

主な研究課題・発表代表論文

器官解剖学講座（旧解剖学第一講座）Organ Anatomy and NANOMEDICINE

研究領域 人体機能統御学

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主な研究課題

- ・多機能ナノ粒子を用いた細胞のイメージングと機能解析：マクロファージ特異性の解明等
- ・生体から器官，組織，細胞，細胞内小器官レベルへ至るイメージング技術の開発：近赤外蛍光イメージング、X線CT、蛍光顕微鏡、電子顕微鏡の統合的応用
- ・診断と治療の一体化（Theranostics）による革新的医療の開発：放射線治療、磁場/光線温熱治療、ドラッグデリバリーシステムによる多戦略治療とイメージング技術の融合

発表代表論文

- 1) Mochizuki C, et al. Surface Functionalization of organosilica nanoparticles with Au nanoparticles inhibits cell proliferation and induces cell death in 4T1 mouse mammary tumor cells for DNA and mitochondrial-synergized damage in radiotherapy. *Frontiers in Chemistry*, 2022, 10, 907642.
- 2) Nakamura M, et al. Analysis of cell-nanoparticle interactions and imaging of in vitro labeled cells showing barcoded endosomes using fluorescent thiol-organosilica nanoparticles surface-functionalized with polyethyleneimine. *Nanoscale Advances*, 4, 2682, 2022.
- 3) Nakamura M, et al. Near-infrared fluorescent thiol-organosilica nanoparticles that are functionalized with IR-820 and their applications for long-term imaging of in situ labeled cells and depth-dependent tumor in vivo imaging. *Chemistry of Materials*, 32, 7201-14, 2020.
- 4) Nakamura M. Organosilica nanoparticles and medical imaging. *The Enzymes*, 44, 137-173, 2018.
- 5) Nakamura M, et al. Relaxometric property of organosilica nanoparticles internally functionalized with iron oxide and fluorescent dye for multimodal imaging. *Journal of Colloid and Interface Science*, 492, 127-35, 2017.
- 6) Nakamura M, et al. Identification of polyethylene glycol-resistant macrophages on stealth imaging in vitro using fluorescent organosilica nanoparticles. *ACS nano*, 9, 1058-71, 2015.
- 7) Nakamura M, et al. Time-lapse fluorescence imaging and quantitative single cell and endosomal analysis of peritoneal macrophages using fluorescent organosilica nanoparticles. *Nanomedicine : Nanotechnology, Biology, and Medicine*, 9(2), 274-283, 2013.
- 8) Nakamura M, et al. Thiol-organosilica particles internally functionalized with propidium iodide as a multicolor fluorescence and X-ray computed tomography probe and application for non-invasive functional gastrointestinal tract imaging. *Chemistry of Materials*, 24, 3772-9, 2012.