Reviewer’s report

Title: Expression profiling identifies genes involved in neoplastic transformation of serous ovarian cancer

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Reviewer: Martin M Matzuk

Reviewer’s report:

The manuscript by Merritt et al describes mRNA profiling of various serous ovarian cancer specimens (low malignant potential versus invasive) as well as controls (either benign serous or normal ovary). Similar types of analysis have been performed previously, and it is not unexpected that the authors found differences in gene expression. The authors focused on 6 genes and did additional followup analysis on two. There are several issues with the data as follows:

Major Compulsory Revisions

1. Since the authors focus on Wnt7A for the verification studies, the paper should really be about the WNT pathway. The authors fail to give additional details about the other wnt factors expressed in the ovarian cancers and OVCAR-3 and the other proteins in the pathway. In addition, do the other serous cell lines that have WNT7A expression show increased migration and invasive characteristics compared to OVCAR-3? Are other Wnt proteins present in the OVCAR-3 cells? The authors should show that a knockdown of WNT7A in one of the other cell lines has the opposite effect on migration and invasion. Could the authors use a different Wnt family member and get the same effect? Lastly, since WNT7A has its effect extracellularly, this means that the pathway must be intact in those cells.

2. The authors should calculate the chance number of genes that would be observed in their experiments. Could a number of the genes identified be observed by chance?

Minor Essential Revisions

3. Are the benign serous samples in fact serous cystadenoma samples? If so, this should be mentioned.

4. The authors overemphasize their point about what is a good control and that a Mullerian derived benign tumor is a better control. It is not clear what the best control is for any cancer study. Perhaps they need to tone down these statements.

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

Quality of written English: Acceptable
**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests