The cell cycle progression (CCP) score has proven to have prognostic utility in predicting disease progression in various clinical settings utilizing biopsy, TURP and post prostatectomy specimens.

Previous studies evaluating post−surgical outcomes were conducted using CCP gene expression measured in the prostatic specimens. Here, we demonstrate the ability of the CCP score to predict cancer progression, as measured by both BCR and metastatic disease after radical prostatectomy, using needle biopsy tissue.

We evaluated the CCP score in three patient cohorts:

- Martin Clinic in Hamburg Germany (MC, N=283) - Diagnosed from 2005 and 2006
- Simulated biopsy from FFPE tumor block
- Durham VA Medical Center (DVA, N=176) - Diagnosed from 1992 to 2001
- Durham VA Medical Center (DVA, N=176) - Diagnosed from 1992 to 2001 –Selected cohort (36 with BCR, 87 with no recurrence)

The CCP score was derived from a simulated biopsy (MC) or diagnostic biopsy (DVA and IHC), and evaluated for association with biochemical recurrence (BCR) and metastatic disease in univariable analysis and after adjusting for other clinical information.

In all three cohorts, the CCP score was associated with BCR and metastatic disease. The association with the BCR remained significant after adjusting for other prognostic clinical variables.

In a combined analysis of all three cohorts (N=582), the CCP score was a strong predictor of BCR in both univariable (HR Intertarquile Range (IQR) = 1.68 (95%CI: 1.41, 1.99), p−value < 10−5) and multivariable analyses (HR per IQR = 1.53 (95%CI: 1.28, 1.84), p−value < 10−5). The CCP score was the strongest predictor of metastatic disease in both univariable analysis (HR per IQR = 6.32 (95% CI: 3.41, 11.71), p−value < 10−5) and after adjusting for clinical variables (HR per IQR = 4.83 (95% CI: 2.40, 9.74), p−value < 10−5).

The association with BCR remained significant after adjusting for other clinical variables.

As a combined analysis of all three cohorts (N=582), the CCP score was the strongest predictor of eventual metastatic disease of the tested variables including Gleason and PSA.

These results indicate that the CCP score can be used at disease diagnosis to better define patient prognosis and appropriate clinical care.