

# POSSIBLE ROLE OF miRNAs IN OBSTRUCTIVE NEPHROPATHY

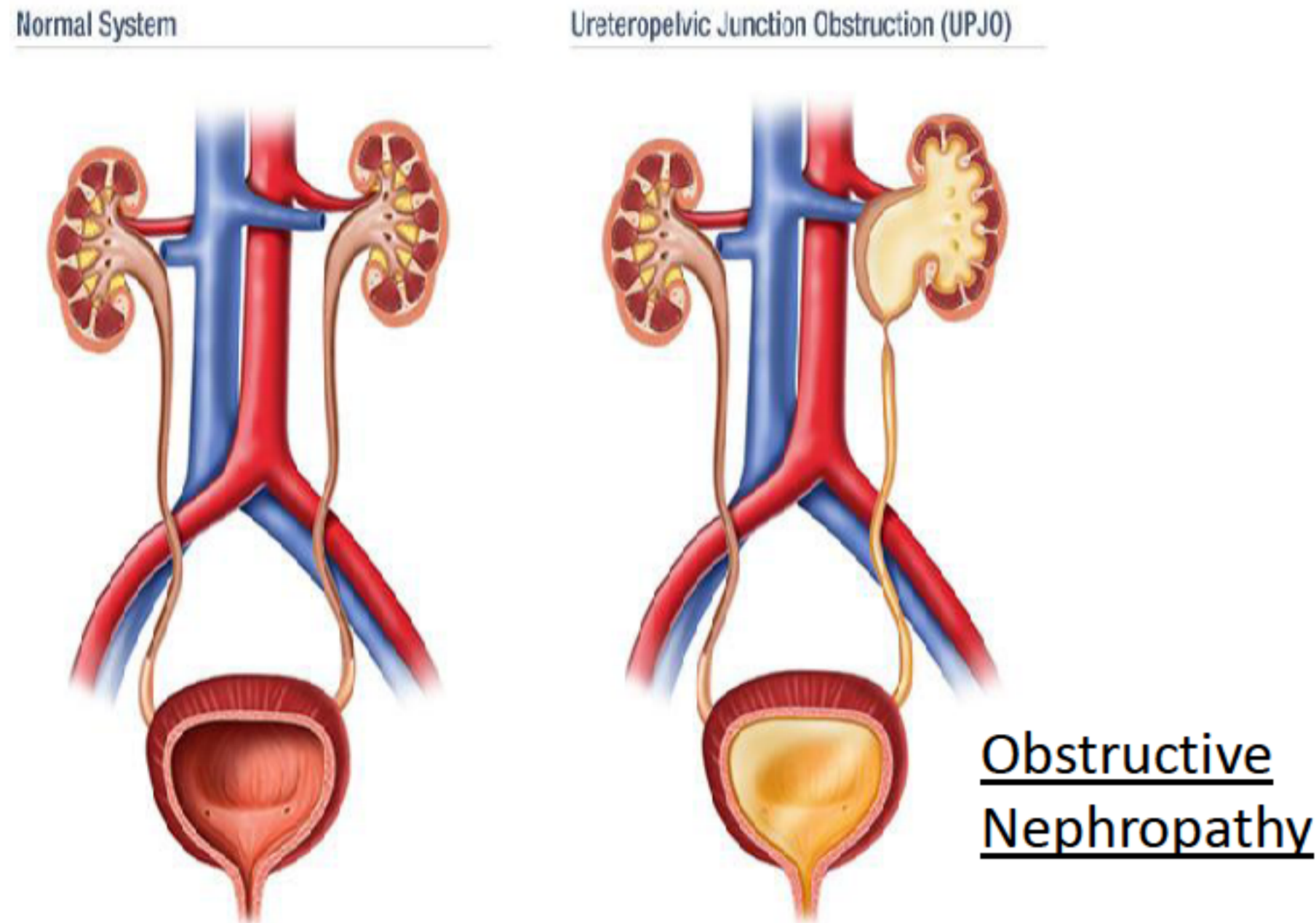
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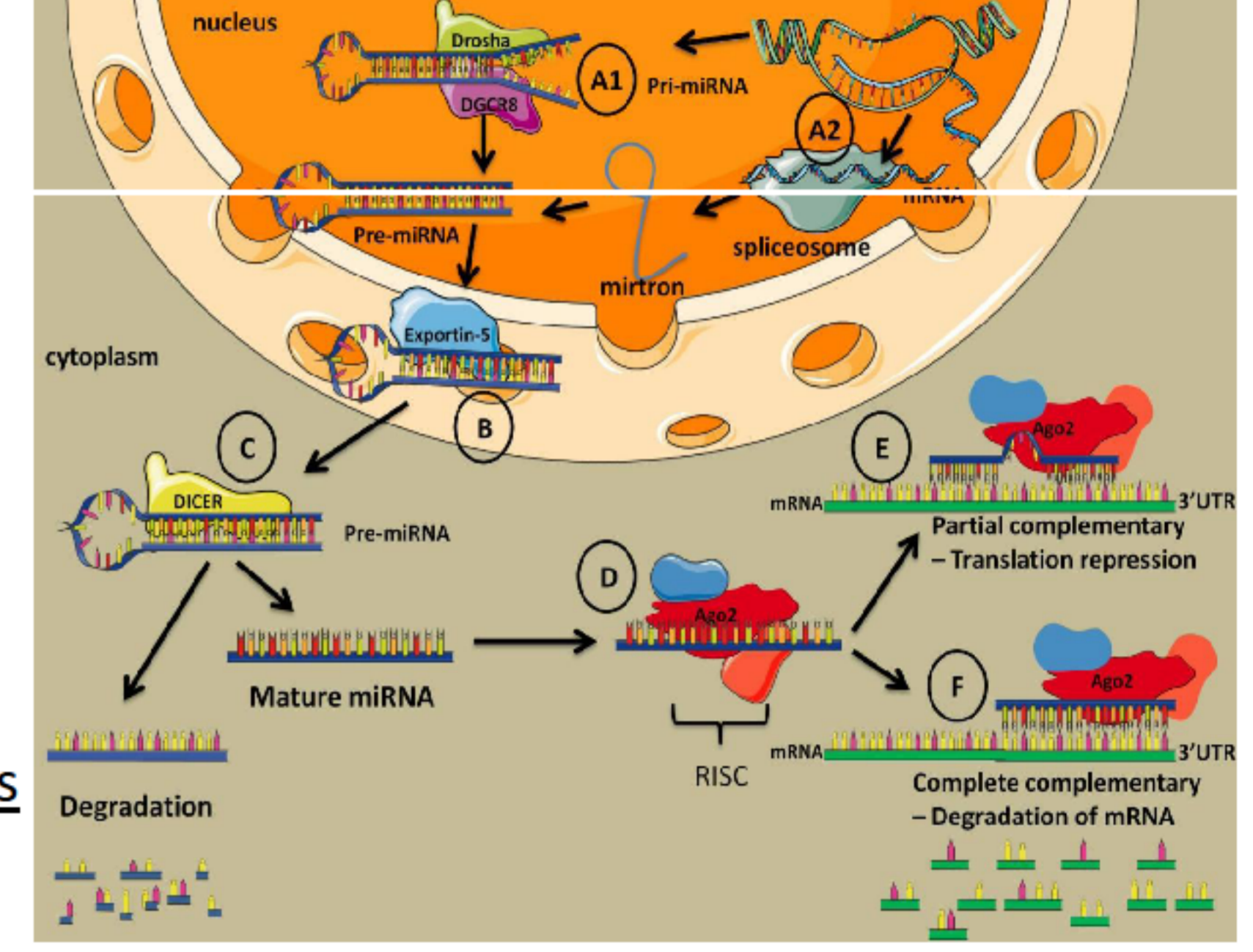
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## Introduction – Objectives

