

# Time Course Study of Blood-pool and Liver Targeting Gold Nanoparticle Contrast Agents

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## Purpose

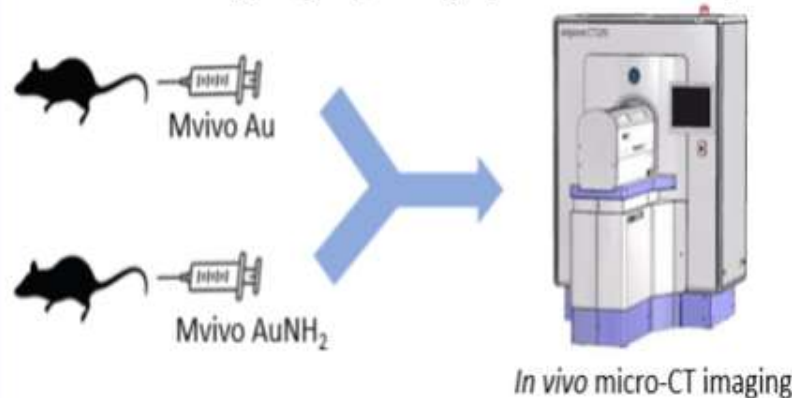
To investigate and compare the contrast enhancement (CE) and behavior of Mvivo Au, a blood pool agent, and Mvivo AuNH<sub>2</sub>, a liver targeting contrast agent.

## Methods

Mvivo Au and Mvivo AuNH<sub>2</sub> were each injected (0.1mL per mouse) into a group of five healthy C57Bl6 mice via tail vein injection. *In vivo* micro-CT scans were obtained for: pre-contrast, post-contrast 0, 0.5, 24 and 72 hours.

The CE was measured for three groups of organs:

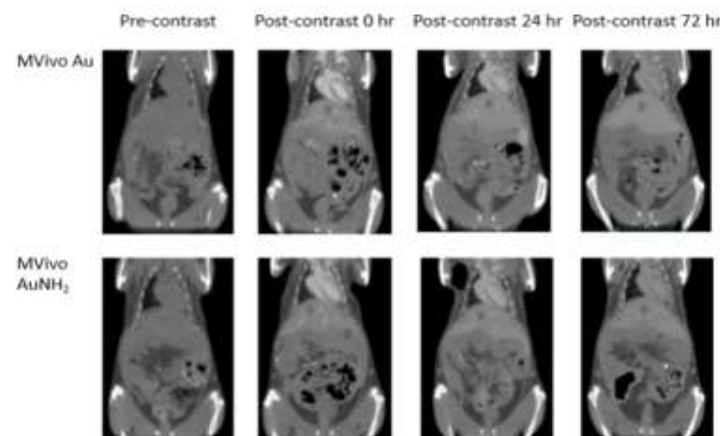
- non-enhancing regions (air and left leg muscle),
- vascular system organs (right ventricle and vena cava) and
- clearance organs (liver, kidney, spleen and bladder).<sup>1</sup>



## Results

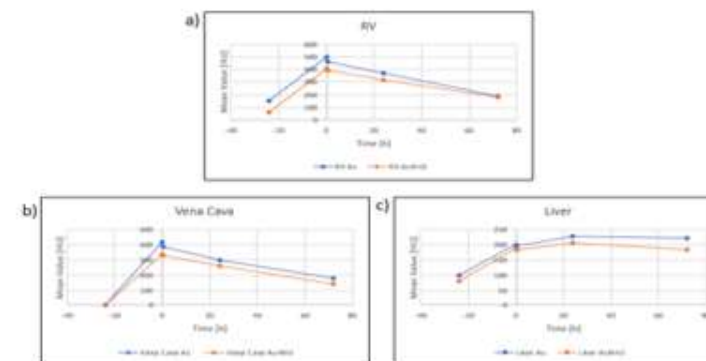
The micro-CT images were compared for Mvivo Au and Mvivo AuNH<sub>2</sub> at the same time points.

- Mvivo AuNH<sub>2</sub> was expected to accumulate in the liver but the results were similar to Mvivo Au.



The raw data confirms the CE for:

- Non-enhancing and enhanced vascular system organs
  - Increased from pre-contrast to post-contrast 0.5 hr
  - Decreased from post-contrast 0.5 hr to 72 hr
- Clearance organs
  - Increased from pre-contrast to post-contrast 72 hr



## Conclusions

- Mvivo AuNH<sub>2</sub> did not perform as expected since no accumulation in the liver was observed.
- Modify the negative zeta potential on the terminal NH<sub>2</sub> group of Mvivo AuNH<sub>2</sub> to promote liver attraction.

## Acknowledgements

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## Reference

<sup>1</sup> El Ketara S, Ford NL. Time-course study of a gold nanoparticle contrast agent for cardiac-gated micro-CT imaging in mice. *Biomedical physics & engineering express*. 2020;6(3):35025. doi: 10.1088/2057-1976/ab8741.