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Post-biotics preferentially induce human macrophages M1 polarization: a valuable effect to balance allergic immune responses and to control infections

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Abstract

Macrophage polarization is a dynamic process through which macrophages acquire specific features whose extremes are represented by M1 and M2 polarization. IL-6, IL-1b, IL-12 and IL-8 belong to M1 macrophages while TGF-b belongs to M2 cytokines. M2 polarization prevalence is observed in allergic diseases. Tyndallization is a thermal process able to inactivate microorganisms (post-biotics) and to allow their use for chronic respiratory disease treatment via immune response modulation.

The present study explores the effects of a blend of tyndallized bacteria (TB) on macrophage polarization. THP-1 derived human macrophages were exposed to different concentrations of TB (106, 5x106, 107, 5x107, 108 CFU/ml) and then cell viability, TB phagocytosis and IL-8, IL-1b, IL-6, IL-12 and TGF-b1 gene expression and release were assessed. IL-8, IL-6, IL-1b and TGF-b1 release was also evaluated in human monocyte-derived macrophages (hMDMs) exposed to TB.

TB were tolerated, early phagocyted and were able to: a) increase IL-8, IL-1b and IL-6 gene expression and release and induce IL-12 gene expression; b) decrease TGF-b1 gene expression and release in THP-1 derived macrophages. The effects on IL-8, IL-6 and TGF-b1 release were confirmed in hMDMs.

In conclusion, TB promote M1 polarization and this mechanism might have a beneficial impact in controlling allergic diseases and infections possibly contributing to prevent disease exacerbations.

We recommend

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