Reviewer's report

Title: Glutamate acid decarboxylase 1 promotes metastasis of human oral cancer by beta-catenin translocation and MMP7 activation

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Reviewer: I Chieh Chen

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In this study, the authors explored the connections between GAD1 function/regulation and oral squamous cell carcinoma (OSCC). The authors demonstrate that up-regulation of GAD1 was a characteristic event in oral squamous cell carcinoma and that GAD1 was correlated with cellular invasiveness and migration by regulating #-catenin translocation and MMP7 activation. The authors also analyzed the GAD1 protein expression from 80 OSCC patients using the IHC scoring system and found that GAD1-positive OSCCs were significantly higher than in normal oral tissues. The finding indicates that the GAD1 may be important for controlling invasion and metastasis in oral cancer. This appears to be a well-executed study and provides interesting new data on the possible role of GAD1 in OSCCs. However, a few concerns should be addressed:

Major Compulsory Revisions
1. It would be nice if the #-catenin localization and MMP7 expression of the patients with OSCC could be compared between normal and tumor tissues.

2. In Figure 3a and Figure 5a, the data shown that following GAD1 knockdown leads to loss of #-catenin in the nucleus, however this dramatic loss is not accompanied by a concomitant increase in #-catenin levels in the cytoplasm fraction. Author either show the total #-catenin levels or quantify the WB levels, or modify the result and discussion to accommodate this discrepancy.

3. Finally, immunocytochemistry images would greatly illustrate data regarding nuclear activity of #-catenin.

Minor Essential Revisions
1. Table 1, stage column missing in the table.

2. Page 27, Figure legend of Figure 5: replace “nuclei” with “nucleus”.

3. Please increase font size in figures, the text is difficult to read.

Discretionary Revisions
Can the authors analyze the MMP7 activity of blood from the patients with GAD1-positive OSCCs? Should that the GAD1 may be can as a molecular marker for early detection of invasion and metastasis of oral cancer?
Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.