cancer Center, State Key Laboratory of Oncology in South China, Guangzhou, People’s Republic of China
4Department of Medical Oncology, The Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, People’s Republic of China

Correspondence to Dr Xing Li, Department of Medical Oncology, The Third Affiliated Hospital of Sun Yat-sen University, 600 Tianhe Road, Guangzhou 510630, China; lixing9@mail.sysu.edu.cn

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