

# Analysis of the serial circulating tumor cell count during neoadjuvant chemotherapy in breast cancer patients

- Journal : Scientific Report (IF: 3.8)
- Date : October 2020.
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**Study Aim:** To evaluate the prognostic implications of circulating tumor cell (CTC) counts in non-metastatic, HER2-negative breast cancer patients who failed to achieve pathologic complete response (pCR) after neoadjuvant chemotherapy (NCT).

## Methods:

- Study population: 147 HER2-negative breast cancer patients (107 hormone receptor-positive, 40 triple-negative)
- CTC isolation and counting before and after NCT using a SMART BIOPSY SYSTEM isolation kit
- Analysis of pathological complete response (pCR), relapse-free survival (RFS), and overall survival (OS)
- Statistical analysis including Kaplan-Meier method and Cox regression analysis

## Key Findings:

- CTCs detected in 59.9% of patients before NCT and 52.4% after NCT
- In the entire cohort, nodal status and hormone receptor status were significant prognostic factors for RFS and OS
- In TNBC patients who failed to achieve pCR:
  - $\geq 5$  CTCs after NCT associated with worse RFS (HR 10.66) and OS (HR 14.00)
- In ER-positive, HER2-negative subgroup, only nodal status was relevant to RFS
- CTC count alone was not associated with age, tumor size, nodal status, cancer subtype, or achievement of pCR

## Conclusions:

- Patients with residual tumor and high CTC counts after NCT showed worse outcomes, particularly in TNBC
- CTC count may be a useful prognostic biomarker, especially in TNBC patients who fail to achieve pCR
- Further studies with longer follow-up and validated methods are needed to confirm the clinical utility of CTC analysis in non-metastatic breast cancer
- The findings could justify future trials to obtain regulatory approval for clinical use of the assay, especially for ER-positive, HER2-negative breast cancer patients

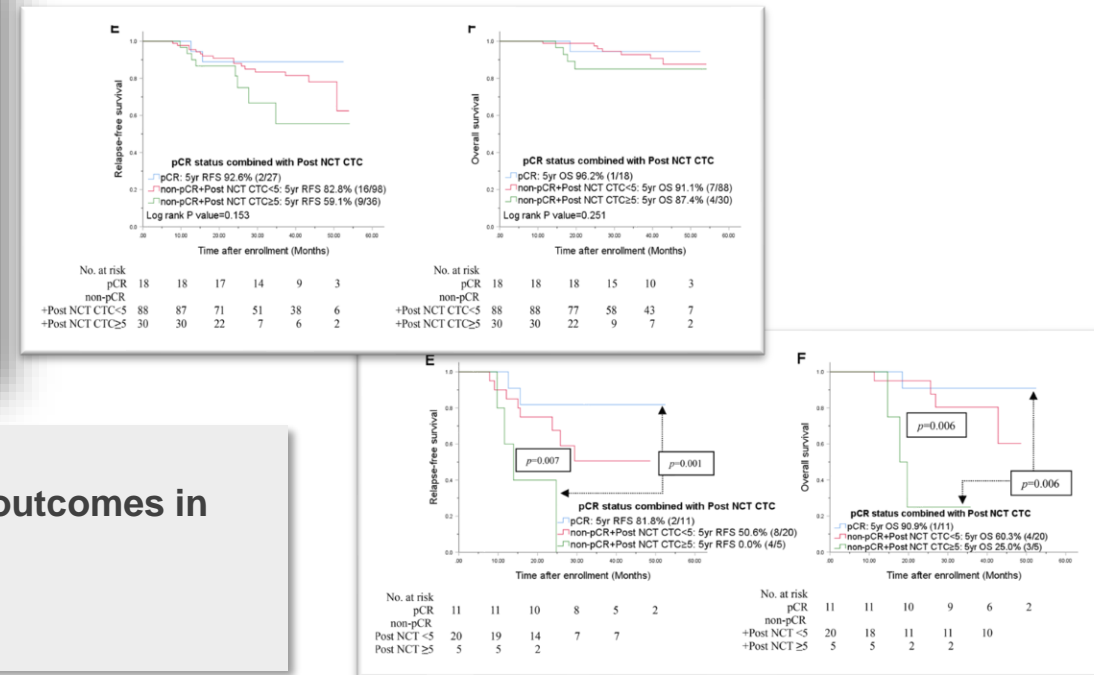
The study suggests that CTC counts, particularly after NCT, could be a valuable tool for predicting prognosis and potentially guiding treatment decisions in non-metastatic breast cancer patients, especially those with TNBC.

