Effects of Ceramide on c-fos and c-jun Gene Expression during Differentiation of U-937 Cells.

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Effects of ceramide on c-fos and c-jun gene expression during differentiation of U-937 cells were studied. Treatment of U-937 cells with a cell-permeable ceramide resulted in cell differentiation when non-specific esterase activities was monitored as a measure of cell differentiation. Ceramide caused a 50% inhibition of DNA synthesis. The analysis of cell-cycle distribution showed that cells in G1 phase increase from 57% to 73% after 72 hours treatment of ceramide. Moreover, we examined the effects of ceramide on the induction of c-fos and c-jun mRNA. The induction of c-fos and c-jun gene expression was observed in 15 min after treatment of ceramide. Treatment of cycloheximide (10μg/ml) led to two fold increases in c-fos and c-jun expression comparing to that without cycloheximide. These results indicate that ceramide induces the monocytic differentiation accompanied by the inhibition of DNA synthesis, cell-cycle arrest in G1 phase and the induction of c-fos and c-jun gene expression in U-937 cells.

The Influence of Body Temperature on Jumping and Muscle Contractile Performance

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Ectothermic animals experience a broad range of body temperature (Tb) daily and seasonally. It is crucial for these animals to exhibit normal behavior over the broad Tb range in order to escape predation, feed or mate. It is also important that the effect of temperature on muscle performance should be matched with that on whole-organism response since it is the muscle that generate force to power jumping. We test this hypothesis by examining jump velocity of a Korean frog species, R. nigromaculata, and contractile parameters (force, tetanic rise time, and rate of tetanic force production) of the iliofibularis muscle at test temperatures of 15, 20, 25 and 30 °C. We found the optimal temperature of jumping and force production matched very well and was between 20 and 25 °C. This range of temperature could be the one where these animals are most active in their habitat.