Abstract

Recent studies indicate the existence of a subpopulation of cells within tumours with stem cell-like characteristics. These “cancer stem-like cells” (CSCs) are relatively resistant to established therapies, usually targeting differentiated and fast proliferating cells. Therefore, CSCs may be a reason for the relapse of neoplastic diseases. CSCs can be characterised by a specific gene expression profile and deregulated signalling pathways. Of these, upregulation of the erbB-2 (HER2) receptor, a hallmark of ~25-30% breast cancer patients, is related to dismal prognosis, elevated proliferation potential and resistance to chemotherapy. Recent evidence has suggested that upregulation of erbB-2 leads to increase in the pool of CSCs. In our study we used mammospheres, cells grown in the absence of serum, an *in vitro* model of breast CSCs, which were prepared by “weaning” breast cancer MCF7 cells to a special medium. These cells were $CD44^{high}$ and showed increased expression of ABCG-2, Sox-2, Vimentin as well as high levels of erbB-2. Next, we prepared a stable line of MCF7 cells with low levels of erbB-2 by shRNA. $ErbB\text{-}2^{low}$ cells were characterised for expression of set of CSCs markers and tested for tumour forming efficacy in nude mice using ultrasound imaging.

Keywords

Cancer stem-like cells, erbB-2, breast cancer, mammospheres