Bromocriptine Reverses P-Glycoprotein-mediated Multidrug Resistance in Tumor Cells

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This study evaluated whether bromocriptine, a D\textsubscript{2} dopaminergic receptor agonist, influenced anticancer drug cytotoxicity and P-glycoprotein activity in a P-glycoprotein-expressing cell line compared to a non-expressing subline. The Ki values for P-glycoprotein of cyclosporine and verapamil were 1.09 and 540 \(\mu\)M, respectively, and that of bromocriptine was 6.52\(\mu\)M in a calcein-AM efflux assay using porcine kidney epithelial LLC-PK1 and L-MDR1 cells, overexpressing human P-glycoprotein. Bromocriptine at 10 \(\mu\)M reduced the IC\textsubscript{50} of doxorubicin in K562-DXR from 9000 to 270 ng/ml and that of vincristine in K562-VCR from 700 to 0.30 ng/ml, whereas the IC\textsubscript{50} values of doxorubicin and vincristine in the K562 subline were only marginally affected by these drugs. These observations suggest that bromocriptine has the potential to reverse tumor multigrug resistance involving the efflux protein P-glycoprotein in the clinical situation.