YIGANG SHEN

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EDUCATION AND EXPERIENCE

PhD Graduate School of Frontier Biosciences**,** Osaka University; Student trainee, RIKEN 12/2018-- In progress

Research fields: Microelectromechanical Systems (MEMS), microfluidics, cell sorting, single cell analyzes, droplet control, particle manipulation

- Research focus on designing flexible platform for manipulating single cell

Designed and made a thermal manipulation platform (Lab on chip., 2020, 20, 14702)

- Research in cell patterning on the micro-cast structure fabricated by cross-linked albumin

Analysis the flow rate feature and carry on the cell culture (PLOS One, 2019, 15, 023518)

- Research in real-time detection and analysis system for metal particles in lubricating oil using glass microfluidic devices (Sasakawa Scientific Research Grant $7500)
- Research on biosensing and power generation robots using the anhydrobiotic chironomid for space exploring

Design and build the capacitance sensor system for detecting the movement of chironomid

M.S. Marine Engineering, Dalian Maritime University, China 09/2014--03/2017

Research field: Oil analyses, metal particles detecting, microfluidics, particle separation

- Research on single cell sorting and genome sequencing of lung cancer based on microfluidic chip technology

Designed and made the structure of the microfluidics chip (Micromachine., 2017, *8*, 172)

- Research on key issues of the marine power plant oil detecting on a microfluidic Lab-on-Chip device

Thesis: Research on continuous magnetophoresis separation and detection technology of ferromagnetic wear debris in lubricating oil

B.S Marine Engineering, Dalian Maritime University, China 09/2010--07/2014

Core Courses: Engineering Fluid Mechanics, Engineering Mechanics, Fundamentals of Thermal Engineering, Fundamentals of Machine Design, Marine Engineering Materials, Electrical Engineering, Advanced Mathematics. GPA:3.5/5.0

PUBLICATION LIST

- *Area cooling enables thermal positioning and manipulation of single cells*
  Y. Shen,Y, Yalikun, Y. Aishan, N. Tanaka, A. Sato, Y. Tanaka
  Lab Chip, 2020, 20 (Back cover), DOI: 10.1039/d0lc00169d
- *Chapter: Single-cell cultivation utilizing microfluidic systems*
  D. Anggraini, N. Ota, **Y. Shen**, Y. Tanaka, Y. Hosokawa, M. Li, Y, Yalikun.
  Book: Handbook of Single Cell Technologies. Springer, 2020. DOI: 10.1007/978-981-10-4857-9
- *Flow analysis on microcasting with degassed polydimethylsiloxane micro-channels for cell patterning with cross-linked albumin*
  Y. Shen, N. Tanaka, H. Yamazoe, S. Furutani, H. Nagai, T. Kawai, Y. Tanaka
  PLOS One. 2020. 15 e0232518. DOI:10.1371/journal.pone.0232518.
- *Accurate rotation of ultra-Thin glass chamber for single-cell multidirectional observation*
  Y. Aishan, Y. Yalikun, S.I. Funano, **Y. Shen**, Y. Tanaka
  Appl. Phys. Express. 2020. 13 26502. DOI:10.7567/1882-0786/ab626d.
- *Thin glass micro-dome structure based microlens fabricated by accurate thermal expansion of microcavities*

Y. Aishan, Y. Yalikun, S. Amaya, **Y. Shen**, Y. Tanaka
Appl. Phys. Lett.2019. 115. DOI:10.1063/1.5123186.

- *A Microfluidic Platform Based on Robust Gas and Liquid Exchange for Long-term Culturing of Explanted Tissues*
  N. Ota, G. Kanda, H. Moriguchi, Y. Aishan, **Y. Shen**, R. Yamada, H. ueda, Y. Tanaka
  Anal. Sci., 2019. 35.10, 1141-1147. DOI:10.2116/analsci.19P099.
- *Simple Isolation of Single Cell: Thin Glass Microfluidic Device for Observation of Isolated Single Euglena gracilis Cells*
  N. Ota, Y. Yalikun, N. Tanaka, **Y. Shen**, Y. Aishan, Y. Nagahama, M. Oikawa, Y. Tanaka.
  Anal. Sci., 2019. 18, 568-590. DOI: 10.2116/analsci.18P568.
- *Insect Muscular Tissue-Powered Swimming Robot*
  Y. Yalikun, K.Uesugi, M. Hiroki, **Y. Shen**, Y. Tanaka, Y. Akiyama, K. Morishima.
  Actuators, 2019 8, 30-44 DOI: 10.3390/act8020030
- *Recent advances in microfluidic cell sorting systems*
  Y. Shen, Y. Yalikun, Y. Tanaka
  Sensors Actuators B Chem. 2018. 282, 268–281 DOI:10.1016/j.snb.2018.11.025
- *Automatic and selective single cell manipulation in a pressure-driven microfluidic lab-on-chip device*
  Y. Shen, Z Song, Y. Yan, Y. Song
  Micromachines 2017. 8,6, 172 DOI:10.3390/mi8060172

