Reviewer's report

Title: Expression of inwardly rectifying potassium channels (GIRKs) and beta-adrenergic regulation of breast cancer cell lines.

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Reviewer: Satya Narayan

Reviewer's report:

In this manuscript the authors have examined the expression levels of G-protein coupled inwardly rectifying potassium channels (GIRKs) and beta-adrenergic regulation in breast cancer cells lines. In previous studies a subset of adenocarcinomas that is regulated by beta-adrenergic and arachidonic acid-mediated signal transduction pathways has been shown at various organ sites. The expression of mRNA that encodes GIRK1 has been shown in tissue samples from approximately 40% of primary human breast cancers.

In the present communication several breast cancer cell lines were screened for the expression of GIRK channels by RT-PCR. Cell cultures of breast cancer cells were treated with beta-adrenergic agonists and antagonists, and changes in gene expression were determined by both relative competitive and real time PCR. Potassium flux was determined by flow cytometry and cell signaling was determined by western blotting. The manuscript is short but clearly written. It provides an evidence of the expression of GIRKs in breast cancer cells lines. There are some minor issues that can be taken care before this manuscript can be accepted for publication in BMC Cancer.

1. Data shown in Figure 1 describes mRNA levels of GIRK1 in MCF-7, MDA-MB-361 MDA-MB 453, and ZR-75-1 but not in MDA-MB-468 and MDA-MB-435S cell lines. GIRK4 was expressed in all six breast cancer cell lines tested, and GIRK2 was expressed in all but ZR-75-1 and MDA-MB-435. Since there are four GIRKs in cells, and the heterodimers of GIRK1 and GIRK4 play an important role in channel signaling, the expression level of GIRK3 was not examined in these studies. Either this experiment needs to be included or a proper explanation needs to be provided.

2. There is an interesting observation between the expression levels of GIRK1 and cyclophylin. The cell lines expressing more GIRK1 expressed low levels of cyclophylin (Figure 1). What is the significance of this inverse relationship? Is it a technical problem or true findings? However, these results do not correspond with results shown in Figure 2 in which the observed inverse relationship cannot be seen suggesting to me that the results presented in Figure 1 have technical problems. That needs to be properly addressed. The level of cyclophylin needs to be included with samples used for GIRK4 RT-PCR.

3. The results presented in Figure 3 should be quantitated and normalized with 18S for a clear presentation. The exposure of the gel is so high that the real expression level cannot be determined.

What next?: Accept after minor essential revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:

None