Reviewer 1 | 12 Jun 2021 | 19:59 #1

The manuscript is well written. I have only minor suggestions.

1. Reference #33 is not appropriate. This reference is not cumulus-oocytes. There are MANY good references on cumulus-oocyte communication regarding cGMP/cAMP. Also, in the manuscript at line 156, cGMP is the primary molecule that transfers from cumulus cells to the oocyte. The cGMP cascade controls the cAMP in the oocyte. See articles by Dr Laurinda Jaffe's research group.

2. A figure or table showing the 8 potential markers and how they affect the oocyte would be an interesting, but not essential addition.

3. Please add information on how these markers are being detected in the studies referenced. Are they running standard RT-qPCR on granulosa cells, cumulus cells, or culture media?

QUALITY ASSESSMENT

Q 6 Quality of generalization and summary

Q 7 Significance to the field

Q 5 Please provide your detailed review report to the editor and authors (including any comments on the Q4 Check List):

Reviewer 2 | 21 Jun 2021 | 02:42 #1

The authors should provide a table to show other biomarkers associated with oocyte maturation which were not discussed in the MS and give a short description about their function and disadvantages for not be good biomarkers. Correspondingly, some words should be added in discussion.

My main suggestion is to include a diagram to show the distribution of these non-invasive biomarkers during the process of egg cell maturation in cumulus-oocyte complex. In this way, it is easier for non professional readers to understand.

Other suggestion, the different genes encoding secreted peptides between mature and immature oocytes could be revealed by deep-sequencing and these peptides could be as candidate biomarkers. Could the authors collected the data (if any) and discuss the point?

Corresponding Author: Batara Sirait | 19 Jul 2021 | 15:09 #2

We appreciate the time and effort that you have dedicated to providing your valuable feedback on our manuscript. We are also grateful to receive your insightful comments. Here are our responses for your comment and suggestion:

1.A paragraph has been added to discuss other biomarkers that were expressed differently in oocytes of different

Oocyte Competence Biomarkers Associated with Oocyte Maturation: A Review

BataraSirait* , Budi AuliaWiweko, Budi Wiweko, Dein Iftitah and Raden Muharam

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Received on: 15 May 2021, **Edited by:** Francesca Elizabeth Duncan
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You are pending to respond to Reviewer 2 and/or resubmit a new version of your manuscript.

Reviewer 1 endorsed publication of this manuscript.

	Reviewer 1	Author comments for reviewer 1	Reviewer 2	Author comments for reviewer 2
Recommendation for the editor	The manuscript can be accepted		Revision is required	
Please provide your detailed review report to the editor and authors	The manuscript is well written. I have only minor suggestions. 1. Reference #33 is not appropriate. This reference is not cumulus-oocytes. There are MANY good references on cumulus-oocyte communication regarding cGMP/cAMP. Also, in the manuscript at line 156, cGMP is the primary molecule that transfers from cumulus cells to the oocyte. The cGMP cascade controls the cAMP in the oocyte. See articles by Dr Laurinda Jaffe's research group.	1. Reference #33 has been updated with a relevant one. cGMP has been added as one of the factors causing Meiotic maturation arrest. 2. A figure has been added to better visualize the potential role of each gene in predicting an IVF outcome 3. Detection of each of these markers is described in the summary table 1. In most of the referred studies, extraction of genetic material from the cumulus and	The authors should provide a table to show other biomarkers associated with oocyte maturation which were not discussed in the MS and give a short description about their function and disadvantages for not be good biomarkers. Correspondingly, some words should be added in discussion. My main suggestion is to include a diagram to show the distribution of these non-invasive biomarkers during	We appreciate the time and effort that you have dedicated to providing your valuable feedback on our manuscript. We are also grateful to receive your insightful comments. Here are our responses for your comment and suggestion: 1.A paragraph has been added to discuss other biomarkers that were expressed differently in

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		Thank you		

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Independent review start date: 24 May 2021
Interactive review activated date: 02 Jul 2021

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Reply for the editor Dear Francesca Elizabeth Duncan Editor of Front. Cell Dev. Biol. - Molecular and Cellular Reproduction We thank you immensely for giving us the chance to revising our manuscript. Our reply point-to-point according to reviewer comments or suggestion has been explained within the revised version. All changes have been highlighted using the track-changes mode. Thank you	