*Enterococcus faecalis* is a resident lactic acid bacterium in the human intestine. Its immunostimulatory action was reported to be enhanced by heat sterilization. To investigate its beneficial actions, we evaluated the ability of 10 *E. faecalis* strains to induce interleukin-12 (IL-12) production in a mouse macrophage cell line, J774.1 and found that the strain, *E. faecalis* IC-1, had a potent IL-12-inducing ability. Furthermore, we investigated the underlying mechanism by treating IC-1 cells with RNase or lysozyme. Its activity almost disappeared and an antagonist of Toll-like receptor (TLR) 7 inhibited this activity. Moreover, lysozyme-treated IC-1 bacteria were not phagocytized by J774.1 cells, and did not induce IL-12 production. Based on our results, we propose that macrophages recognize the cell wall components of IC-1, leading to phagocytosis. The IC-1 RNA is then recognized by TLR7, which induces the production of IL-12.