IMMUNOLOGY AT THE CONFLUENCE OF MULTIDISCIPLINARY APPROACHES

ABSTRACT BOOK

Institute for Biological Research "Siniša Stanković" National Institute of Republic of Serbia
University of Belgrade

Immunological Society of Serbia

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Friday, December 6th Session: IMMUNOTHERAPY

Poster presentation

BENFOTIAMINE DIRECTS DENDRITIC CELLS TOWARD A TOLEROGENIC PHENOTYPE

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Dendritic cells (DC) are professional antigen presenting cells that have an important role in inducing the immune response. Under normal conditions, DC reside in peripheral tissues in an immature state. However, they undergo a series of maturation steps in response to inflammatory stimuli. During maturation, DC up-regulate major histocompatibility complex (MHC) class II molecules and co-stimulatory molecules (CD40, CD80, CD86) for antigen presentation and increasingly secrete cytokines. Tolerogenic DC (tolDC) have immunoregulatory properties and are characterized by low expression of MHC class II and co-stimulatory molecules, with limited production of proinflammatory cytokines. TolDC-based immunotherapy is a promising perspective in the treatment of autoimmune diseases. Benfotiamine (S-benzoylthiamine-O-monophosphate) is an S-acyl derivative of vitamin B1 with anti-inflammatory and anti-oxidative properties. Here, we explored the potential of benfotiamine to induce tolerogenic phenotype of DC. DC were cultivated from progenitor bone marrow cells isolated from the femur of C57BL/6 mice. The cells were cultured for 7 days in the presence of granulocyte-macrophage colony-stimulating factor (20 ng/mL) with 100 ng/mL lipopolysaccharide added for the last 24 h of cultivation for maturation. Treatment with benfotiamine (100 μM) was performed on days 0, 2, 4 and 6. FACS analysis showed that benfotiamine applied during differentiation of DC suppressed the expression of MHC class II and CD86, while it did not affect the expression of CD40. The secretion of proinflammatory cytokines TNF, IL-1β, and IL-6 was also decreased. Morphological analysis showed that DC treated with benfotiamine were similar in shape and size to immature DC, despite the maturation stimulus that they were exposed to. The effects of benfotiamine are associated with its suppression of NF-κB translocation to the nucleus. Together, these results show that benfotiamine has the potential to direct DC toward tolDC. Studies on the application of benfotiamine-treated DC in animal models of autoimmunity are warranted.