



# Abnormal expression of PTEN and PIK3CA in pemetrexed-resistant human pancreatic cancer cell line Patu8988

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**ABSTRACT.** The aim of this study was to investigate the expression of PTEN and PIK3CA in the pemetrexed-resistant human pancreatic cancer cell line Patu8988, and to evaluate their effects on the biological behavior of pancreatic cancer cells. PTEN and PIK3CA gene and protein expressions were detected by reverse transcriptase polymerase chain reaction (RT-PCR) and western blot, respectively, in a pemetrexed-resistant pancreatic cancer cell line and in the parent strain of the pancreatic cancer cells. The discrepancies between the two types of cell lines were detected by a transwell test. RT-PCR and western blot analyses revealed that PTEN and PIK3CA were overexpressed in the pemetrexed-resistant pancreatic cancer cell line. PTEN and PIK3CA were shown to be upregulated by 89 and 76% (western blot), respectively, in the pemetrexed-resistant cell line, compared to the normal pancreatic cancer cell line. The migratory and invasive abilities

of the pemetrexed-resistant pancreatic cancer cell were significantly reduced compared to those of the parent strain ( $P < 0.05$ ; transwell assay). Both PTEN and PIK3CA expression was abnormally enhanced in the pemetrexed-resistant cell line Patu8988; the co-existence of high levels of PTEN and PIK3CA in the pemetrexed-resistant pancreatic cancer line cells induced a significant decrease in their migratory and invasive capacities. This suggested that the mechanism of pemetrexed resistant may be affected by PTEN and PIK3CA, and that these may alter the biological behavior of cancer cells.

**Key words:** PTEN; PIK3CA; PI3K/Akt signal transduction pathway; Pancreatic cancer; Acquired drug-resistance; Pemetrexed