Biological activity of cytotoxic dendritic cells cocultured with cytokine-induced killer cells and their effect on acute leukemia cells

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ABSTRACT. We cocultured cytokine-induced killer (CIK) cells with dendritic cells (DCs) in vitro and investigated their proliferation, immunophenotype changes, secretory cytokine levels, and their antitumor effects on acute myeloid leukemia (AML) cells. DCs and CIK cells were acquired from healthy human peripheral blood mononuclear cells and cocultured as an experimental group, while CIK cells were cultured alone as a control group. Cell numbers were counted by trypan blue staining, cytotoxic activity was measured by a 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide assay, cell phenotypes were detected by flow cytometry, and secreted levels of INF-γ and IL-12 were determined by enzyme-linked immunosorbent assay. The proliferation activity in the experimental group was noticeably higher than in the control group (P < 0.05). Under the same conditions, the ratio of CD3<sup>+</sup>CD56<sup>+</sup> and CD3<sup>+</sup>CD8<sup>+</sup> double-positive CIK cells was significantly elevated when cocultured with DCs (P < 0.05). Compared with the control group, the experimental group had significantly higher levels of secreted INF-γ and IL-12 in the supernatants after 3 days (P < 0.01 and P < 0.05, respectively). The antitumor effect of DC-CIK cells against leukemia cells was much higher than that of CIK cells at an effector-target ratio ranging from 2.5:1 to 20:1 (P < 0.05), and this effect
was positively related to the effector-target ratio. The proliferation activity, level of secretory cytokines, and antitumor effect against AML cells of DC-CIK cells were significantly higher than in CIK cells. This study provides a theoretical and experimental basis for clinical immunotherapy using DC-CIK cells.

**Key words:** Cytokine-induced killer cells; Dendritic cells; DC-CIK; Acute myeloid leukemia cells; Cytotoxic effect