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Peer Review

Review of: "Anti-metastasis After Bee Venom and Melittin by Upregulation of BRMS1 and DRG1 Genes, With Downregulation of WNT7B in Breast Cancer Cells"

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This manuscript explores the effects of bee venom and its major component, melittin, on migration-related behavior and the expression of selected metastasis-associated genes in metastatic breast cancer cells. The topic is of potential interest, and the experimental workflow is generally clear. The parallel use of MDA-MB-231 and non-tumorigenic MCF10A cells, together with cisplatin as a reference treatment, is appropriate and provides a useful comparative framework.

However, the current data do not adequately support the strength of the mechanistic interpretation or the broad anti-metastatic conclusions drawn by the authors.

The evidence for anti-metastatic activity is based almost exclusively on wound-healing assays. While informative for collective cell motility, this approach offers limited insight into metastatic potential and is highly sensitive to confounding effects from proliferation or cytotoxic stress. As presented, the data fall short of what is typically expected to substantiate anti-metastatic claims. Additional functional assays, such as transwell migration and invasion analyses, would be necessary to strengthen this conclusion.

The proposed mechanisms rely largely on qPCR-based changes in BRMS1, DRG1, CD82, and WNT7B expression. These findings remain descriptive, as no gain- or loss-of-function experiments are provided to establish causality between gene expression changes and the observed phenotypes. Consequently, the inferred regulatory relationships remain speculative.

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It is also notable that similar gene expression changes are observed in MCF10A cells following treatment, raising concerns regarding specificity and the possibility of non-selective or stress-related effects. This issue is not sufficiently addressed in the current discussion. Likewise, the involvement of WNT7B and Wnt-related signaling is inferred solely from expression data, without direct assessment of pathway activity.

In terms of presentation, clearer labeling of treatment conditions and time points in several figures would improve clarity, and statistical reporting should more explicitly state sample sizes and analytical methods. The discussion would also benefit from a more restrained assessment of novelty in light of existing studies on bee venom and melittin in cancer models.

Overall, the study provides preliminary observations suggesting that bee venom and melittin can influence migration-associated behavior and gene expression in breast cancer cells. Without additional functional validation and a more cautious mechanistic framework, however, the conclusions remain premature.

Declarations

Potential competing interests: No potential competing interests to declare.