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Letter to the Editor

Rab GTPases and breast cancer progression

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Letter to the Editor

Dear Editor,

I would like to briefly describe the regulatory functions of Rab GTPases on vesicular transport of cell surface-bound proteins and/or molecules in Breast cancer (BC) progression and metastases.

A Brief Overview of BC Progression and Metastases

BC, a heterogeneous disease, is thought to be the second leading cause of death in women globally. In only 70-80% of the BC patients with early-stage, non-metastatic disease is curable [1]. In advanced BC metastasis, it is incurable [2]. The major factors predominantly causing BC occurrence, in general, include [1] reproductive and hormonal risk factors such as early age and/or later age at menopause, advanced age at first birth, less breast feeding, menopausal hormone therapy, and oral contraceptives, lifestyle risk factors such as excess body weight, physical inactivity, and alcohol intake, as well as genetic predisposition (germline mutations of high-penetrance genes such as BC1/2 (BRCA1/2), partner and localizer of BRCA2 (PALB2), ATM, checkpoint kinase 2 (*CHEK*2), RAD51 homolog C (RAD51C), BRCA1 associated RING domain 1 (BARD1), TP53, etc.] [3-9], and notably the activation of human epidermal growth factor receptor 2 (HER2, encoded *ERBB2*) [10]. Many of such events are accelerated by vesicle-mediated transport of cargos among subcellular compartments. Of these, Rab GTPases, mediating via coordinated and dynamic intracellular membrane trafficking alongside cytoskeletal pathways, determine the homeostatic maintenance and a variety of cellular functions in many types of human cells such as neuron cells [11,12], immune cells [13-15], osteoclasts [16-21], cancer cells [22-24], and bone metastasis [25,26], etc. A recent study has revealed that Rab26 negatively regulates migration and invasion of BC cells via abrogating the focal adhesion association of Src kinase and inducing endosomal translocation of Src [23] whereas Rab25, also known as Rab11c, alleviated apoptosis and enhanced the aggressiveness of BC cells [27]. Besides, Rab11 is thought to be essential for regulating the localization of Arf6 in MDA-MB-231 BC cells, thereby modulating the cell motility [27]. Rab27B, an oncoprotein, controlled vesicular exocytosis and released vital growth regulators into the tumor microenvironment, leading to promote the invasiveness and metastasis in ER-positive human BC tumors [28]. However, whether Rab GTPases work individually or in a related network is still controversial. Furthermore, more studies need to be done to investigate functional roles of other Rab GTPases in cancers to hopefully establish the program of drug development that targets Rab GTPases. In conclusion, it might be a potential strategy to potentiate BC cancer treatment methods.

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