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Characterization of PRL-3 Oncogenic Phosphatase in Its Role in Mediating Acquired Resistance to Bortezomib in Multiple Myeloma

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Abstract : In this paper, we investigated how PRL-3 expression in H929 and U266 cells affects the efficacy of drug treatment. H929 and U266 cells were treated with Bortezomib (BTZ) of different concentrations, and it was observed that H929 cells were resistant to BTZ, while U266 cells were not viable. Investigations into how BTZ targets these cells were conducted, and it was observed that BTZ affects the PARP-Caspase3 pathway as well as PRL-3-Leo1 pathways. These pathways regulate cell proliferation and cell cycle, respectively. Hence, we are able to show the mechanism of how BTZ affects cells and also the role PRL-3 plays on downstream oncogenes such as cyclin-D1 and c-MYC. More importantly, this investigation into PRL-3 in BTZ resistance will be highly applicable in the future as the first clinical trials of PRL-3 antibody (PRL3-zumab) are ongoing at the National University Hospital, Singapore (NUHS). This would mean that understanding the mechanism of resistance through PRL-3, which has yet to be studied, will demonstrate the potential of PRL-3 in developing novel strategies to improve the treatment of MM.

Keywords : drug resistance, hematology, multiple myeloma, oncogene
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