Effects of *Aloe vera* and *Morinda citrifolia* (Noni) extracts on cell proliferation and alkaline phosphatase activity in human fetal osteoblast cell line

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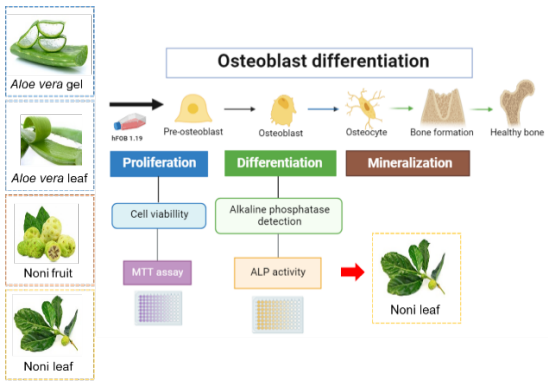
Abstract: Osteoporosis is becoming a major public health problem for elderly women in many countries including Thailand. As reported, *Aloe vera* and *Morinda citrifolia* (Noni) contain several phytochemicals having pharmacological properties with antioxidant and anti-inflammatory. This present study investigated the potential of extracts from *Aloe vera* and *Morinda citrifolia* (Noni) to induce osteoblast differentiation in human fetal osteoblast cells (hFOB1.1.9). Cell viability determined by MTT assay showed that all extracts did not affect cell viability at concentrations from 0.1 to 0.8 ng/ml for 24 and 48 hr after treatment. The results found that all extracts can significantly increase both the cell proliferation and the level of alkaline phosphatase (ALP) activity in hFOB1.1.9 cells (p<0.005). Noni leaf extract showed the maximal cell proliferation at concentration of 0.8 ng/ml for 24 hr with 268% by MTT assay and also had the highest level of ALP activity with 199% after 7 days of treatment (100% of control). Sequentially, noni fruit extract, *Aloe vera* peel and gel extracts showed the cell proliferation with 174%, 140%, 143%, and their ALP activities were 178%, 179% and 130% respectively, by using the 17-β estradiol as a positive control. In conclusion, extracts from *Aloe vera* and *Morinda citrifolia* (Noni) can stimulate the cell proliferation and osteoblast differentiation in human osteoblast cells. This information might be useful for studying the mechanistic effects in human osteoblast cells and the development of supplementary products for prevention or treatment of osteoporosis.

Graphical abstract:



Keywords: *Aloe vera*, Noni, alkaline phosphatase, osteoblast differentiation, human osteoblast

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