Impact of protein tyrosine kinase 6 (PTK6) on human epidermal growth factor receptor (HER) signalling in breast cancer.

PTK6, also known as Brk, is highly expressed in over 80% of breast cancers. In the last decade several substrates and interaction partners were identified localising PTK6 downstream of HER receptors. PTK6 seems to be involved in progression of breast tumours, in particular in HER receptor signalling. Here, we show the down-regulation effects of PTK6 in the T47D, BT474 and JIMT-1 breast cancer cell lines. PTK6 knockdown leads to a decreased phosphorylation of HER2, PTEN, MAPK (ERK), p38 MAPK, STAT3 and to a reduced expression of cyclin E. Our findings show that silencing PTK6 impairs the downstream targets of HER receptors and consequently the activation of signalling molecules. Furthermore, lower levels of PTK6 result in reduced migration of T47D and JIMT-1 breast cancer cells. Due to decreased migration, the PTK6 RNA interference might contribute to reduced metastasis and malignant potential of breast cancer cells. Since PTK6 plays an important role in HER receptor signal transduction, its down-regulation might be suitable for future therapy approaches in breast cancer.