

Risk classification of Early Stage Breast Cancer as Assessed by MammaPrint and Oncotype DX Genomic Assays

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Background: The 21-gene Oncotype DX® Recurrence Score® assay has been validated for prediction of 10-year risk of distant recurrence and likelihood of benefit from chemotherapy (CT) in patients (Pts) with estrogen receptor-positive (ER+) early stage breast cancer (ESBC). MammaPrint® is a multi-gene assay that has been validated as a prognosticator in a heterogeneous Pt population that includes ER+, ER-, triple negative and HER2+ Pts. While the development and validation cohorts for these genomic assays are significantly different, the tests are frequently believed to provide equivalent information. The aim of the present study was to assess how these tests classify patients when compared side by side in the same Pt specimen.

Materials and methods: Pts with ER+, HER2-, ESBC in which the MammaPrint assay had been sent were identified at the Institut du Sein, Paris, France. Clinical and pathological characteristics and the MammaPrint results (failure, low or high risk) were collected. Oncotype DX quantitative RT-PCR analysis was performed at Genomic Health and was blinded to the clinical and MammaPrint data. Descriptive statistics were calculated for failure rates, cross classification, and tumor characteristics.

Results: Informed consent and sufficient tumor material for analysis was available from 67 Pts who were predominantly low and intermediate risk by clinicopathologic features: Tumor grade- 24 low, 36 intermediate and 7 high; Histology- 49 ductal, 14 lobular and 4 other. MammaPrint analysis had failed to deliver result for 10 of the 67 Pts. Recurrence Score results were generated in all 67 Pts. The risk classification of the MammaPrint and Oncotype DX tests in the 57 patients where both results were available is presented in the Table below. Of note, there were only 2 high Recurrence Score results compared with 22 high risk MammaPrint results. Furthermore, 45% of the Pts with high risk MammaPrint result had a low Recurrence Score result; they also had high quantitative ER expression of more than 9.5 expression units by RT-PCR, which is associated with likely hormonal therapy benefit. There was no clear association between tumor characteristics and MammaPrint failure or differences in risk classification.

Conclusions: This direct comparison demonstrates that the MammaPrint and Oncotype DX tests classify a large proportion of Pts differently. Of note, nearly half of the Pts with high risk MammaPrint result had a low Recurrence Score indicating minimal, if any, benefit from chemotherapy.

	MammaPrint		
	Low risk	High risk	Total
Low RS	23 (65%)	10 (45%)	33 (58%)
Intermediate RS	11 (31%)	11 (50%)	22 (39%)
High RS	1 (3%)	1 (5%)	2 (4%)
Total	35 (100%)	22 (100%)	57 (100%)