Protein Tyrosine Phosphatase Silencing in Combination with Vincristine as a Strategy to Overcome Leukemia Malignancy

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Resistance to chemotherapy is a major obstacle in the treatment of cancer patients. Therefore, a new therapeutic strategy capable to overcome the resistant phenotype is urgently called for. The protein tyrosine phosphorylation is the most important signal necessary to promote cell growth, proliferation, invasion and migration of normal and cancer cells. The main aim of this work was to sensitize the resistant leukemia cells (Lucena cells) through the low molecular weight protein tyrosine phosphatase (LMWPTP) silencing in combination with vincristine administration. For this purpose, the LMWPTP was silenced by using interference RNA; after 72 h the cells (100,000 cells) were treated with 500 nM vincristine for 24 h. The efficiency of the LMWPTP silencing was checked by western blotting, which was around 80%. Importantly, when the cells were treated with 500 nM vincristine we observed that the cells sensitivity towards this chemotherapic dramatically increased. In addition, we observed a decrease of the platelet-derived growth factor receptor phosphorylation, which indicates an inhibition of this receptor. Our findings suggest that the strategy to combine gene expression modulation of the LMWPTP with administration of vincristine might be interesting to diminish the malignancy of leukemia cells.

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