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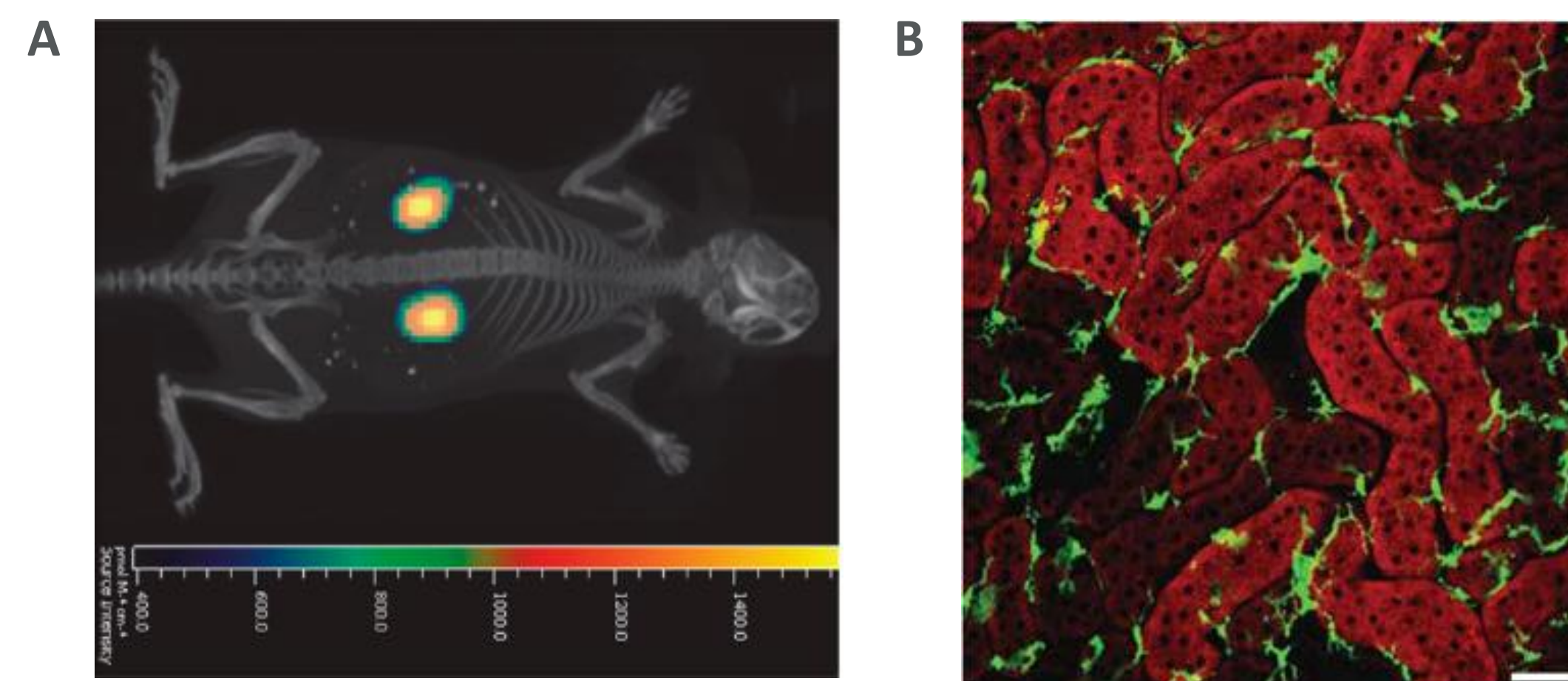
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Background

