

## **(MP80-01) Radioproteomic Analysis as a Potential Predictor of Renal Tumor Histopathology**

Jorge Daza<sup>1</sup>, Berengere Salome<sup>2</sup>, Octavia Bane<sup>3</sup>, Sara Lewis<sup>3</sup>, John P. Sfakianos<sup>1</sup>, Andrew Charap<sup>1</sup>, Kirolos Meilika<sup>1</sup>, Bheesham Dayal<sup>1</sup>, Kennedy Okhawere<sup>1</sup>, Daniela Said<sup>3</sup>, Stefanie Hectors<sup>3</sup>, Nihal Mohammed<sup>1</sup>,  
Natasha Kyprianou<sup>1</sup>, Ketan Badani<sup>1</sup> & Amir Horowitz<sup>2</sup>

<sup>1</sup>Department of Urology, Icahn School of Medicine at Mount Sinai, New York, NY, 10029

<sup>2</sup>Department of Oncological Sciences, Icahn School of Medicine at Mount Sinai, New York, 10029

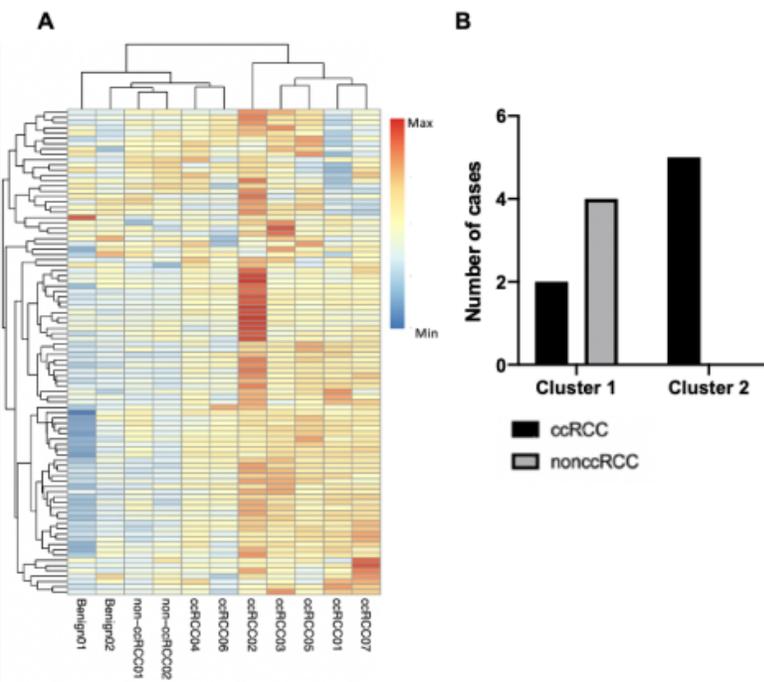
<sup>3</sup>Department of Diagnostic, Molecular and Interventional Radiology, , Icahn School of Medicine at Mount Sinai, New York, NY, 10029

**Objective** To evaluate the role of serum and urine inflammatory biomarkers to identify histological subtypes and disparities in anti-tumor immune response in ccRCC versus non-ccRCC cases . We also sought to assess the potential role of mpMRI to predict the systemic and local anti-tumor immune response against ccRCC and non-ccRCC tumors.

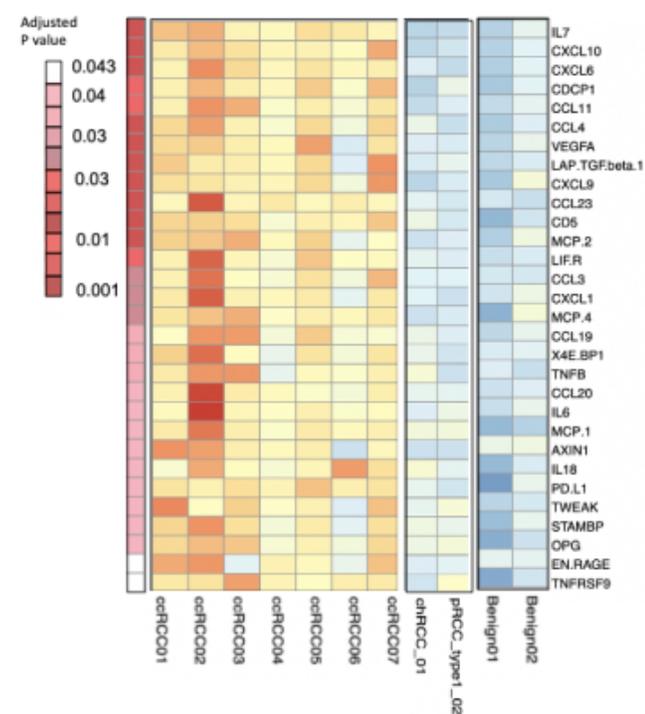
**Approach.** Inflammation-related proteins were detected thorough matched pair antibodies, coupled to unique, partially complementary oligonucleotides, and measured by qualitative real-time PCR. Multiparametric MRIs were done during the preoperative evaluation. Apparent diffusion coefficient (ADC), Diffusion-coefficient (D) and Perfusion-fraction (PF) were calculated DWI sequences

