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Introduction & Objectives: Renal Cell Carcinoma (RCC) diagnosis involves invasive biopsies for definitive diagnosis which are frequently non-representative and hence have an alarmingly false negative rate of up to 37 %. Additionally, there are considerable risks associated with invasive procedures including bleeding, pain and Arteriovenous fistula. We present here for the first time a blood based non-invasive biopsy utilizing a Circulating Tumor Associated Cell (C-TAC) Assay that enables efficient immunofluorescent interrogation for diagnosis of RCC.

Materials & Methods: We obtained 15 ml of venous blood draw from 133 known patients of RCC, [101 (76%) male, 32 (24%) female] and 1050 asymptomatic individuals [630 (60%) male, 420 (40%) female]. C-TACs were enriched by paradoxical cytotoxic processing and characterized for cancer (EPCAM, PanCK) and Kidney specific antigens (PAX8 and CK7) by immunocytochemistry (ICC).

Results: C-TACs (EPCAM and CK positive) could be obtained from 133 samples out of 133 (100%). Among the 75 samples that were characterised by staining for organ specific antigens, 100% samples were positive for CK7 and PAX8. 12 samples from asymptomatic individuals tested positive for presence of C-TACs but were negative for CK7 and PAX8.

Conclusions: Our results show that ICC based characterization of C-TACs can provide necessary diagnostic information non-invasively to substitute conventional procedures dependent on tissue extraction for diagnosis of RCC.