The aim of this study was to independently validate a genomic signature developed both to assess recurrence risk in stage II patients and to assist in treatment decisions. Adjuvant therapy is recommended for high-risk patients with stage II colon cancer, but better tools to assess the patients' prognosis accurately are still required. Previously, an 18-gene signature had been developed and validated on an independent cohort, using full genome microarrays. In this study, the gene signature was translated and validated as a robust diagnostic test (ColoPrint), using customized 8-pack arrays. In addition, clinical validation of the diagnostic ColoPrint assay was performed on 135 patients who underwent curative resection (R0) for colon cancer stage II in Munich. Fresh-frozen tissue, microsatellite instability status, clinical parameters, and follow-up data for all patients were available. The diagnostic ColoPrint readout was determined blindly from the clinical data. ColoPrint identified most stage II patients (73.3%) as at low risk. The 5-year distant-metastasis free survival was 94.9% for low-risk patients and 80.6% for high-risk patients. In multivariable analysis, ColoPrint was the only significant parameter to predict the development of distant metastasis with a hazard ratio of 4.28 (95% confidence interval, 1.36-13.50; P = 0.013). Clinical risk
parameters from the American Society of Clinical Oncology (ASCO) recommendation did not add power to the ColoPrint classification. Technical validation of ColoPrint confirmed stability and reproducibility of the diagnostic platform. ColoPrint is able to predict the development of distant metastasis of patients with stage II colon cancer and facilitates the identification of patients who may be safely managed without chemotherapy.