DELETION OF THE BAFF RECEPTOR TACI FULLY PROTECTS AGAINST SLE WITHOUT REDUCTION OF B CELL NUMBERS AND FUNCTION

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Background and aims B cell-activating factor of the TNF family (BAFF) is an essential B cell survival factor. However, high levels of BAFF promote systemic lupus erythematosus (SLE) in mice and humans. Belimumab (anti-human BAFF) limits B cell survival and is approved for use in patients with SLE. Surprisingly, the efficacy of rituximab in SLE remains controversial, despite depleting B cells more potently than belimumab. This raises the question of whether B cell depletion is really the mechanism of action of belimumab. In BAFF transgenic (BAFF-Tg) mice, SLE development is T cell-independent but relies on innate activation of B cells in cooperation with the BAFF receptor TACI. Therefore, in this study we tested whether TACI, a BAFF receptor dispensable for B cell survival, may have a role in the pathogenesis of SLE.

Methods To test the role of TACI in driving BAFF-mediated autoimmunity, we reconstituted BAFF Tg mice with a TACI-deficient bone marrow and also crossed BAFF Tg mice onto TACI/−/− mice.

Results We show that loss of TACI on B cells protected against BAFF-mediated autoimmune manifestations while preserving B cells, suggesting that loss of BAFF signalling through TACI, rather than loss of B cells, may underpin the effect of belimumab in the clinic. Moreover, a multimeric form of BAFF, very effective at activating TACI, suggests that this abnormal form of BAFF may also be a pathogenic factor in SLE.

Conclusions B cell-sparing blockade of TACI may offer a more specific and safer therapeutic alternative to broad B cell depletion in SLE.

THE CONTRIBUTION OF INTERFERON LAMBDA TO SLE

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Background and aims Interferon lambda (IFN-λ) is a novel type of interferon produced by dendritic cells (DC). Despite its binding to a different receptor, IFN-λ shares functional similarities with type I IFN (IFN-I) by upregulating the expression of IFN-stimulated genes. The role of IFN-λ in DC biology and in autoimmunity remains unknown.

Methods

- Mouse and human DC subsets were stimulated ex vivo and the IFN-λ expression was measured.
- The maturation and the capacity of DC to cross-prime T cells was compared in WT and IFN-λ−/− mice. T cell cross-priming by human DCs was measured ex vivo in the presence of exogenous IFN-λ.
- Serum levels of IFN-λ was measured in lupus-prone mice and in SLE patients. The phenotype of the blood DC subsets from SLE patients was also characterised.

Results

- Mouse plasmacytoid DC (pDC) and CD8+ DC highly secrete IFN-λ. In humans, the CD141+ DC are the major IFN-λ producers.
- IFN-λ enhances the capacities of mouse and human DCs to mature and to cross-prime T cells.
- High serum levels of IFN-λ were detected in lupus-prone mice and in some SLE patients. SLE patients display increased activation of the IFN-producing DC subsets: the pDCs (producing IFN-I) and the CD141+ DCs (producing IFN-λ).

Conclusions IFN-λ is produced by some DC subsets and enhances their functions. Furthermore, IFN-λ is expressed during SLE, suggesting a potential role of the cytokine in the aetiology of SLE.

DECTIN-1 ON MONOCYTIC CELLS MEDIATES ABERRANT INNATE AND ADAPTIVE IMMUNE RESPONSES IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Background and aims Abnormal expression of CD200/CD200R1 may contribute to the immunologic abnormalities in patients with systemic lupus erythematosus (SLE). This study aimed to assess the function of CD200/CD200R1 and impact of CD200-Fc on dendritic cells in lupus-prone NZB/WF1 mice.

Methods Female NZB/WF1 mice were treated with CD200-Fc or control for 4 weeks. Plasma samples were collected to measure autoantibody levels. The expression levels of CD200/CD200R1 in peripheral blood mononuclear cells (PBMCs) and splenocytes were examined.

Results The percentage of CD200/CD200R1-positive cells in splenocytes from NZB/WF1 mice was lower than that of C57BL/6 mice (p<0.05). The plasma level of anti-dsDNA was significantly higher in NZB/WF1 mice than C57BL/6 mice (p<0.001). However, the anti-dsDNA levels decreased (p=0.047) after CD200-Fc treatment. Finally, CD200-Fc reduced the levels of IL-6 (p=0.017) and IL-10 (p=0.03) in the dendritic cell culture supernatant.

Conclusions The immunosuppressive CD200/CD200R1 signalling pathway might be involved in the immunopathology of NZB/WF1 mice; the present results merit further exploration of agents that can modulate the CD200/CD200R1 pathway as a therapy for human lupus.
Background and aims Dectin-1 is a c-type lectin like receptor that signals via syk and is involved in anti-fungal immunity. Dectin-1 was found to trigger experimental inflammatory arthritis, and likely play a role in the pathogenesis of some autoimmune diseases. This study aimed to examine dectin-1 expression and function of circulating CD14+ monocytes and monocyte-derived dendritic cells (MDDCs) in patients with systemic lupus erythematosus (SLE).

Methods SLE patients with active and inactive diseases and healthy subjects were recruited. Dectin-1 agonists including curdlan, zymosan and toll-like receptor agonists Pam3CSK4 (TLR2) and LPS (TLR4) were used to stimulate monocytes and/or MDDCs. Dectin-1, ROS and phosphorylated-syk (p-Syk) were measured by flow cytometry. Cytokine profile was measured by and multi-bead immunoassay.

Results Dectin-1 expressing monocytes was significantly lower in active SLE patients compared to inactive patients and healthy controls. The absolute count of dectin-1 expressing monocytes correlated significantly and inversely with SLEDAI, anti-dsDNA antibody level and C4. Despite this, ROS production upon stimulation by dectin-1 agonists was comparable. Stimulation of dectin-1 led to activation and maturation of MDDCs. SLE MDDCs showed higher p-Syk activation compared to normal MDDCs upon dectin-1 stimulation. Curdlan-stimulated MDDCs produced higher levels of IL-1β, IL-23 and TNF-α. Adding TLR2 agonist to curdlan, SLE MDDCs produced significantly higher level of IL-1β compared to normal MDDCs.

Conclusions Active SLE patients had significantly lower circulating dectin-1 expressing monocytes which produced comparable level of ROS compared to inactive patients and healthy subjects. Dectin-1 agonists led to significantly higher Th17 promoting cytokines upon co-stimulation with TLR2 in SLE MDDCs.