OKAYAMA
UNIVERSITY

Analytical Chemistry Group

“Highly sensitive and portable instrumentation for biochemical analysis”

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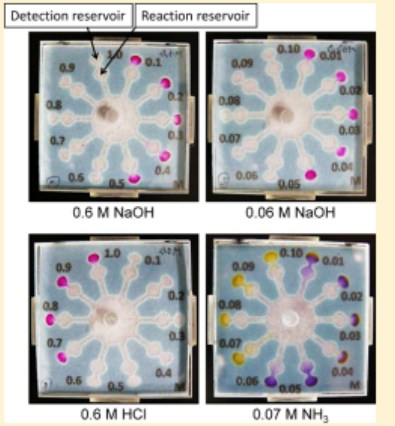
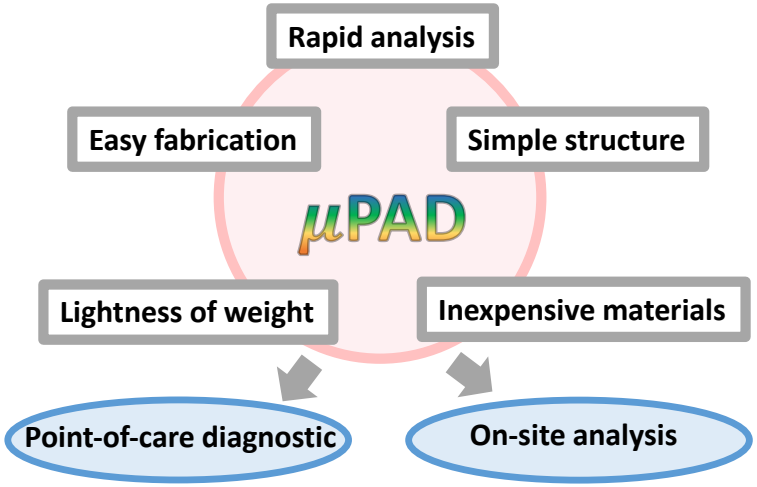
Faculty of Science