miRNAs are small non coding RNA molecules (21 – 25 nucleotides) and their function is to control gene expression! Obstructive nephropathy (ON) can cause hydronephrosis which, if not treated fast and efficient, may lead to kidney failure. ON is frequently observed in infants. Its pathophysiological features involve fibrosis, inflammation, glomerular and tubular damage. Severe ON may lead to CKD in the long term.<sup>2</sup>

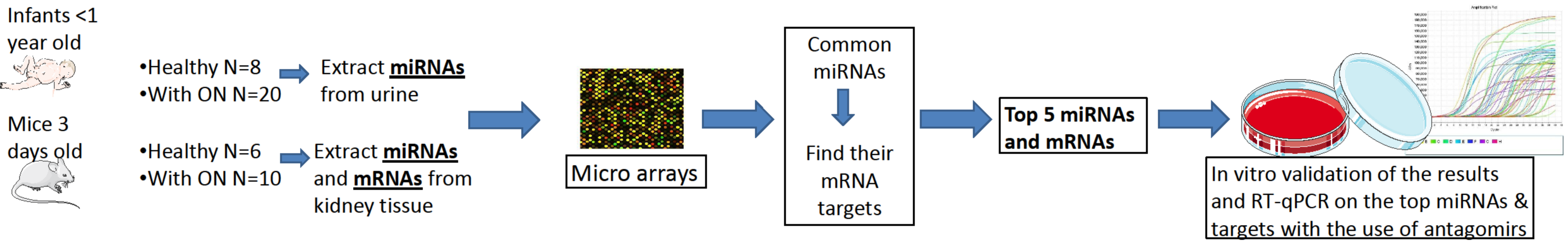


**Aim of the study**  
Combining mouse miRNA and mRNA (tissue) and human miRNA (urine) to obtain improved insight in obstructive nephropathy.



