2-Arachidonoylglycerol (2-AG) induces migration of mouse B- lymphocytes

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Background and Aim To develop efficient way of production of IgA monoclonal antibodies, regulation of B-lymphocyte trafficking is important. Sphingosine 1-phosphate (S1P), a lipid mediator, has been demonstrated as a chemotactic factor that is responsible for lymphocyte emigration from secondary lymphoid organs and thymus. 2-Arachidonoylglycerol (2-AG) is one of the lipid mediators, and two types of cannabinoid receptors (CB1 and CB2) have been identified. The cannabinoid receptor on lymphocytes has been determined as CB2. We examined whether 2-AG induces migration of mouse B-lymphocytes. **Methods** BALB/c mice were used to obtain lymphocytes. Splenic lymphocytes were separated by density-gradient centrifugation and Peyer's patch lymphocytes were prepared. For chemotactic assay, lymphocytes were placed in the upper compartment of the Transwell apparatus (5 μm pore-size), and 2-AG was added to the bottom, top, or both compartments. Cells migrated to the bottom compartment were counted under a microscope. Cells were stained with FITC-anti-CD3, FITC-anti-GL7 or FITC-anti-IgA in combination with PE-anti-B220. Cell surface phenotypes (T cells, B cells, germinal center B cells or surface IgA-positive B cells) were determined by flow cytometry. Cells were stained with phalloidin after incubation with 2-AG to detect actin reorganization. **Results and Discussion** The effective range of 2-AG concentration that induces chemotaxis was between 0.1 μM and 10 μM. Chemokinesis was not observed when 2-AG was added to the top compartment alone. Unlike S1P, 2-AG preferentially induced chemotaxis of B cells relative to T cells. Within B cells, naive B cells were more responsive to the 2-AG-induced chemotaxis than germinal center B cells (GL-7 positive) in spleen. As for Peyer's patches, 2-AG preferentially induced migration of IgA-negative B cells compared with IgA-positive ones. Morphological change and actin reorganization were observed after exposure of B cells to 2-AG.