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Effects of folic acid on progesterone-enhanced Breast Cancer cell proliferation and migration

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Previously, we have demonstrated that female sex hormone receptors and folic acid receptor form a complex and female sex hormone can abolish the folic acid-inhibited proliferation and migration in endothelial cells. The findings of interaction between female sex hormone and folic acid led us to propose that folic acid might interfere with the progesterone-enhanced breast cancer cell proliferation and migration. In the present study, we demonstrate that treatment with progesterone enhanced proliferation and migration of breast cancer cell lines (T47D, MCF-7 and BT474), while co-treatment with folic acid abolished the progesterone-induced enhancement of proliferation and migration in these breast cancer cell lines. Since we previously showed that progesterone enhanced breast cancer cell

proliferation and migration through activating the cSrc-mediated signaling pathway, we investigated the molecular mechanism underlying folic acid-prevented the progesterone-enhanced breast cancer cell proliferation and migration by examining the effect of co-treatment with progesterone and folic acid on the cSrc activity. Our data showed that co-treatment with folic acid and progesterone increased the formation of p140Cap-cSrc complex, subsequently activating Csk, which in turn phosphorylated cSrc at Tyrosin-527, thereby causing cSrc inactivation. The findings of this study might provide a new strategy for preventing the progesterone-enhanced breast cancer progress

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