Background and aims C-type lectin domain family 16 member A (CLEC16A) has been associated with autoimmune diseases such as systemic lupus erythematosus, multiple sclerosis and type 1 diabetes in various genome-wide association studies. Subsequent studies revealed that mouse/human CLEC16A and its Drosophila homolog endosomal maturation defective isoform A (EMA) are involved in different aspects of autophagy, the regulated degradation of cellular components that are in excess or dysfunctional. Crosstalk between autophagy and inflammasome activity of innate immune responses has been reported and inflammasomes are activated in various autoimmune diseases. We thus sought to investigate the role of CLEC16A in inflammasome pathway in this study.

Methods Functional genetic studies of CLEC16A in NLRP3 and AIM2 inflammasomes pathways using monocyte-derived macrophages isolated from peripheral blood mononuclear cells of healthy individuals were performed.

Results During induction of NLRP3 inflammasome pathway by nigericin, a knockdown of CLEC16A using specific siRNAs inhibited secretion of interleukin-1β (IL-1β), an inflammasome pathway effector. Its secretion during AIM2 inflammasome induction by intracellular dsDNA poly(dA:dT) however was not affected in the siCLEC16A group. The induction of NLRP3 mRNA level upon lipopolysaccharide stimulation was suppressed in the siCLEC16A group. No significant changes in mRNA levels was observed in other selected genes of NLRP3 inflammasome pathway, namely the adaptor protein ASC, interleukin-1 converting enzyme caspase-1 and precursor pro-IL-1β.

Conclusions These data suggest that CLEC16A regulates NLRP3 but not AIM2 inflammasome pathway and affects IL-1β secretion in part via NLRP3 level. The mechanism involved and its association with autoimmune diseases such as systemic lupus erythematosus remains to be elucidated.

Background and aims To study the role of plasmacytoid dendritic cells (pDCs) in the pathogenesis of systemic lupus erythematosus (SLE)

Methods Totally 9 mouse strains were studied including NZB, NZW, NZBW F1, MRL/lpr, MRL/Mp, BXSB/Mp, BXSB.B6. Yaa, B6.SLE1.2.3 and C57BL/6. Spleen, thymus, bone marrow and lymph node pDCs were collected from mice in different disease stages by using Nycodenz enrichment and sorting systems. Human pDCs from healthy donor and SLE patients were isolated by using BDCA4 beads selection. Mouse pDCs were stimulated with ODN2216 and Poly U for Tlr9 and Tlr7 respectively. Human pDCs were stimulated with ODN2216 and R837 for Tlr9 and Tlr7 respectively. After 18 hour for human and 36 hour for mouse, supernatant was collected for ELISA test. IFNa, TNFa, and IL6 were tested.

Results Bone marrow pDC could produce much higher IFNa than pDCs from spleen, thymus and lymph node in all tested strains. pDCs from NZB, NZBW F1 could produce higher IFNa than those from other strains. Spleen pDCs from MRL/lpr and MRL/Mp mice could produce higher levels of IFNa via Tlr7 than Tlr9 stimulation. All lupus-prone mice except BXSB/Mp and B6.SLE1.2.3 strains have higher total pDCs numbers. Cytokine-producing ability of pDCs were reduced in mice with advanced disease stage. pDCs from SLE patients could produce higher IFNa than those from a healthy donor.

Conclusions Phenotype and function of pDCs were largely dependent on their genetic background. Activation and function alterations of pDCs were observed in a lupus model. Hyperactive of pDC from SLE patients may contribute to lupus pathogenesis.