A Screening Platform for Compounds with Potential Immuno-Regulatory Activities Using Human Cord Blood Mononuclear Cells.

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Abstract

A systematic and combinatorial approach was adopted using human umbilical cord blood mononuclear cells (hUCB-MNCs) to screen for potential immuno-regulatory compounds. The hUCB-MNCs contain several types of immunogenic cells, which are a suitable material to mimic the in vivo immuno-response after drug treatment. hUCB-MNCs were treated with various natural products such as quercetin, astaxanthin, caffeic acid, bilobalide, eugenol, rutin and gamma-dodecalactone (gamma-DDL). Phenotypic expression analysis revealed that the subpopulation of CD3(+) T cells, CD56(+) NK cells and CD1a(+) dendritic cells apparently increased after being treated with gamma-DDL for 6 days. The expression of CD56 reached a maximum at 72 h with a dose-dependent relationship. The NK cells activation marker (CD69) also elevated following gamma-DDL treatment. These results demonstrated that the gamma-DDL has immuno-regulatory effects to enhance cord blood NK cells population and bioactivities. Such a high-throughput methodology using hUCB-MNCs may be an effective platform for systematically screening potential immuno-regulatory compounds.