

# Diagnostic Non-Invasive Biopsy CanSubstitute Conventional Tissue Dependent Procedures in Suspected Cases of Renal Cell Carcinoma

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**Conflict of Interest :**  
Datar Cancer Genetics Limited offers commercial services in the domain of oncology.

## BACKGROUND

- Diagnosis of RCC is based on HPE of tumor tissue obtained by invasive biopsies, which are associated with pain, bleeding and other procedural risks,
- There are presently no sensitive non-invasive means for diagnosis of RCC - low yields of Circulating Tumor Cells (CTC) restrict meaningful investigations,
- We have developed a blood based liquid biopsy diagnosis for RCC based on immunocytochemistry (ICC) of Circulating Tumor Associated Cells (C-TACs).

## RATIONALE

- We used an epigenetically activated medium that is cytotoxic towards normal cells (PBMCs) which have an intact apoptotic machinery, but confers survival privilege on apoptosis resistant cells of tumorigenic origin (Circulating Tumor Associated Cells: C-TACs),
- C-TACs (EpCAM<sup>+</sup>,CK<sup>+</sup>,CD45<sup>±</sup>) are identified by immunocytochemistry (ICC).

## APPROACH

- 15 ml blood obtained from 133 confirmed RCC cases and 1050 asymptomatic individuals,
- C-TACs enriched and harvested from PBMCs and identified by ICC,
- Deep ICC profiling of C-TACs was performed with RCC- and subtype specific markers.

Table 1. Age	RCC	Healthy	Table 2. Metastases	RCC
Minimum	16	40	Metastatic	71
Maximum	88	77	Non-metastatic	39
Median	58	54	Unavailable	23

Table 3. Therapy	RCC	Table 4. Imaging	RCC
Pre-treated	69	Detectable Disease	120
Treatment Naive	55	NED	13
Unavailable	9	Unavailable	-

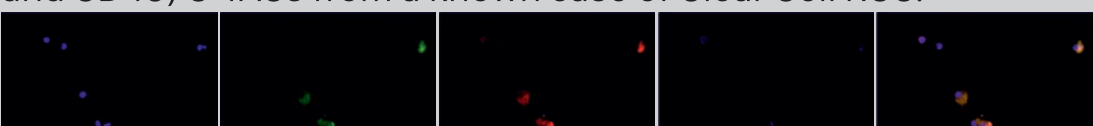
## IDENTIFICATION OF C-TACs BY IMMUNOCYTOCHEMISTRY (ICC)

Fig 1. Representative images of immunostained (EpCAM, panCK and CD45) C-TACs from a known case of Clear Cell RCC.



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## DEEP ICC PROFILING C-TACs FOR ORGAN SPECIFICITY

Fig 2. Representative images of C-TACs from a known case of Clear Cell RCC immunostained for PAX-8 (Positive in Clear Cell, Papillary and Chromophobe).

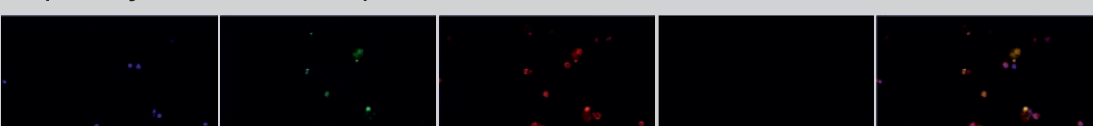


Fig 3. Representative images of C-TACs from a known case of Clear Cell RCC immunostained for CA-IX (Negative in Papillary and Chromophobe).



Fig 4. Representative images of C-TACs from a known case of High Grade Clear Cell RCC immunostained for Vimentin (Negative in Papillary and Chromophobe).

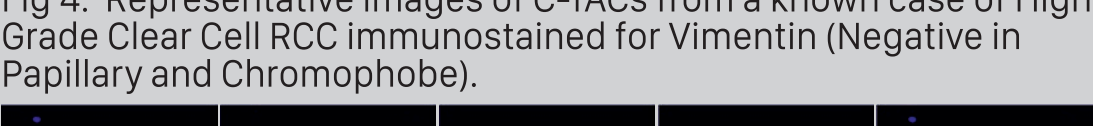
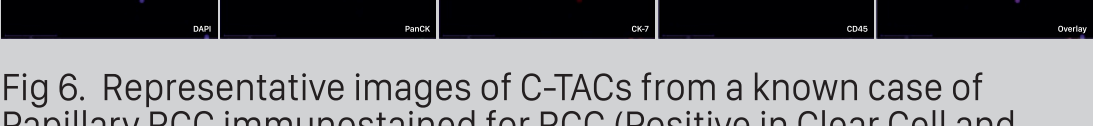


Fig 5. Representative images of C-TACs from a known case of Papillary RCC immunostained for CK-7 (Negative in Clear Cell and Chromophobe).



Fig 6. Representative images of C-TACs from a known case of Papillary RCC immunostained for RCC (Positive in Clear Cell and Papillary, Negative in Chromophobe).



## FINDINGS

- C-TACs obtained in 133 samples out of 133 (100%).
- Organ specificity could be determined in 75 / 75 samples.
- C-TACs were detected in 12 /1050 asymptomatic individuals.
- C-TACs in asymptomatic individuals were negative for RCC-specific markers.

## CONCLUSION

Non-invasive (blood based) ICC profiling of C-TACs can provide necessary diagnostic information for RCC and can substitute conventional procedures dependent on tissue extraction.