Claims

1. An *in vitro* method for the prognosis of overall breast cancer survival, breast cancer recurrence or response to HER2 antagonist treatment for a patient suffering from breast cancer, the method comprising:

(a) examining a breast cancer tissue sample from the patient to determine whether the patient is human epidermal growth factor receptor 2 (HER2) positive having an IHC score of positive 2, or a FISH score of greater than 4, or a FISH HER2:CEP17 ratio score of greater than 2 or HER2 negative having an IHC a score between 0 and positive 1 or a FISH score of less than 4 or a FISH HER2:CEP17 ratio score of less than 2; and

(b) measuring WW domain-binding protein 2 (WBP2) levels in the patient's breast cancer tissue sample,

wherein a result in step (a) and a result in step (b) are compared to a set of predetermined expression level results from a comparison population wherein the predetermined expression level of WBP2 is an IHC score of 1, and wherein the comparison population is stratified into a plurality of four subgroups determining the aggressiveness of a breast cancer and provides a prognosis of overall breast cancer survival, breast cancer recurrence or response to treatment for the patient, the subgroups comprising:

(i) a reference group of HER2 negative patients comprising WBP2 expression below a predetermined level;

(ii) a group of HER2 negative patients comprising WBP2 expression above a predetermined level;

(iii) a group of HER2 positive patients comprising WBP2 expression below a predetermined level; or

(iv) a group of HER2 positive patients comprising WBP2 expression above a predetermined level.

2. The method of claim 1, wherein each subgroup (ii) to (iv) is referenced from the reference group (i).

3. The method of claim 2, wherein a sample with WBP2 expression levels above the predetermined level and a HER2 positive patient provides the prognosis that the patient has an approximate 4 to 5 times lower chance of overall survival compared to the reference group.

4. The method of claim 2, wherein a sample with WBP2 expression levels below the predetermined level and a HER2 positive patient provides the prognosis that the patient has an approximate 1 to 2 times lower chance of overall survival compared to the reference group.

5. The method of claim 2, wherein a sample with WBP2 expression levels above the predetermined level and a HER2 negative patient provides the prognosis that the patient has an approximate 2 to 3 times lower chance of overall survival compared to the reference group.

6. The method of claim 2, wherein a sample with WBP2 expression levels above the predetermined level and a HER2 positive patient provides the prognosis that the patient has an approximate 2 to 3 times higher chance of cancer recurrence compared to the reference group.

7. The method of claim 2, wherein a sample with WBP2 expression levels below the predetermined level and a HER2 positive patient provides the prognosis that the patient has an approximate 1 times higher chance of cancer recurrence compared to the reference group.

8. The method of claim 2, wherein a sample with WBP2 expression levels above the predetermined level and a HER2 negative patient provides the prognosis that the patient has an approximate 1 to 2 times higher chance of cancer recurrence compared to the reference group.

9. The method of claim 1 or 2, wherein a sample with WBP2 expression level above the predetermined level and a HER2 positive result predicts that the patient is likely to respond to treatment.

10. The method of claim 1 or 2, wherein a sample with WBP2 expression level below the predetermined level and a HER2 positive result predicts that the patient is less likely to respond to treatment.

11. The method of claim 1, wherein the HER2 antagonist comprises Herceptin (Trastuzumab), Pertuzumab, Lapatinib, Lapatinib in combination with capecitabine, Trastuzumab emtansin, Ado-trastuzumab, Neratinib, or Dasatinib.

12. The method of any one of the preceding claims, wherein the WBP2 levels in the patient's sample are measured with at least one probe adapted to target a WBP2 protein.

13. The method of claim 12, wherein the probe is an antibody.

14. The method of claim 12, wherein the probe is an aptamer.

15. The method of claim 12, wherein the probe is a peptide.