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### Using CTC count for analyzing survival rate



- Study of CTC count in breast cancer patients
- Analysis of relationship between CTC counts and survival outcomes in HER2-negative or TNBC Patient Populations
- RFS and OS related to the CTC count
- Evaluation of the prognostic implications of CTC count

**Suggest CTC count as a valuable prognostic marker**

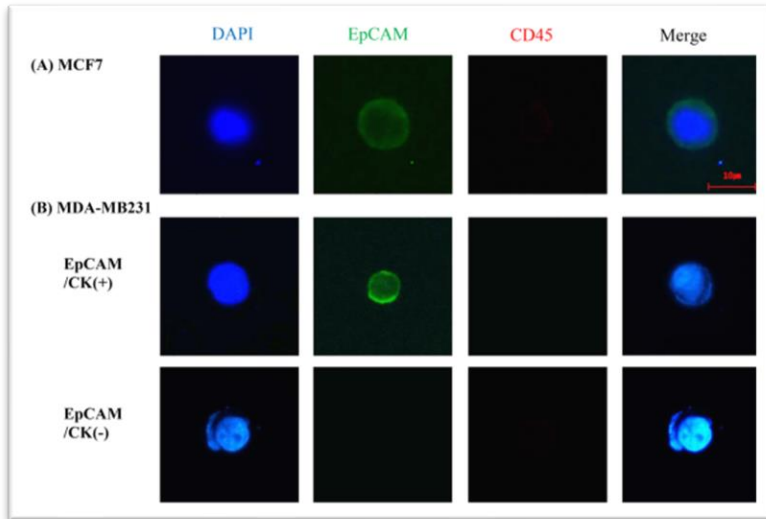
*The research conducted by Professor Jisun Kim at Seoul Asan Medical Center is exploring the correlation between the number of CTCs and prognostic evaluation in breast cancer patients using CytoGen's platform.*



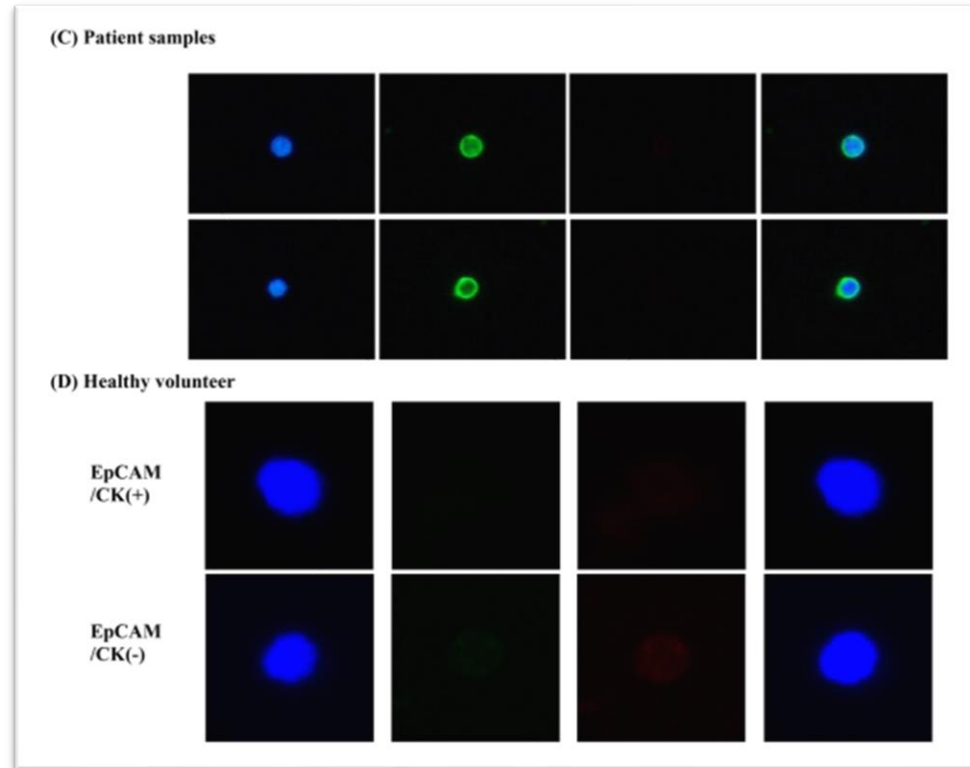
# Analysis of the serial circulating tumor cell count during neoadjuvant chemotherapy in breast cancer patients

- Using CytoGen's Image Analyzer for CTC detection

## Immunofluorescence image of CTC in cell lines



## Immunofluorescence image of CTC in patients



CTC count can be measured using IF analysis. Proposes the potential use of CTC as a clinical prognostic marker.