Reviewer's report

Title: Combination of four molecular markers improves thyroid cancer cytologic diagnosis and patients management

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Reviewer: Kyung Tae

Reviewer's report:

The authors analyzed the diagnostic role of BRAF mutation and expression of KIT and TC1 genes, and 2 microRNA of miR-222, miR-146b in preoperative thyroid FNA samples. Computational models (Neural Network Bayesian Classifier, discriminant analysis) were built and the Bayesian Neural Network and discriminant analysis showed a very strong predictive value in discriminating malignant from benign nodules.

Two novel molecular tests (Gene#expression classifier and gene mutational panel) have become commercially available, but, they are still somewhat limited in the diagnosis of thyroid cancer. This is an interesting paper, and authors reported promising results in the role of molecular marker for diagnosis of thyroid cancer.

I have Discretionary Revisions.

Discretionary Revisions
1. Most readers are not familiar with Bayesian Neural Networks and the discriminant analysis. Could authors describe it in detail?
2. MicroRNA can be detected in sera of patients with cancer. It is better to provide the correlation of the expression of miR-222 and miR-146b between tumor tissue and patient’s sera.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

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.