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Liquid biopsy in *clear cell* Renal Cell Carcinoma: urinary miR-210-3p as emerging specific biomarker

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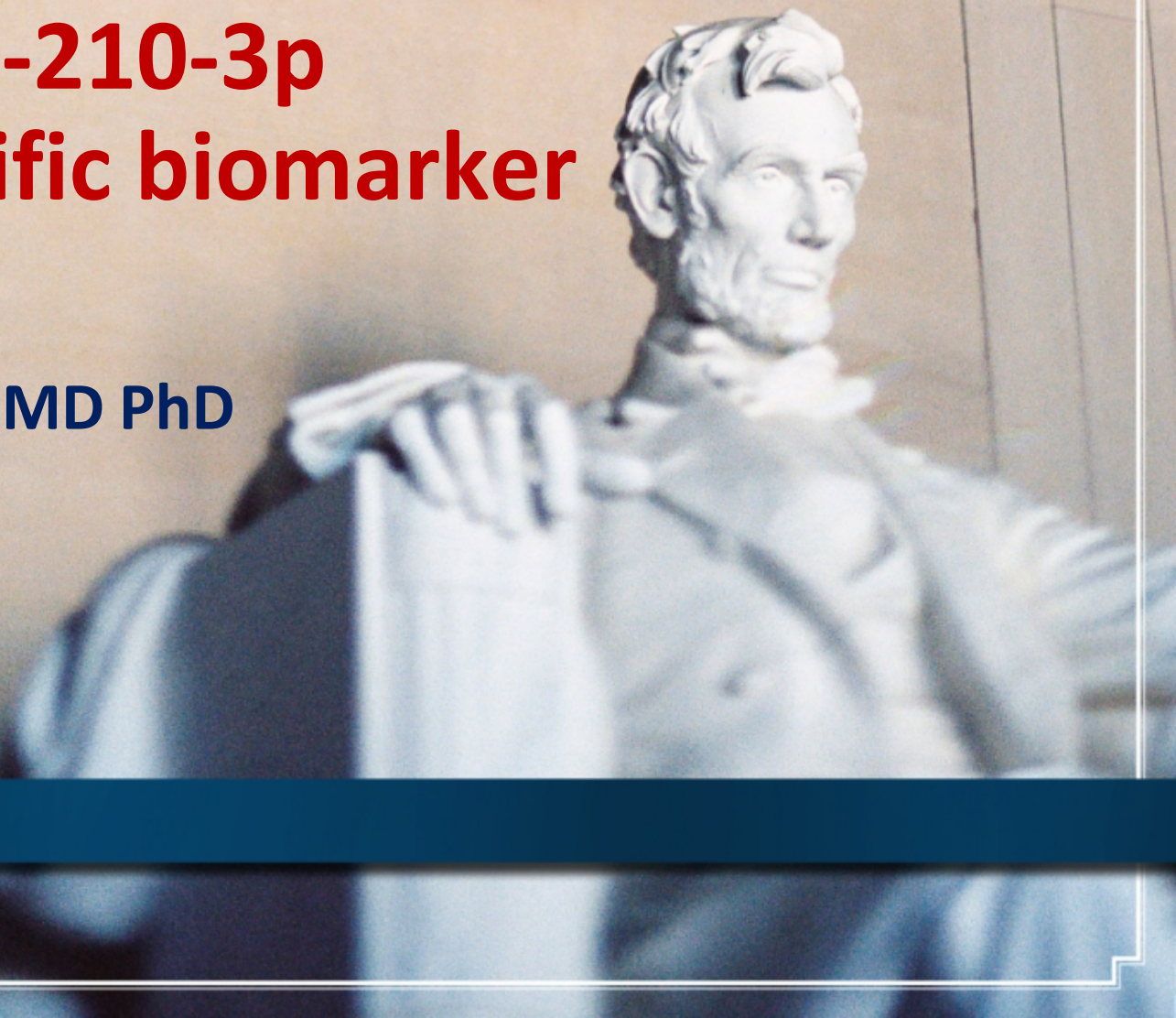

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Background: clear cell RCC (ccRCC) account for 70-80% of all renal malignancies. To date, no useful markers are available in clinical practice for early diagnosis and for optimal patient stratification. MicroRNAs, a class of small non-coding RNA, are emerging as promising molecules in the management of urological tumors suggesting the possibility of using them as non-invasive biomarkers.

Objective: to evaluate whether miR-210-3p may be an accurate non invasive diagnostic and prognostic biomarker for ccRCC patients.

Material and methods: 21 ccRCC cases underwent radical or partial nephrectomy at Regina Elena National Cancer Institute of Rome. RTqPCR analysis of miR-210-3p levels in neoplastic and healthy tissues and in urine specimens collected at surgery and during follow-up visits (from 3 to 24 months)

- 18 disease-free patients and a small subgroup presenting metastatic progression (bone, lung, bowel)
- Urine samples were collected from 16 healthy donors with similar demographic features
- The specimens were frozen within 30 minutes from collection and stored at -80°C until RNA extraction and microRNA expression analysis.

