

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

教授 中村 教泰 Michihiro Nakamura

Web ページ：<http://ds.cc.yamaguchi-u.ac.jp/~nanomed1/>

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：近赤外蛍光生体イメージング、X線CT、(高解像度)蛍光顕微鏡、電子顕微鏡の統合的観察等
- ・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等

発表代表論文（筆頭または責任著者）

- 1) Nakamura M, et al. Size effect of fluorescent thiol-organosilica particles on their distribution in the mouse spleen. *Colloids and Surfaces B: Biointerfaces*, 2023, 228, 113397 (1-15).
- 2) Kuroda C, et al. Size-dependent distribution of fluorescent thiol-organosilica particles in popliteal lymph nodes of mice. *OpenNano*, 2023, 9, 100114 (1-11).
- 3) 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 (1-15).
- 4) 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*, 2022, 4, 2682-2703.
- 5) Mochizuki C, et al. Photostable and Biocompatible Luminescent Thiol-Terminated Organosilica Nanoparticles with Embedded Au(I)-Thiolate Complexes for Fluorescent Microscopic Imaging. *ACS Applied Nano Materials*, 2021, 4(12) 13305-13318.
- 6) Kim H, et al. Protein Corona Components of Polyethylene Glycol-conjugated Organosilica Nanoparticles Modulates Macrophage Uptake. *Colloids and Surfaces B: Biointerfaces*, 2021, 199, 111527 (1-11).
- 7) 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*, 2020, 32, 7201-7214.
- 8) Doura T, et al. Miniaturization of thiol-organosilica nanoparticles induced by an anionic surfactant. *Journal of Colloid and Interface Science*. 2018, 526, 51-62.

- 9) Nakamura M. Organosilica nanoparticles and medical imaging. *The Enzymes*, 44, 137-173, 2018.
- 10) 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*, 2017, 492, 127-135.
- 11) Nakamura M, et al. Mesoscopic Multimodal Imaging Provides New Insight to Tumor Tissue Evaluation: An Example of Macrophage Imaging of Hepatic Tumor using Organosilica Nanoparticles. *Scientific Reports*, 2017, 7(1), 3953 (1-10).
- 12) Nakamura M, et al. Identification of polyethylene glycol-resistant macrophages on stealth imaging in vitro using fluorescent organosilica nanoparticles. *ACS nano*, 2015, 9, 1058-1071.
- 13) 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*, 2013, 9(2), 274-283.
- 14) 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*, 2012, 24, 3772-3779.
- 15) Nakamura M. Biomedical applications of organosilica nanoparticles toward theranostics. *Nanotechnology Reviews*, 2012, 1(6), 469-491.