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## Stem cell-based basic to translational research for immune disorders: toward the establishment of cellular platform for the screening of marine natural products

*Key words: mesenchymal stem cells, immunomodulation, inflammatory bowel disease, atopic dermatitis, rheumatoid arthritis*

Mesenchymal stem cells (MSCs) are multipotent adult stromal cells that can self-renew and differentiate into various cell types of mesodermal lineage. Moreover, MSCs are recently known to possess regulatory function on immune cells which makes them a promising tool for the treatment of inflammatory and autoimmune diseases. The interaction between MSCs and immune cells through soluble factors and adhesion molecules has been reported to be crucial for the immunomodulatory effect of MSCs. However, MSC-based cell therapy still has potential limitations and the underlying mechanisms on specific disease remain largely unknown. The main purpose of these studies is to provide the better understanding of immune regulatory mechanisms focused on allergic immune responses and autoimmunity and to suggest the new insight available for bridging the current gap between scientific findings and clinical applications. Several murine models for immune disorders including inflammatory bowel disease (IBD), atopic dermatitis (AD) and rheumatoid arthritis (RA) were established and the efficacy of mesenchymal stem cells was determined. Administration of hMSCs reduced the severity of colitis, atopic dermatitis and arthritis in mice through the regulation of disease exacerbating immune cells. Therefore, these results might suggest novel therapeutic strategies for the treatment of allergic disorders and autoimmune diseases. Furthermore, the establishment of cellular or organoid platform using immune or stem cells can be promising and effective screening tool for marine natural products.

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