CONFERENCE PRESENTATION

- Organoid Project Workshop 2020 RIKEN, November, online
  [Oral] Y **Shen** Lab-on-chip for cell patterning and manipulation
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020), December, online
  [Poster] T. Tang, **Y. Shen**, Y. Yalikun, Y. Aishan, Y. Tanaka. On-chip integration of ultra-thin glass cantilever for physical property measurement activated by femtosecond laser impulse
- The 24th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS 2020), October, online
  [Poster] **Y. Shen**, Y. Yalikun, Y. Aishan, Y. Tanaka. Thermal manipulation for a single cell utilizing area cooling
- The 23rd International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS 2019), Basel, Switzerland, October.
  [Poster] **Y. Shen**, Y. Yalikun, Y. Tanaka A portable droplet sorting platform with integrated thermocapillary sorting and capacitance detecting
  [Poster] Y. Aishan, Y. Yalikun, S. Amaya, **Y. Shen**, and Y. Tanaka Ultre-thin glass micro dome structure (gmds) for multidirectional cell observation"
  [Poster] Y. Tanaka, S Amaya, D Ma, **Y Shen**, O. Gusev, T. Kikawada and Y. Yalikun Biosensing and power generation robots using the anhydrobiotic chironomid for space exploring
- The first International Conference of Microfluidics, Nanofluidics and Lab-on-a-Chip (ICMFLOC 2016). Dalian, China, July
  [Oral] **Y. Shen**, Q. Ji, X. Pan. On-line wear debris detection in lubricating oil with counting and separation technologies
- China Navigation 2016 Conference, Beijing, China
  [Poster] **Y. Shen,** Y. Song Study on mechanism of inorganic flocculant in ship oil sewage

PATENTS

- **Shen Yigang**, Song yongxing, Pan Xinxiang "Single cell automatic control sorting device based on microfluidic chip", Public No. CN206721175U, 2017

- **Shen Yigang**, Pan Xinxiang, Ji Qiang, 'Particle on-line detection device based on microfluidic chip', Public No.CN205562348U, 2016.
- Ji Qiang, **Shen Yigang**, Pan Xinxiang, 'Droplet generation device based on microfluidic chip and piezoelectric ceramic element', Public No.CN205580993U, 2016.

Record of Research Funding

- 2019 Future Young Researchers Support Project Osaka University | Awarded $2400 scholarship for travelling from Osaka to attend the μTAS 2019 conference in Basel, Switzerland.
- 2018-2019 Sasakawa Scientific Research Grant (No: 2019-2031) | Awarded $7500 research grant to carry on the research in real-time detection and analysis system for metal particles in lubricating oil using glass microfluidic devices

AWARDS

Hot Article Award Analytical Science	2019
Japanese Government Scholarship (MEXT)	2018—present
Challenge Cup National College Student Business Plan Competition (National Bronzed Prize)	2016
Class NK (Japanese) Education Trust Scholarship	2016&2015
"Youth" National University Entrepreneurship Competition National, Bronze Award	2016
Northeast Mathematical Modeling League postgraduate group provincial, first prize	2016
American College Students Mathematical Modeling Contest, Second Prize	2013
Dalian Marine University Second Scholarship	2012
Dalian Marine University College Special Scholarship	2011

EXPERTISE AND SKILLS

- Microelectromechanical Systems fabrication
  Metal sputtering, Lift-off, Mask fabrication, wet etching for glass, PDMS & glass microfluidics chip
- Biology experiment:
  Mammalian cell culture, Fluorescence microscopy, Statistical analysis of microarray data
- Computer skill:
  CAD drawing for microchannel design, COMSOL simulation, basic program coding Python, basic microcontroller skill: Arduino
- Language:
  Chinese (native), English (communication and writing), Japanese (speaking)