## **Results.**

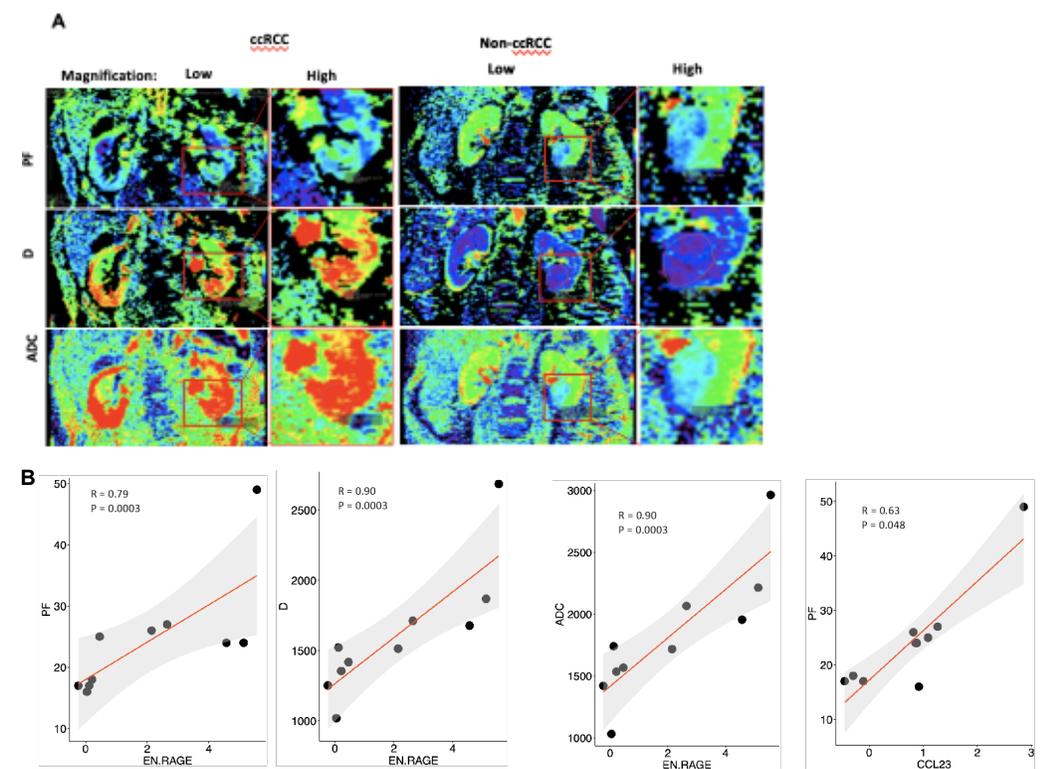
- (1) We demonstrated the presence of 2 clusters of inflammation-related biomarkers in urine.
- (2) Analyses on these identified clusters revealed a significant differential expression of 30 proteins between clusters 1 and 2.
- (3) Multiparametric MRI coefficients significantly correlated with the expression levels of pro-inflammatory markers that showed significant differential expression in our previous analyses.
- (4) Inflammation-related markers analysis in serum did not reveal any significant clusters that could distinguish between histological subtypes.



**Fig.1. Unsupervised clustering analysis in urine inflammation-related markers** **A)** Clusters 1 (Non-Inflammatory) and 2 (Inflammatory) were defined **B)** Bar graph showing significant higher number of ccRCC and non-ccRCC cases in clusters 1 and 2 ( $p = 0.0455$ )



**Fig.2. Differential protein expression analysis between described clusters 1 and 2.** We observed significant upregulation of inflammatory vs non-Inflammatory proteins in samples from ccRCC patients compared to RCC cases.



**Fig.3 Correlative analysis of mpMRI radiomics and Olink proteomics reveals a ccRCC signature associated with inflammation and mpMRI coefficients** **A).** ccRCC (left) and non-ccRCC (right) representative pictures with higher PF, D and ADC coefficients in ccRCC compare to non-ccRCC. **B)** Significant positive correlation was found between EN.RAGE, and ADC, PF and D. PF also had a significant strong correlation with CCL23.