Reviewer's report

Title: Expression of the embryonic stem cell marker SOX2 in early-stage breast carcinoma

Version: 1 Date: 3 December 2010

Reviewer: Hans H. Kreipe

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Lengerke and colleagues have studied a series of breast cancers for the expression of SOX2, which functions as a transcription factor and is essential to maintain self-renewal of undifferentiated embryonic stem cells. Previous reports have linked the expression to the basal phenotype of breast cancer. Because up to now only one larger study to assess expression of SOX2 in human breast cancer has been published the paper is of potential interest.

Major comments:

• The inclusion criteria for cases entered into the study are not clear and should be described
• Was amplification also excluded by FISH in the 4 strongly positive lymphnode metastases?
• It would be interesting to see whether a correlation occurred when expression of basal cytokeratins (5/6 and EGFR) were taken into account to establish a basal phenotype as done by Rodriguez-Pinilla and co-workers
• 18 cases were studied for mRNA expression of SOX2. Why did the authors not correlate mRNA expression data with those derived from immunohistochemistry, e.g. the score in use?
• A correlation was found between lymphnode metastasis and SOX2 but not with other prognostic markers such as grading, ER and PR, triple negativity. In order to get a better impression whether the series is representative, it would be helpful when the authors could indicate whether a correlation existed between lymph node status and these established markers.

Minor comments:

• In table 2 subtypes of breast cancer are indicated. How were luminal A and luminal B types of breast cancer defined?

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

Quality of written English: Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.