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Cell-cycle synchronization reverses Taxol resistance of human ovarian cancer cell lines

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Taxol inhibits cell replication by disrupting normal mitotic spindle formation and arresting cell growth in the M phase of the cell cycle. Passage through mitosis is an absolute requirement for Taxol-induced death. The replication time of some ovarian cancer cells is approximately 27 h and resistant cell lines even more longer. Results from our laboratory indicates that most cells were in G0/G1 or S stage during the whole cells cycle and the resistant cell lines have a significantly higher proportion of cells existing in the G0-G1 stage of the cell cycle compared to the sensitive cell lines. Thus, a disparity exists between the longer doubling time of cancer cells (27 h) and the shorter window of Taxol action (3 h-9 h), as such most cells do not occupy the M stage during the short window of Taxol action. We speculated that formation of drug resistance toward Taxol in ovarian cancer could be partly attributed to the longer doubling time of these cells. We used cell-cycle synchronization to test the above assumption. Cell-cycle synchronization resulted in an increase in the number of cells passing through the M stage at a given time and reduced the toxicity of Taxol toward cells in the non-proliferative phase, improving its effectiveness and decreasing the chance of drug-resistant formation.

Biography

Xueqing Wang worked in the Department of Obstetrics and Gynecology of Beijing Jishuitan Hospital as a Doctor and graduated from Peking Union Medical College Hospital with Doctoral degree in 2008. She has published many papers in reputed journals.

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