

Effect of Environmental Endocrine Disruptors on Proliferation and Differentiation of Cultured glial cells, with Special Reference to the PKA/PKC Balance

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While C6 glioma cells come from neoplastic cells, they maintain the essential functions of astrocytes and are an extremely useful cell line when investigating the significance of various kinase in the proliferation and differentiation of astrocytes. There is high protein kinase A (PKA) activity during the proliferation of C6 cells, but when the cells reach a subconfluent state this activity seems to switch over to a rise in protein kinase C (PKC) activity. Processes form on the cells and the cells develop a network with these processes. However, the additional of genistein, which severely inhibits both PKA and PKC activity, cause the C6 cells to lapse into apoptosis. If bisphenol-A is added during proliferation, proliferation stops and process formation starts. Conversely, addition of pesticide such as bisphenol-methoxychlor when substantial process formation is occurring causes extreme depression of such formation. These results show us how closely the balance between PKA and PKC activity is related to C6 cell proliferation, differentiation, and maintenance of the cellular state, however, environmental endocrine disruptors such as plants, plastics and pesticides, had a strong inhibitory effect on these activities. The fact that environmental endocrine disruptors promote apoptosis is extremely useful information as part as our basic knowledge relating to the failure/destruction of blood-brain-barrier (BBB).

This work was supported in part by a Grant-in-Aid for Scientific Research from the Ministry of Education, Science, and Culture of Japan to K.S. (11670023)