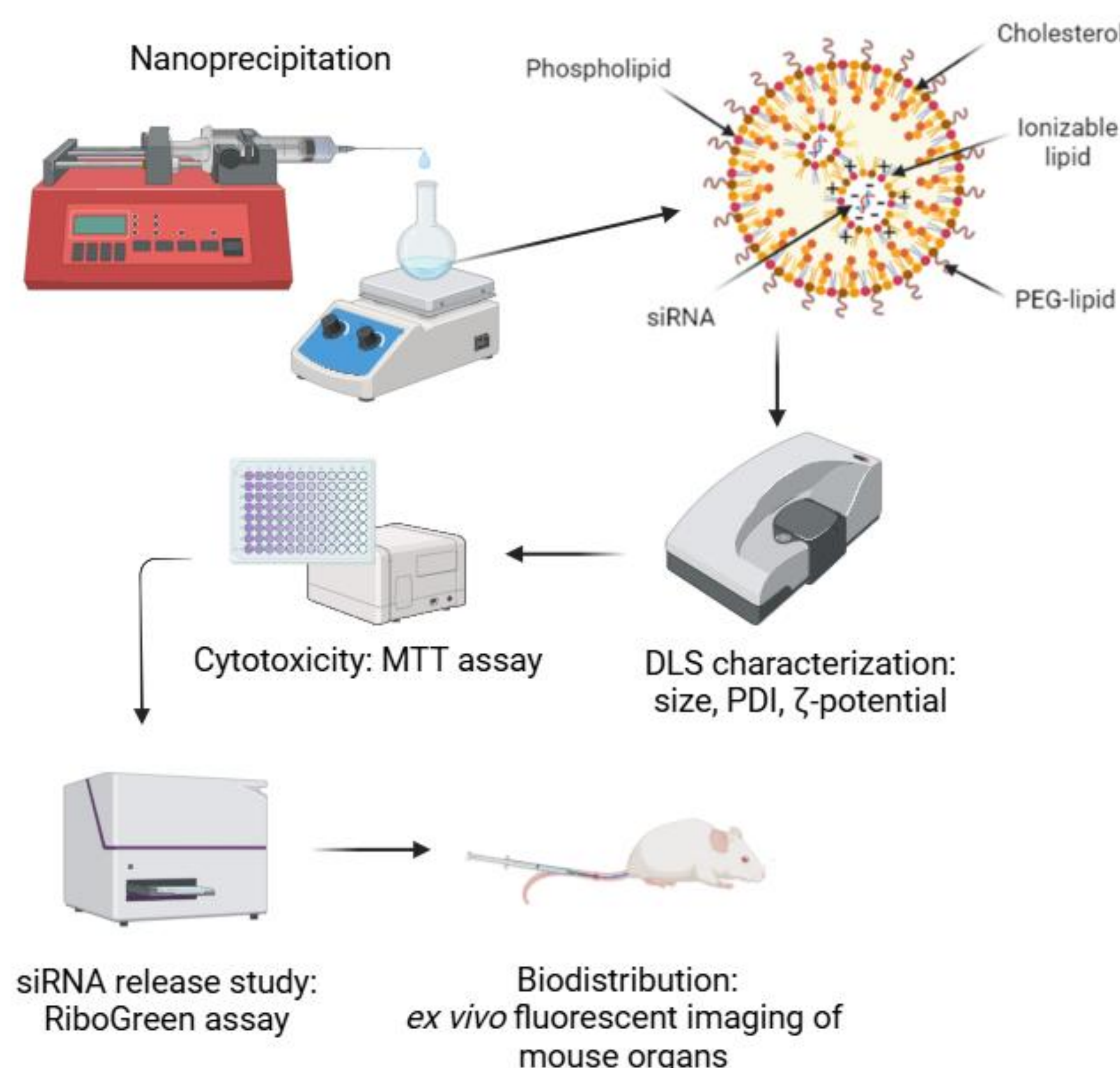
- PEGylated nanoparticles with a size in the mesoscale range (300 – 500 nm) **selectively accumulate in renal proximal tubule** epithelium 26-fold more than any other organ^[1].



(A) MNP localization to the kidneys in mice^[1]. (B) Intravital microscopy of MNPs (red) in kidneys of mice with GFP-producing macrophages (green)^[2].