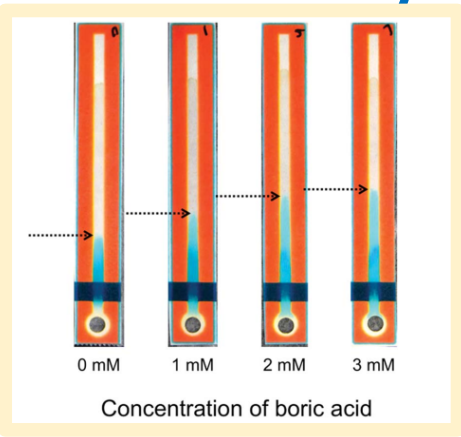
Original website

RESEARCH INTERESTS: 1. Paper-based devices for low-cost and on-site analysis

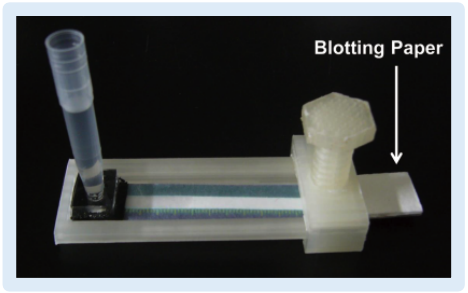


Acid-Base measurement
of hot spring and natural water



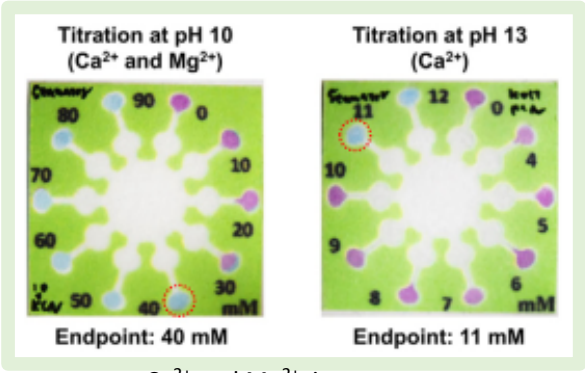


PAD chromatography

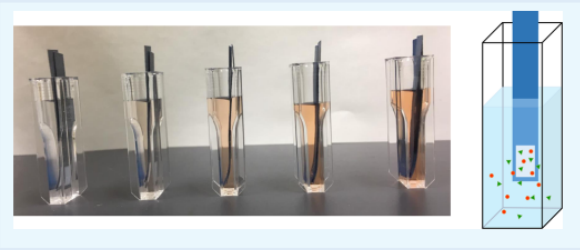


Large sample volume, continuous flow

Example publications



Ca^{2+} and Mg^{2+} in seawaters



Reagent-deposited pieces of paper as
reservoir for portable system

References

S. Karita, T. Kaneta, Anal. Chem., 86, 12108-12114 (2014). (10.1021/ac5039384)
S. Karita, T. Kaneta, Anal. Chim. Acta, 924, 60-67 (2016). (10.1016/j.aca.2016.04.019)
Y. Shimada, T. Kaneta, Anal. Sci., 34, 65–70 (2018). (10.2116/analsci.34.65)
Y. Hashimoto, T. Kaneta, Anal. Methods, 11,179-184 (2019). (10.1039/c8ay02298d)
S. Buking, Y. Suedomi, D. Nacapricha, T. Kaneta, ACS Omega,
4, 15249–15254 (2019). (10.1021/acsomega.9b02226)

RESEARCH : 2. Manipulation of particles, droplets and vesicles by optical force

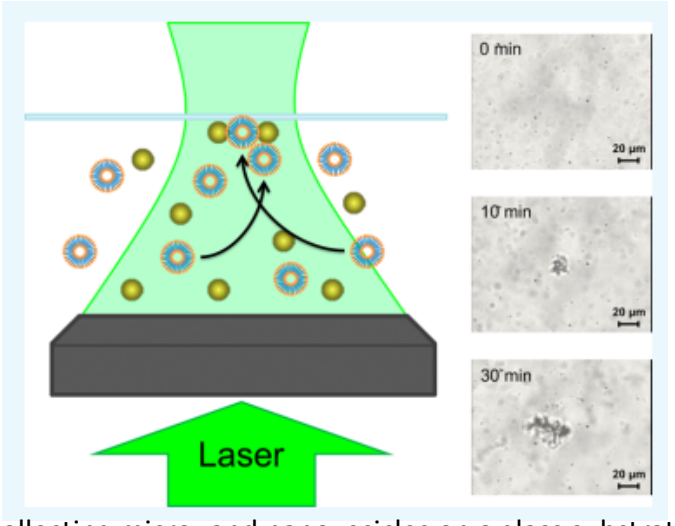
No physical contact with the sample ← **Optical force** → Closed space measurement

Trap and accelerate the micro- and nanometer-sized particle by light

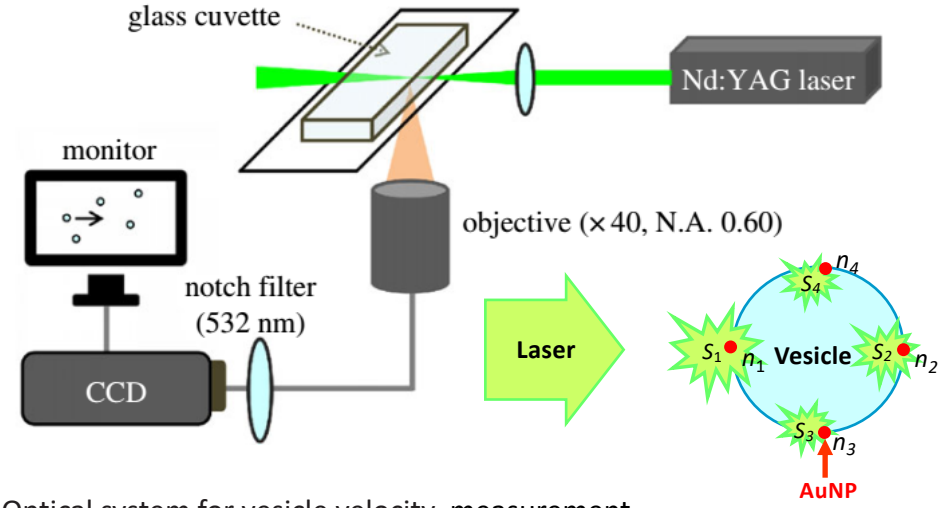
Collect extracellular vesicles (Exosomes)