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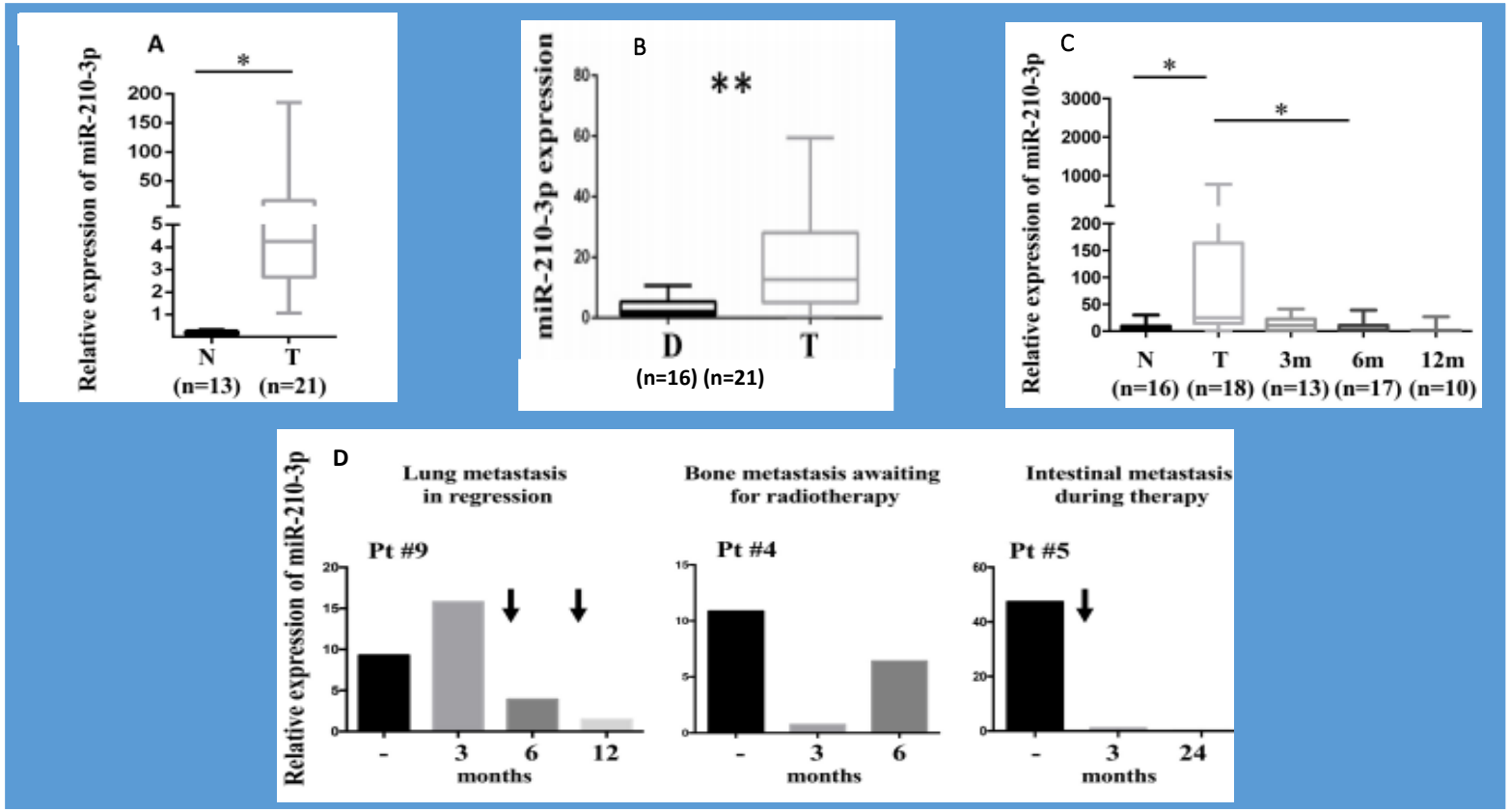
Results:

- miR-210-3p was upregulated in ccRCC fresh frozen tissues compared to matched normal counterparts (Fig A)
- miR-210-3p resulted significantly up-regulated in urine specimens collected from ccRCC patients at the time of surgery, compared to healthy samples (Fig B)
- miR-210-3p levels resulted significantly reduced in urine samples from disease-free patients during follow-up, compared to the baseline levels (time of surgery)(Fig C)
- In metastatic patients the urine levels of miR-210-3p increased and, interestingly, again decreased when responding to medical treatments. (Fig D)



Conclusions: **This pilot study highlights the relevance of secreted miR-210-3p as powerful non invasive diagnostic and prognostic biomarker for ccRCC patients, with potential clinical applications from diagnosis to treatment**

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