Reviewer's report

Title: Enhanced Efficacy of Photodynamic Therapy by Inhibiting ABCG2 in Colon Cancers

Version: 2  Date: 18 February 2015

Reviewer: Angeles Juarranz

Reviewer's report:

This is an interesting ms relating with the role of the ATP-binding cassette subfamily G2 (ABCG2) in the regulation of endogenous protoporphyrin levels in Photodynamic therapy (PDT). The study has been performed by using two different colon cell lines: SW480 and HT29, that showed low and high ABCG2 expression levels, respectively. They used Pyropheophorbid-a (PPa) as a photosensitizer. They conclude that the response to PDT is related with the level of expression of ABCG2. The role of ABCG2 in the response to PDT has been studied in different cell lines but not in colon cell lines; this is claimed by the authors in this paper.

In general terms, the manuscript is well written, the experiments have been appropriately designed and described and the results are clearly presented. I, therefore, suggest its publication in BMC, after including the corrections indicate below.

Major revisions:

In Fig. 1 authors show the expression of ABCG2 in several cell types. In the M&M section they only describe the two main types of cells used in the work, SW480 and HT29, but not the rest of the cells: DLD1, LoVo and HCT116. The description of these cells must be included in the cell line types in the M&M section.

Related with the previous observation, it is not clear why authors have only checked SW480 and HT29 cell lines. The question is: there is not any other colon cell line with high ABCG2 expression apart from HT29? In addition, they indicate that SW480 is the cell line that less ABCG2 expression shows; however, from the results shown in the Fig 1, its ABCG2 expression is the same as HCT116 (no significant differences between both cell lines are indicated). Taking into account that SW480 is a heterogeneous culture formed by two different cell types (rounded and flatted cells), I do not agree with the selection of SW480 instead of HCT116 which shows a much more homogeneous morphology than SW480.

Statistical signification must be included along the work, but in particular in Fig 1 and Fig 2 to justify the selection of the cells types.

In the M&M section it is not indicated if the incubations with PPa are performed in
the presence or absence of serum. Since the presence of serum in the culture medium can influence the response to PDT, authors should clearly indicate how they have performed the experiments and demonstrate that this factor (serum) does not influence the response to PDT (see: Moll Cell Biochem 2011 358: 197-307 by Tetsuya Ogino et al.).

Minor revisions:

Include also in the M&M section the origin and the source of all antibodies (caspase 3, LC3).

The ms presents several typographical errors please check it.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

No conflict of interest