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IF3, a novel cell-differentiation factor, highly expressed in murine liver and ovary.

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Modern cloning techniques have revealed that the nucleus of fully differentiated mammalian somatic cell is able to initiate and to start　development transferred into an enucleated oocyte. It would thus appear that the product(s) of some gene(s) in oocytes might control somatic cell differentiation. The IF3 gene was isolated by expression cloning from a cDNA library of mouse oocytes by its ability to induce embryonic type alkaline phosphatase (EAP) activity in human embryo kidney (HEK) 293T cells, because EAP is a marker that is undifferentiated state in mammalian cells. IF3 gene was revealed to have no homology to any known gene. The mRNA of IF3 was predominantly expressed in oocytes, ovary, and liver. Its level was decreased in preimplantation development and could not be detected even in 2-cell embryo. Moreover, we demonstrated that IF3 inhibited the differentiation of mesenchymal 2T3 cells. This suggests that IF3 may maintain the cells in the undifferentiated state and/or initiate cell-dedifferentiation. Our findings suggest that IF3 may be one of the factors that regulate oogenesis and certain liver functions.