



# Nishiyama-Miura Lab.

## Development of smart nanomedicine based on fine-tuning synthetic polymers

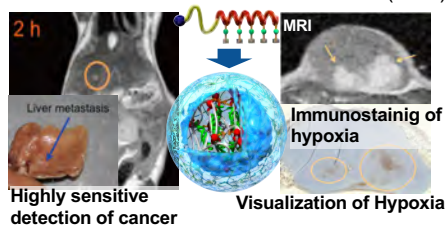
Laboratory for Chemistry and Life Science

<http://www.bmw.res.titech.ac.jp/index-e.html>

In Nishiyama-Miura laboratory, we develop nanomedicines based on the platform of fine-tuning synthetic polymers. By integrating various functionalities such as targetability and environment sensitivity, we aim to realize smart diagnosis and therapy in a spatiotemporally controllable manner.

### Nanomachine Contrast Agents

*Nat. Nanotech.* 11:724-730(2016)

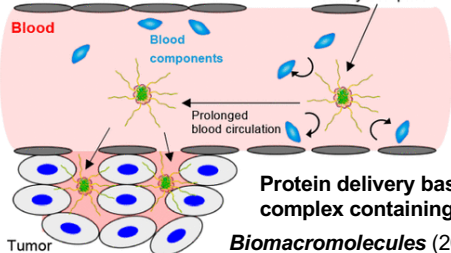
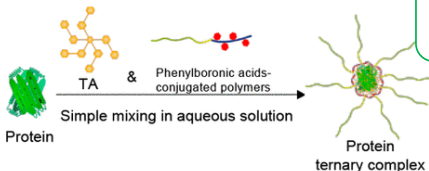


Highly sensitive detection of cancer

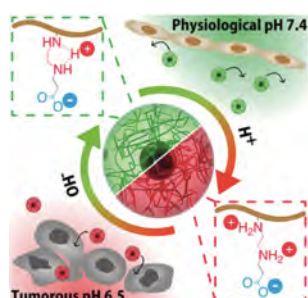
Visualization of Hypoxia

Biofunctional Imaging

Practical use of biomedicine



Protein delivery based on ternary complex containing tannic acid  
*Biomacromolecules* (2020)



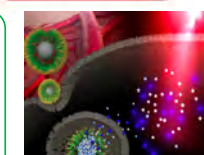
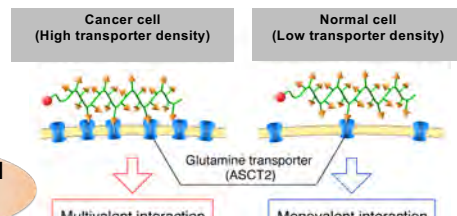
Smart polymer responding to tumor microenvironment

*Angew. Chem. Int. Ed.* 57:5057(2018)

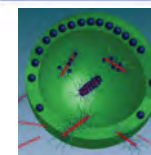
New functional polymer

Smart polymer with a high affinity to cancer cell

*Sci. Rep.* 7:6077(2017)

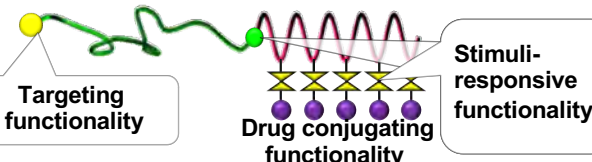


*Biomater. Sci.* 4:826(2016)



*Nat. Commun.* 5:3545(2014)

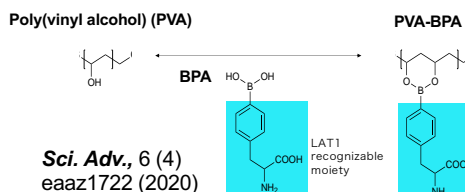
### Polymer-based nanomedicine



Effective non-toxic cancer therapy

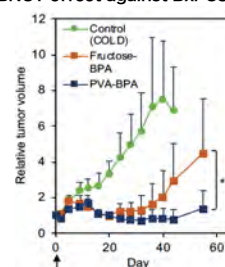
Minimally invasive surgery

BPA delivery for boron neutron capture therapy (BNCT)



*Sci. Adv.*, 6 (4) eaaz1722 (2020)

BNCT effect against BxPC3 model



Nishiyama-Miura Laboratory has established all the facilities and equipments necessary for the polymer synthesis, and creation and evaluation of smart nanomedicines. We welcome highly motivated students with a passion for developing innovative medicines.

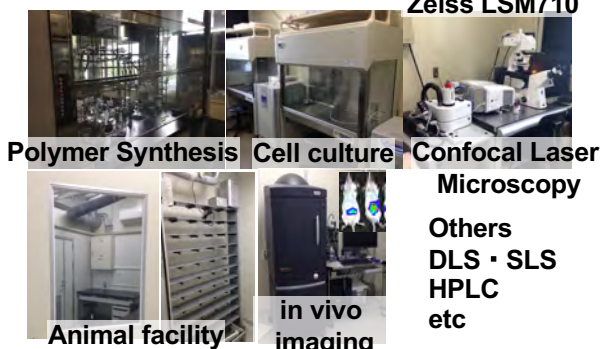
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Nishiyama-Miura Lab homepage

<http://www.bmw.res.titech.ac.jp/index-e.html>

### [Our facilities]



Zeiss LSM710

Polymer Synthesis Cell culture Confocal Laser Microscopy

Microscopy

Others  
DLS · SLS  
HPLC  
etc

Animal facility in vivo imaging