

Original Article (Dette er en oppsummering, hele artikkelen er referert over).

Ganoderma lucidum (*Reishi Ganoderma Lucidum*) **Polysaccharides Induce Macrophage-Like Differentiation in Human Leukemia THP-1 Cells via Caspase and p53 Activation**

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Received 22 February 2009; Accepted 26 June 2009

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Differentiation therapy by induction of tumor cells is an important method in the treatment of hematological cancers such as leukemia. **Tumor cell differentiation ends cancer cells' immortality, thus stopping cell growth and proliferation.** In our previous study, we found that fucose-containing polysaccharide fraction F3 extracted from *Ganoderma lucidum* can bring about cytokine secretion and cell death in human leukemia THP-1 cells. This prompted us to further investigate on how F3 induces the differentiation in human leukemia cells. We integrated time-course microarray analysis and network modeling to study the F3-induced effects on THP-1 cells. In addition, we determined the differentiation effect using Liu's staining, nitroblue tetrazolium (NBT) reduction assay, flow cytometer, western blotting and Q-PCR. We also examined the modulation and regulation by F3 during the differentiation process. Dynamic gene expression profiles showed that cell differentiation was induced in F3-treated THP-1 cells. Furthermore, F3-treated THP-1 cells exhibited enhanced macrophage differentiation, as demonstrated by changes in cell adherence, cell cycle arrest, NBT reduction and expression of differentiation markers including CD11b, CD14, CD68, matrix metalloproteinase-9 and myeloperoxidase. In addition, caspase cleavage and p53 activation were found to be significantly enhanced in F3-treated THP-1 cells. We unraveled the role of caspases and p53 in F3-induced THP-1 cells differentiation into macrophages. **Our results provide a molecular explanation for the differentiation effect of F3 on human leukemia THP-1 cells and offer a prospect for a potential leukemia differentiation therapy.**