miRNAs biogenesis and function<sup>1</sup>

## Workflow of the project

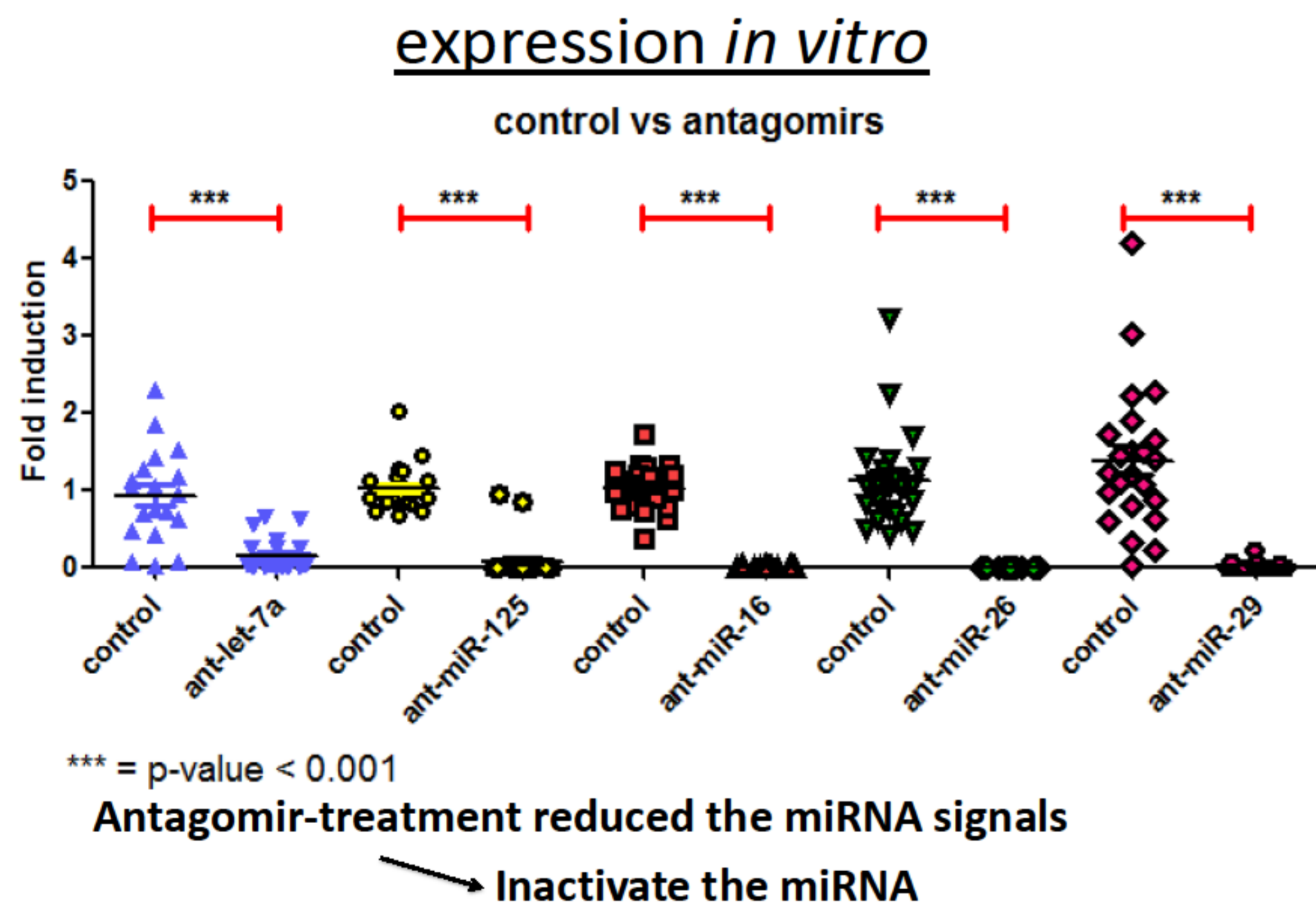


## Results

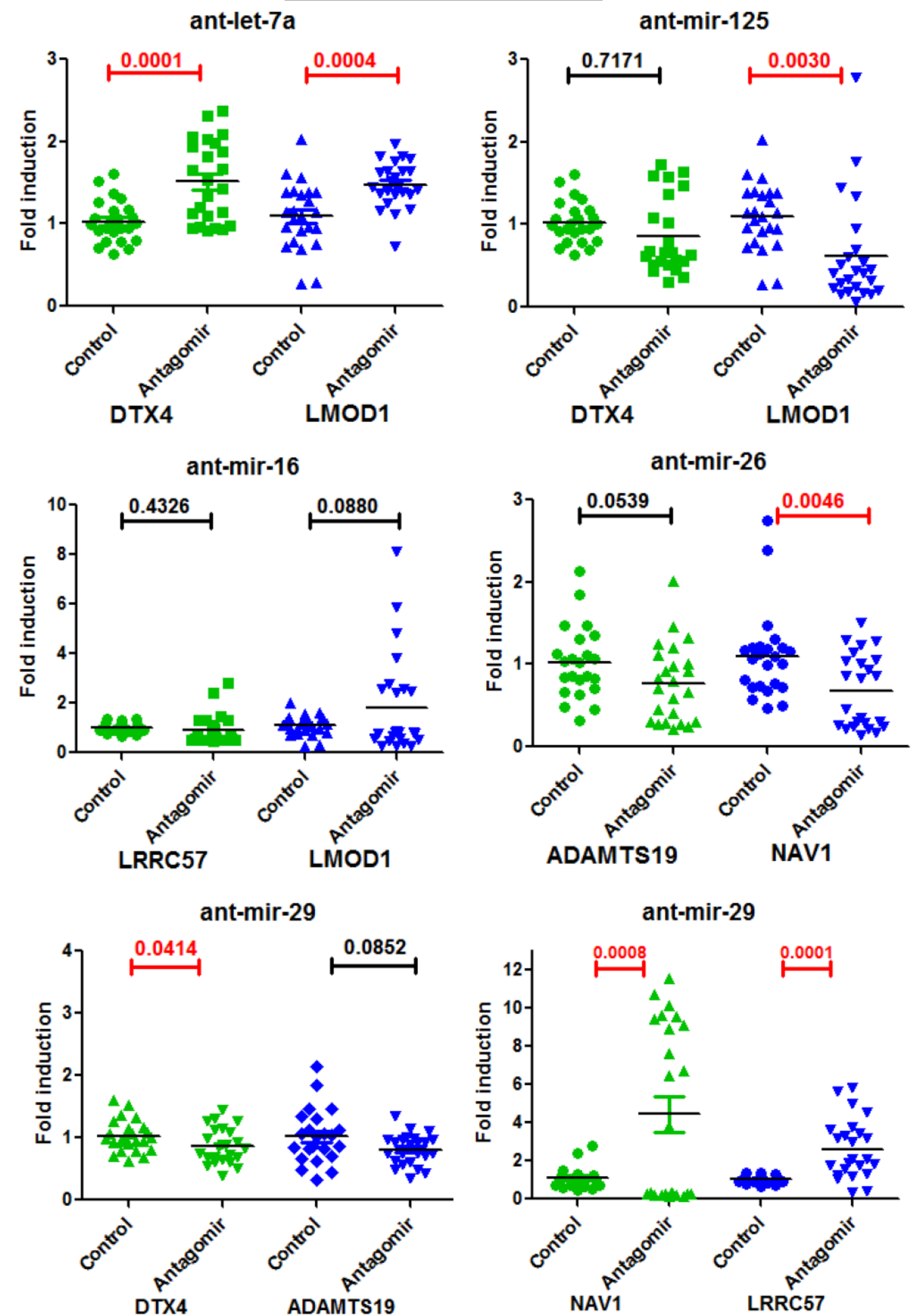
### miRNAs and their predicted targets

miRNA	let-7a-5p	miR-125b-5p	miR-16-5p	miR-26a-5p	miR-29b-3p
mRNA predicted	DTX4, LMOD1	DTX4, LMOD1	LMOD1, LRRC58	ADAMTS19, NAV1	DTX4, ADAMTS19, LRRC58, NAV1

### Effect of antagonism treatment on miRNA expression *in vitro*



### Effect of antagonism treatment on mRNA expression *in vitro*



## Conclusions

- Antagonism for let-7a-5p showed the most clear effect on the target mRNAs.
- LRRC57 may be also considered as a possible target for miR-29b.
- Blocking miR-125b and miR-26a resulted downregulation of the predicted targets → an opposite outcome according to biology.
- Focus on let-7a-5p and LMOD1 and DTX4.

## Future Work

- Develop an *in vivo* intervention protocol (use let-7a-5p antagonism seems most appropriate).
- Analyse miRNA expression in human urine samples from patients with CKD and correlate the results with ON.

### Reference:

- Papadopoulos T, Belliere J, Bascands JL, Neau E, Klein J, Schanstra JP. miRNAs in urine: a mirror image of kidney disease? *Expert review of molecular diagnostics*, 15(3), 361-374 (2015).
- Klein J, Gonzalez J, Miravete M et al. Congenital ureteropelvic junction obstruction: human disease and animal models. *International journal of experimental pathology*, 92(3), 168-192 (2011).

### Acknowledgements / Financial disclosure

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