1. No.
   2019G006

2. Title
   Effect of cigarette smoke extract on anti-tumor immunity induced by dendritic cells

3. Period
   2019-2021

4. Summary
   Dendritic cells (DCs) take up antigens derived from pathogens such as bacteria, viruses, and tumor cells, and induce the activation of antigen-specific T cells through major histocompatibility complex (MHC)-mediated antigen presentation. Mainstream cigarette smoke extract (CSE) has various effects, and the effects of the major components, nicotine and tar, have been analyzed extensively. Recently, the physiological effects of nicotine- and tar-removed CSE (CSE) have been also reported. However, the effects of CSE on DC-mediated immune responses remains unknown. In this study, we found that CSE enhanced lipopolysaccharide (LPS)-stimulated induction of cell surface expression of MHC-I and MHC-II in mouse bone marrow-derived DCs (BMDCs). In contrast, CSE suppressed the induction of CD86 induced by curdlan and IFN-γ-stimulation. In addition, CSE suppressed the production of IL-12, IL-23, and IL-10 by LPS and curdlan stimulation. We examined unsaturated carbonyl compounds, crotonaldehyde, methyl vinyl ketone, and acrolein, which are representative components of CSE, and found that MVK enhanced the induction of MHC-II expression induced by LPS stimulation. In the presence of CSE, LPS-stimulated BMDCs showed enhanced activation of CD4 and CD8 T cells and increased IL-2 production from T cells by antigen presentation. In contrast, CSE did not affect the activation of T cells by curdlan- or IFN-γ-stimulated BMDCs, and curdlan-stimulated BMDCs suppressed IL-17 production from T cells and enhanced IFN-γ production. These results suggest that CSE modulates activation signals in BMDCs and enhances the antigen presentation function of LPS-stimulated DCs.