細胞生長調節：癌細胞生長、分化、程式死亡時核仁內之調整

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在我們最近的研究中也發現將Hela細胞處理300nM的antimycin A後，分別在含葡萄糖及不含葡萄糖的培養液中培養30分鐘，結果分別使細胞中的ATP含量降低了20%及90%。當Hela細胞培養在同時含有antimycinA及細胞毒殺性藥物(50 ng/ml actinomycin D, 500 ng/doxorubicin或250 ng/ml daunorubicin 2個小時)的無葡萄糖培養液時，沒有B23由核仁移位到核質的現象；但在含葡萄糖的培養液時，此種抑制B23移位的現象就不發生了。

我們選用以triton處理過的通透性Hela細胞作材料。當此種通透性細胞以0.5 mM ATP處理1小時後，原本位於核仁的B23移位到核質和細胞質裡去了。在另一個由digitonin所造成的通透性Hela細胞中也得到類似的結果。由ELISA和Western blotting的結果，經ATP處理後，B23無論在量或高聚合體與單體形式的比例上，都沒有變化。因此，以ATP處理通透性細胞後，只造成B23在核仁、核質與細胞質間重新分佈而已。以0.5mM CTP處理2小時，也具有同樣的造成B23移位的效果。以0.05-1.0 μg/ml之actinomycin D處理1小時，0.25-1.0 μg/ml的doxorubicin或daunorubicin處理後，在缺乏ATP的狀況下，不會引起B23的移位；而在ATP濃度小於0.25mM時，以actinomycin D處理也沒有移位反應。

Cell Growth Regulation: Regulatory Control in Nucleous for Tumer Cell Proliferation, Differentiation and Apoptosis

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The shifting of nucleophosmin/B23 from nucleoli to nucleoplasm in HeLa cells induced by cytotoxic drugs as detected by immunofluorescence (B23-translocation) is inhibited by concomitant treatment with antimycin A in glucose-free medium. Incubation of HeLa cells with antimycin A (300 mM; 30 min) and glucose-free medium resulted in ~90% reduction in cellular ATP pools. To study biochemical events in B23-translocation, we have used an in vitro system involving Triton-permeabilized HeLa cells. Incubation of permeabilized cells with ATP (0.5 mM; 1 h) resulted in shifting of nucleophosmin/B23 from nucleoli to nucleoplasm and cytoplasm. Similar to the drug-induced B23-translocation in the whole cultured cells, there is no reduction (by ELISA) or degradation of nucleophosmin/B23 or change in the ratio of high Mr form to monomer form of nucleophosmin/B23 (by Western Blotting) during the ATP treatment in permeabilized cells. Together, these results implicate the ATP requirement for redistribution of nucleophosmin/B23 from nucleoli to nucleoplasm. Because this permeabilized cell model is simple, efficient and works effectively with exogenous factors, it will prove powerful for investigating the biochemical features of B23-translocation.