Reviewer's report

Title: The breast cancer genome - a key for better oncology

Version: 1 Date: 13 September 2011

Reviewer: Brian Leyland-Jones

Reviewer's report:

The review article entitled “The breast cancer genome – a key for better oncology” is a short yet informative work that summarizes the current state of art regarding “Molecular classification of breast cancer”, “The era of sequencing of cancer genomes”, and “Implementation strategies in the clinic”. It has been known that a large number of genetic alterations present in the human tumor cells. However, it is difficult to discriminate between genes that are critical for maintaining the disease state and genes those are merely coincidental. In last decade, the array-based technologies revolutionized the understanding of breast cancer biology and thereby considerably improved therapeutic strategies. Since the information presented in the article is already published in a number of review articles, it would have been most appropriate if authors describe the “clear objective” of this review article.

Specific Comments:

1. This is a well written article.

2. Authors rightly pointed out that examining only the gene copy number (change) is not adequate to answer questions related to the design of the therapy; mutational analysis also play an indispensable role in deciding the treatment strategy.

3. In “Molecular classification of breast cancer”, authors have informed about the diversity of breast cancer and the role of technical advances in the understanding of the extent of molecular heterogeneity of breast cancer. However, the three paragraphs under “Molecular classification of breast cancer” are not seamlessly connected.

4. The gene array literature is polluted with many gene expression signatures that have inadequate validation (see the article of Serge Koscielny, Science Translational Medicine January 2010). In light of the above fact, authors should emphasize on the validation issue.

5. It has been known that genetically simple isogenic systems can be very powerful in identifying the prime determinants of response to particular therapeutic approach (Farmer H et al Nature 2005 434:917). Authors should discuss about isogenic systems in their review.

6. Authors mentioned “Fusion genes” but did not mention what is it? It will be easy for the reader to have a short description of “Fusion genes” and what is the relevance of “Fusion genes” in the context of the review.
7. A reader will also appreciate a “conclusion/future direction” at the end of the review.

Consider for acceptance following the revision.

**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'