SERUM CYTOKINE KINETICS IN C57BL/6 VERSUS BALB/C MICE UPON CON A AND LPS STIMULATION IN VIVO

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Background Cytokines, produced by various immune and non-immune cells, exert multiple roles in the interplay of infection, inflammation and cancer immunity. Cytokines serve as biomarkers or critical mediators in a variety of immune-mediated inflammatory diseases (IMIDs), including systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), multiple sclerosis (MS), inflammatory bowel disease (IBD), asthma and psoriasis. In addition, cytokines have also been extensively investigated as either cancer targets or treatments. Either enhancing the growth inhibitory and immunostimulatory effects of cytokines like IL-2, or inhibiting the inflammatory and tumor-promoting actions of cytokines like TNF, has been demonstrated to be able to improve the efficacy of cytokine-based cancer immunotherapies or alleviate the toxicities in the combination therapies. However, many cytokines are expressed at almost undetectable levels in circulation in mice under normal physiological conditions, which has limited the scientific investigations. As a consequence, it’s worth trying different and suitable stimuli to induce the increased production of different cytokines for further detection or exploration.

Methods To detect the cytokine kinetics, the C56BL/6 and BALB/c mice were injected intraperitoneally with 12mg/kg Con A and 5mg/kg LPS, and serum samples were collected at different time points after dosing. The serum concentrations of more than 20 cytokines are monitored and determined through Meso Scale Discovery (MSD).

Results The results indicated that IFN-γ, IL-12/IL-23p40, IL-13, TNF-α, IL-15, IL-17F, IL-22, IL-23 and IL-31 are preferentially stimulated by LPS, whereas IL-2, IL-4, and IL-5 are preferentially stimulated by Con A. In addition, GM-CSF, IL-10, TNF-α and IL-6 represent a group of early produced cytokines while IL-5, IFN-γ, and IL-17F represent a group of late produced cytokines upon stimulation. The kinetics and production levels of GM-CSF, IFN-γ, IL-2, IL-10, IL-12/IL-23p40, IL-15 and IL-33 are very similar in both C57BL/6 and BALB/c mice. In contrast, TNF-α, IL-5 and IL-6 production are higher in C57BL/6 mice than that in BALB/c mice and whereas IL-4, IL-22 and IL-23 production are lower in C57BL/6 mice than that in BALB/c mice.

Conclusions Here, we reported the expression profiles and dynamics of various cytokines in C56BL/6 and BALB/c mice treated with Con A and LPS at various exposure time points. In summary, these data offers a valuable asset for the future intensive researches for the expression and function of proinflammatory or anti-inflammatory cytokines in preclinical mouse models.

REFERENCES