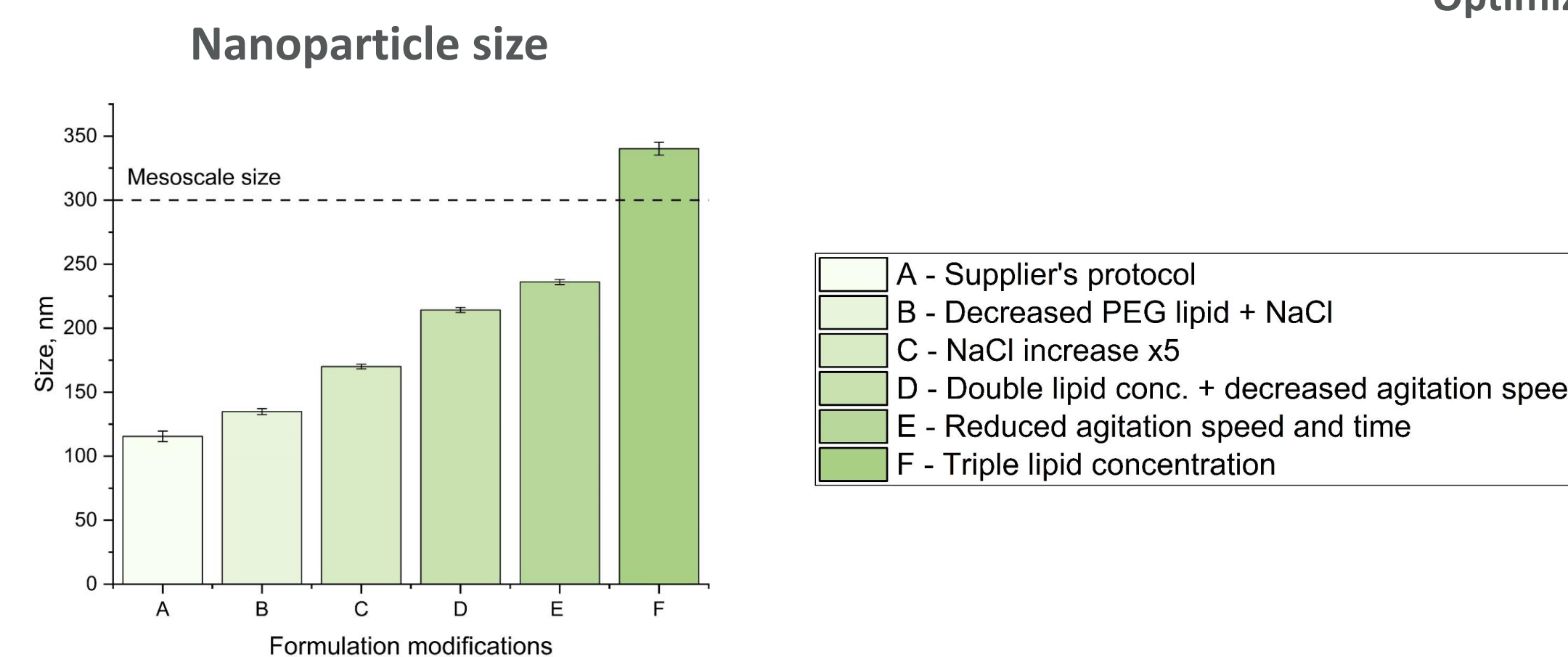
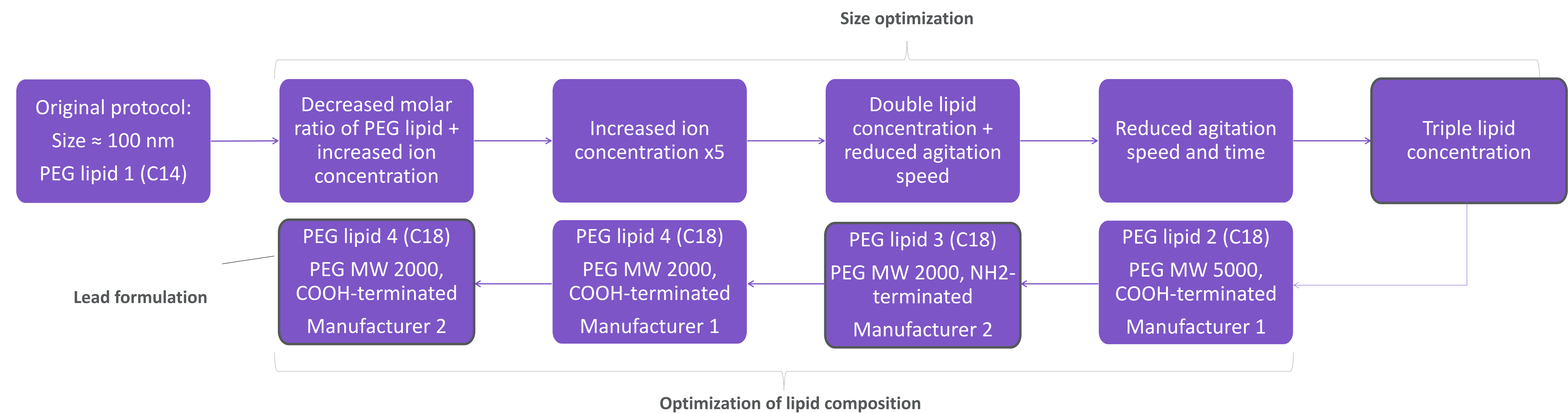
- Mesoscale nanoparticle kidney targeting has so far only been shown with polymeric carriers.
- With the rise of nucleic acid therapies, lipid nanoparticles have proven to be efficient carriers for biological cargo^[3].
- Our goal was to **develop a lipid-based mesoscale nanoparticle formulation for targeted delivery of nucleic acids to the kidneys**.