→ For "Cancer diagnosis"

Example publications



Collecting micro- and nanovesicles on a glass substrate using laser beam optical pressure



Optical system for vesicle velocity measurement

References

M. Kuboi, N. Takeyasu, T. Kaneta, ACS Omega, 3, 2527–2531 (2018). (10.1021/acsomega.8b00033)

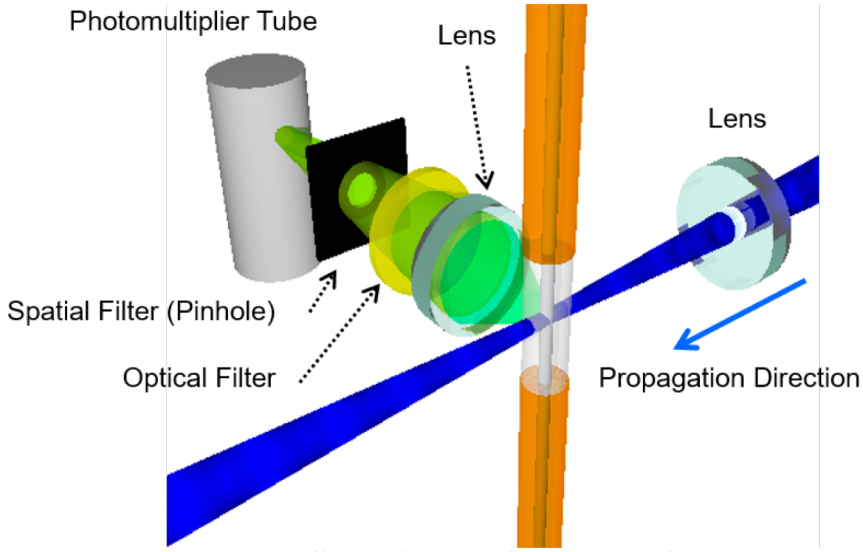
Y. Tani, T. Kaneta, R. Soc. Open Sci., 6, 190293 (2019). (10.1098/rsos.190293)

RESEARCH: 3. Capillary Electrophoresis for bio analysis

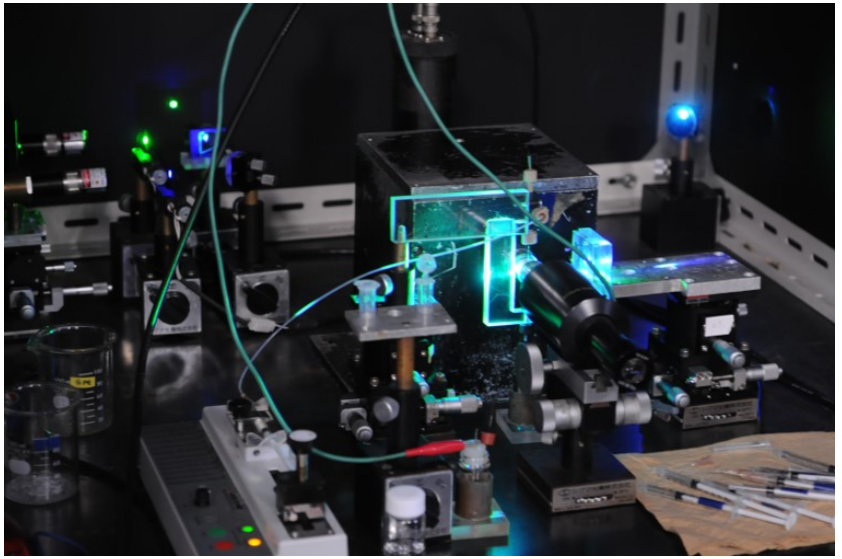
Separation technique | High speed | High resolution | Low sample consumption

