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Effect of antisense oligodeoxynucleotide for sepiapterin reductase on the viability of PC12 cells in the presence of exogenous carbonyl compounds.

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Sepiapterin reductase (SPR) is known as an essential enzyme for the biosynthesis of tetrahydrobiopterin. SPR belongs to the short-chain dehydrogenase/reductase (SDR) family and also reduces various exogenous carbonyl compounds including phenylpropanedione. We found in the present study that phenylpropanedione decreased the rate of proliferation of PC12 cells and that this rate was further diminished by the transfection of the cells with antisense oligodeoxynucleotide for SPR mRNA. When the cells were treated with *N*-acetylserotonin, a specific inhibitor of SPR, in the presence of phenylpropanedione, the cell number decreased to almost the same level as when the cells were transfected with the antisense oligodeoxynucleotide. Thus, the SDR activity of SPR in PC12 cells may serve for detoxification of exogenous carbonyl compounds besides functioning as a specific enzyme for the formation of tetrahydrobiopterin.