Methods



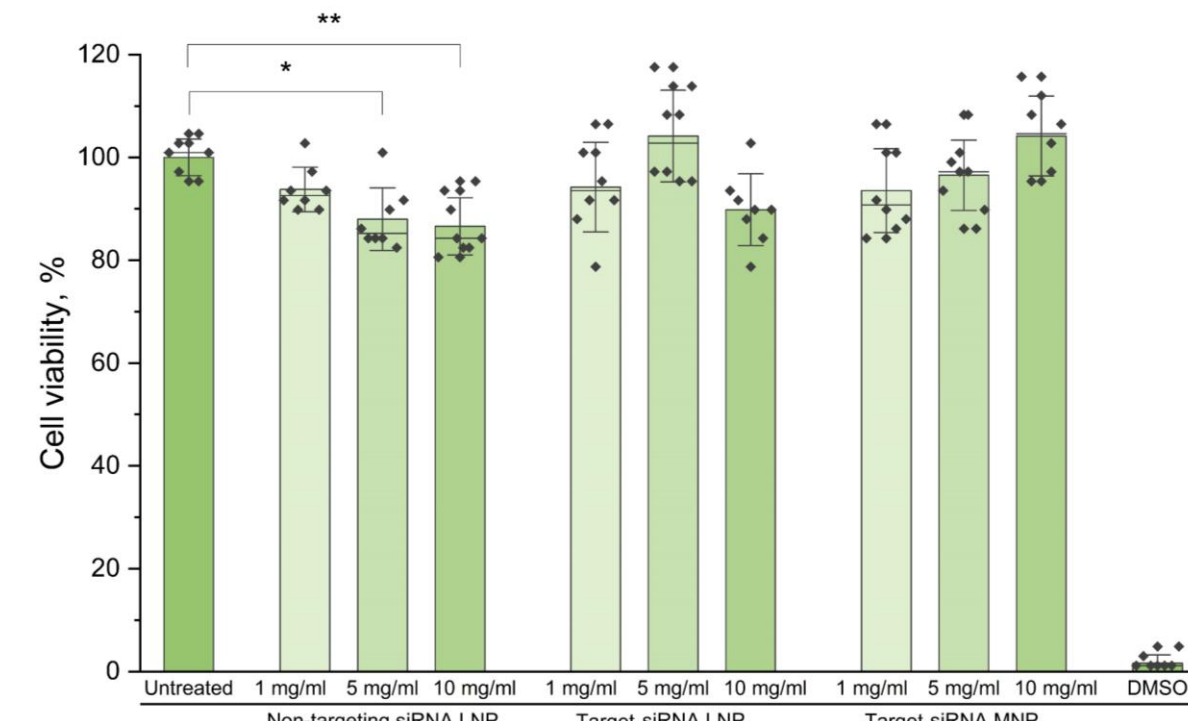
Results

Formulation development and optimization

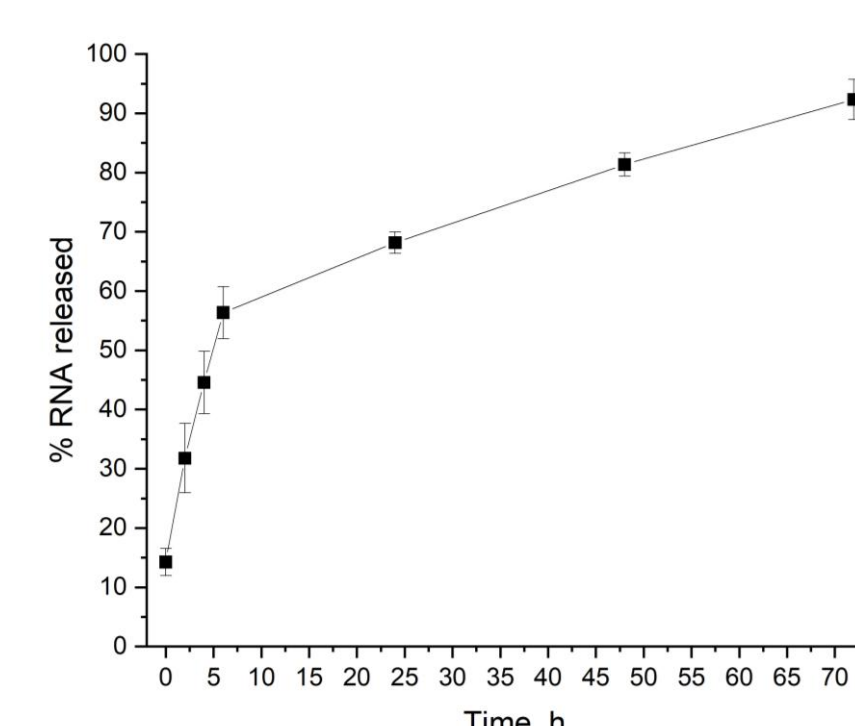


In vitro testing

Viability of HK-2 cells after 48h MLNP treatment

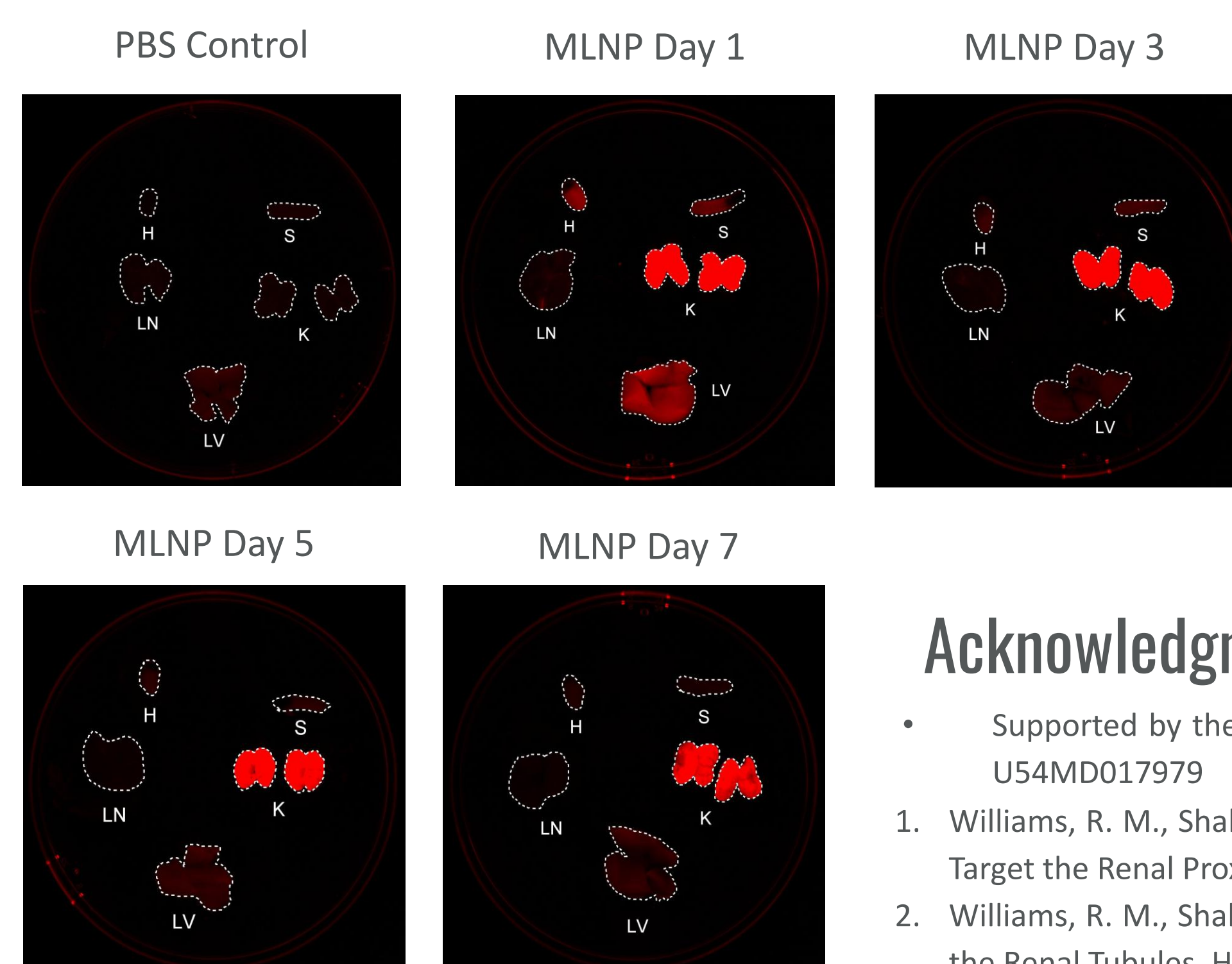


