

Ultrasmall Gold Nanoparticles: In vivo Transport, Interactions and Biomedical Applications

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Ultrasmall gold nanoparticles with diverse surface chemistries exhibit unique in vivo transport and interactions in the normal and diseased tissues. In this talk, I will present our decades' efforts on fundamental understandings of their elimination pathways and biochemical interactions with organs, followed by discussing how these new understandings of physiology on the nanoscale lead to innovative tools for early diagnosis of organ injuries, enhancing the precision in cancer surgery and reducing side effects in the chemotherapy.

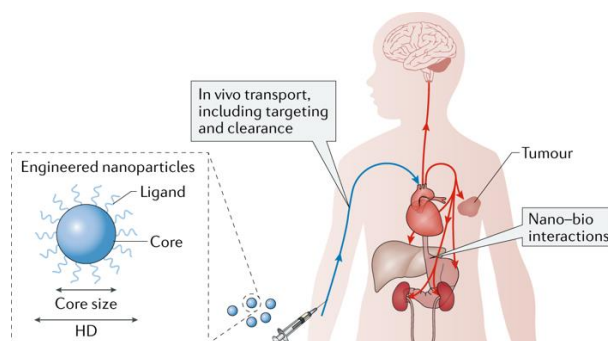


Fig.1 Engineered nanoparticles transport and interactions in the native physiological environment (Nature Reviews Materials, 2018)

References

- (1) B.J. Du, X.Y. Jiang, A. Das, Q.H. Zhou, M.Y. Yu, R.C. Jin, J. Zheng "Glomerular barrier behaves as an atomically precise bandpass filter in a sub-nanometre regime", **Nature Nanotechnology**, 2017, 1096
- (2) B.J. Du, M.X. J. Zheng, "Transport and interactions of nanoparticles in the kidneys" **Nature Reviews Materials**, 2018, 358
- (3) C.Q. Peng, J. Xu, M.X. Yu, X.H. Ning, Y.Y. Huang, B.J. Du, E. Hernandez, P. Kapur, J-T Hsieh and Jie Zheng "Tuning in vivo transport of anticancer drugs with renal-clearable gold nanoparticles" **Angew. Chem. Int. Ed.** 2019. 10.1002/anie.201903256
- (4) X.Y. Jiang, B. J. Du., J. Zheng, "Glutathione-mediated biotransformation in the liver modulates nanoparticle transport", **Nature Nanotechnology**, 2019, <https://doi.org/10.1038/s41565-019-0499-6>
- (5) M.X. Yu, J. Xu, J. Zheng, "Renal Clearable Luminescent Gold Nanoparticles: From Bench to Clinics", **Angew. Chem. Int. Ed.**, 2019, 4112-4128



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Dr. Jie Zheng

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