Target molecule: Enzyme, Membrane protein, Glycoprotein

Example publications



Capillary Electrophoresis with
laser-induced fluorescence detection

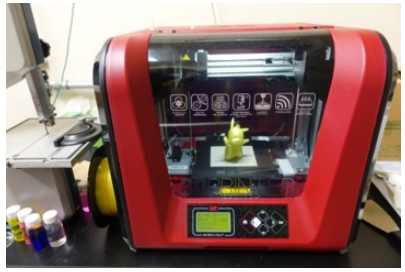


Two-color laser-induced fluorescence detection system

References

A. Tabara, T. Kaneta, Electrophoresis, 34, 2316-2322 (2013). (10.1002/elps.201300149)
T. Fujii, T. Kaneta, Anal. Chim. Acta, 1119, 35–40 (2020). (10.1016/j.aca.2020.04.052)

Equipment



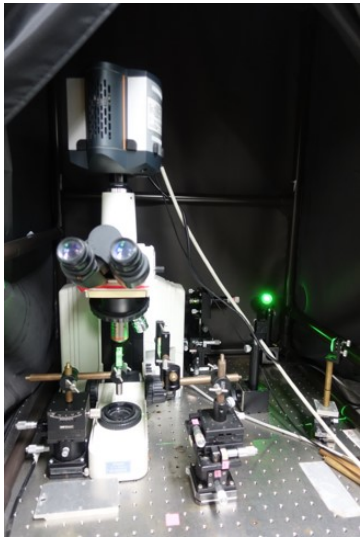
3D-Printer
Making holders for paper-devices

UV-VIS spectrophotometer
Absorbance of colored products

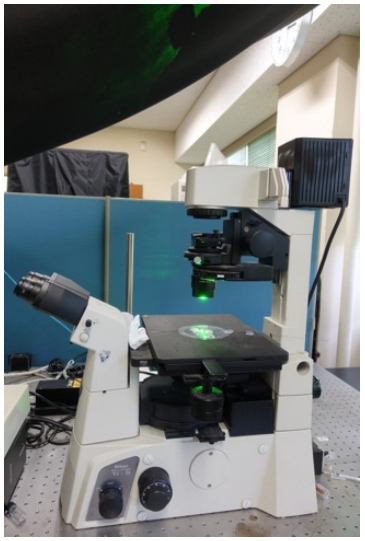
Microplate reader
Absorbance and fluorescence
in microliter plate

Clean bench
Biological cells

Incubator
Cell culture



High sensitive CCD camera
Counting nano-vesicles



Optical trapping system
Collecting nano-vesicles

Collaborations

Thailand

MAHIDOL UNIVERSITY
Wisdom of the Land

Chula
Chulalongkorn University

South Korea

창원대학교
CHANGWON NATIONAL UNIVERSITY

Indonesia

UNIVERSITAS BRAWIJAYA

Ethiopia

ADDIS ABABA UNIVERSITY

France

INP
TOULOUSE

National Polytechnic Institute of Toulouse

USA

Colorado State University

Members -2021

Visiting students

Thailand (2011)

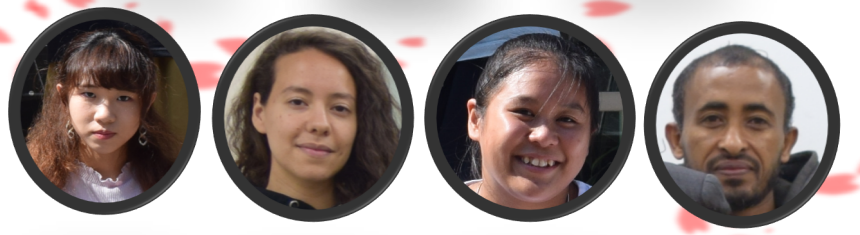
Thailand (2015)

France (2016)

Thailand, France (2017)

France, Thailand and Ethiopia(2018)

France, Thailand and Ethiopia (2019)



Activities in group