siRNA release from MLNPs in PBS at 37°C

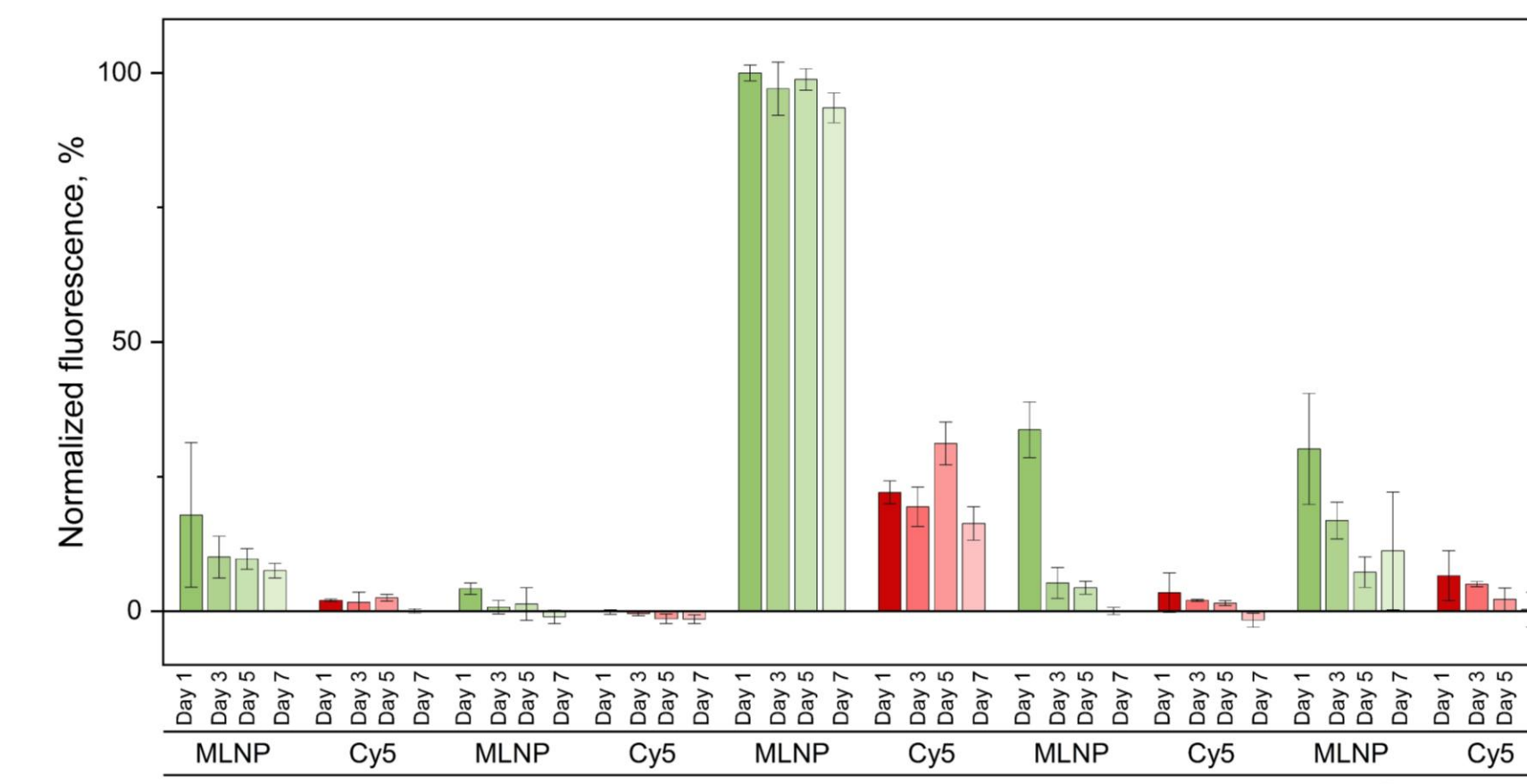


In vivo testing

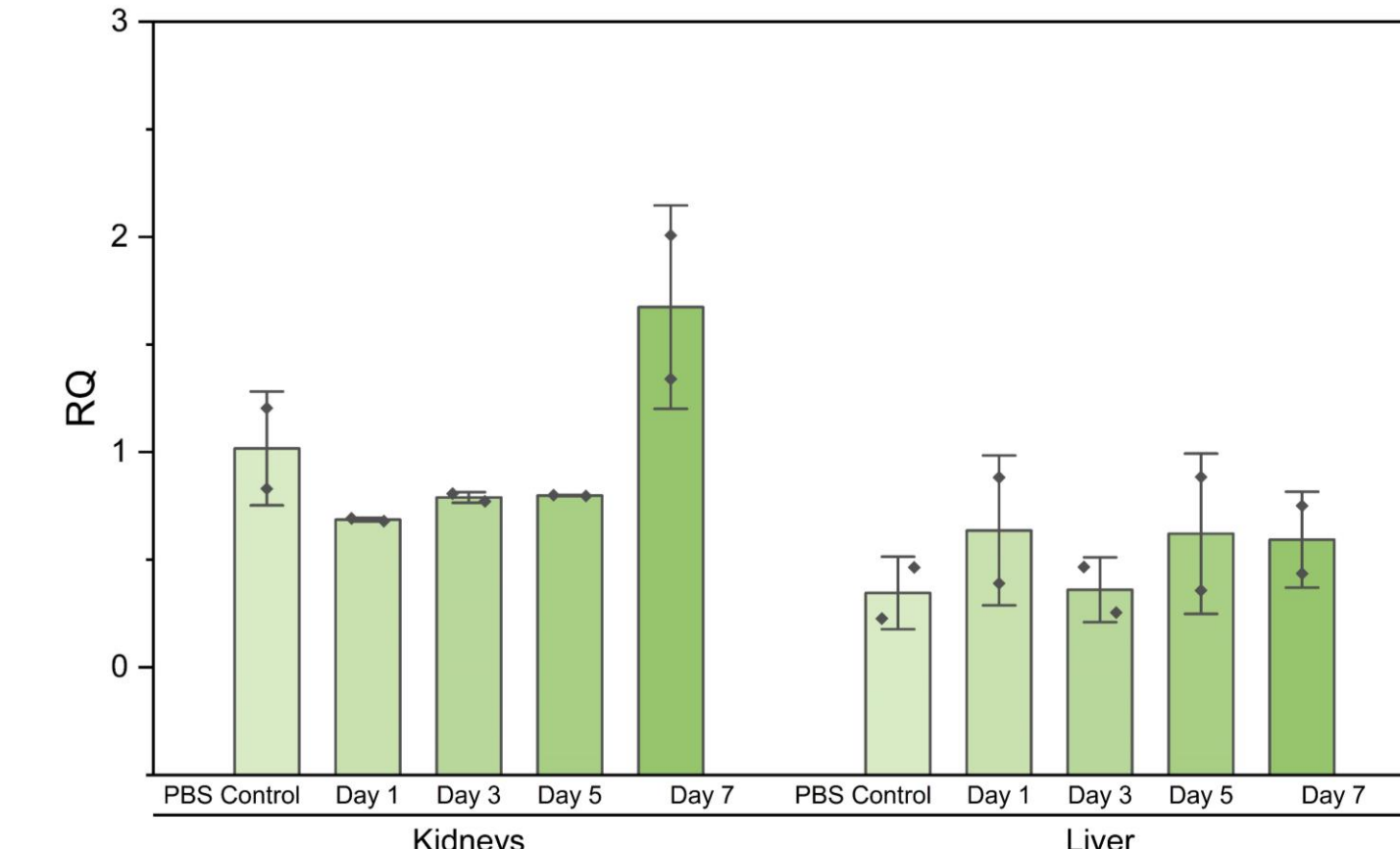
Fluorescence imaging of mouse organs after Cy5 MLNP treatment



Organ Fluorescence Quantification



qPCR Quantification of Target mRNA



Acknowledgments/References

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- Williams, R. M., Shah, J., Tian, H. S., Chen, X., Geissmann, F., Jaimes, E. A., & Heller, D. A. (2018). Selective Nanoparticle Targeting of the Renal Tubules. *Hypertension*, 71(1), 87–94.
- Hou, X., Zaks, T., Langer, R., & Dong, Y. (2021). Lipid nanoparticles for mRNA delivery. *Nature Reviews Materials*, 6(12), 1078–1094.

