

# Kenta Iitani

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## Curriculum Vitae

July 12, 2020

### Contact information:

Affiliation: University of Maryland, Baltimore County,  
Center for Advanced Sensor Technology  
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### Education:

*Doctor of Philosophy in Engineering* April/2016-March/2019  
**Tokyo Medical and Dental University** Tokyo, Japan  
Life Science and Technology, Graduate School of Medical and Dental Sciences  
Thesis: Biofluorometric sniff-cam system for spatiotemporal imaging of human volatile chemicals  
Supervisor: Prof. Kohji Mitsubayashi  
Area of study: transcutaneous gas, biosensor, enzyme, fluorescence, image processing

*Master of Engineering* April/2014-March/2016  
**Tokyo Medical and Dental University** Tokyo, Japan  
Medical and Dental Science and Technology, Graduate School of Medical and Dental Sciences  
Thesis: Gaseous acetaldehyde imaging system using reverse reaction of alcohol dehydrogenase  
Supervisor: Prof. Kohji Mitsubayashi  
Area of study: volatile organic compounds, biosensor, enzyme, fluorescence, image processing

*Bachelor of Engineering, Computer Science* April/2007-March/2014  
**National Institute of Technology, Numazu College** Shizuoka, Japan  
Advanced engineering course, System engineering  
Thesis: Low-cost motion capture system for ultrasound echo supporting robots  
Supervisor: Associate Prof. Yusuke Aoki  
Area of study: robotics, image processing

**Fellowship:**

*Research fellowship for young scientists PD* April/2019 – March/2022

**Japan Society for the Promotion of Science** \$158,125 (include salary)

Topic: Development of biosensor based on electrospinning nanofiber to visualize 3D dynamics of multiple volatile organic compounds transmitted from human body

Supervisor: Prof. Naoya Takeda, Waseda University

*Research fellowship for young scientists DC1* April/2016 – March/2019

**Japan Society for the Promotion of Science** \$83,290 (include salary)

Topic: 3D mapping of aging odor by imaging *trans*-2-nonenal emitted from human body

Supervisor: Prof. Kohji Mitsubayashi, Tokyo Medical and Dental University

**Skill:**

Experimental: Volatile organic compounds analysis  
 Electrospinning  
 Construction of (fiber) optical system  
 UV-Vis/Fluorescence spectroscopy  
 Enzyme immobilization and basic chemical surface modification techniques  
 Machining process (lathe, mill) and basic knowledge in control engineering

Software: Software development (C/C++:Visual Studio and Xcode, Python: Spyder)  
 Image analysis (ImageJ/FIJI, OpenCV)  
 3DCAD (Fusion360)  
 Fluid simulation (Autodesk CFD)

**Peer-reviewed journal paper:**

- 2020 13. T. Arakawa, T. Aota, **K. Jitani**, K. Toma, Y. Iwasaki, and K. Mitsubayashi, "Skin ethanol gas measurement system with a biochemical gas sensor concentrator toward monitoring of blood volatile compounds", *Talanta* (IF5.339), **219**, 121187, [10.1016/j.talanta.2020.121187](https://doi.org/10.1016/j.talanta.2020.121187), (2020).
12. **K. Jitani**, M. Naisierding, K. Toma, T. Arakawa, and K. Mitsubayashi, "Evaluation for regional difference of skin-gas ethanol and sweat rate using alcohol dehydrogenase-mediated fluorometric gas-imaging system (sniff-cam)", *Analyst* (IF3.978), **145**, 2915–2924, [10.1039/C9AN02089F](https://doi.org/10.1039/C9AN02089F), (2020).
11. **K. Jitani**, K. Toma, T. Arakawa, and K. Mitsubayashi, "Transcutaneous Blood VOC Imaging System (Skin-Gas Cam) with Real-Time Bio-Fluorometric Device on Rounded Skin Surface", *ACS Sensors* (IF7.333), **5**, 338–345, [10.1021/acssensors.9b01658](https://doi.org/10.1021/acssensors.9b01658), (2020).

- 2019 10. **K. Iitani**, K. Toma, T. Arakawa, and K. Mitsubayashi, "Ultrasensitive Sniff-cam for Biofluorometric-Imaging of Breath Ethanol Caused by Metabolism of Intestinal Flora", *Analytical Chemistry* (IF6.785), **91**, [10.1021/acs.analchem.8b05840](https://doi.org/10.1021/acs.analchem.8b05840), 9945–9465, (2019).
9. **K. Iitani**, Y. Hayakawa, K. Toma, T. Arakawa, and K. Mitsubayashi, "Switchable sniff-cam (gas-imaging system) based on redox reactions of alcohol dehydrogenase for ethanol and acetaldehyde in exhaled breath", *Talanta* (IF5.339), **197**, 249-256, [10.1016/j.talanta.2018.12.070](https://doi.org/10.1016/j.talanta.2018.12.070), (2019).
- 2018 8. T. Arakawa, T. Suzuki, M. Tsujii, **K. Iitani**, P.J. Chien, M. Ye, K. Toma, Y. Iwasaki, and K. Mitsubayashi, "Real-time monitoring of skin ethanol gas by a high-sensitivity gas phase biosensor (bio-sniffer) for the non-invasive evaluation of volatile blood compounds", *Biosensors and Bioelectronics* (IF10.257), In press, [10.1016/j.bios.2018.09.070](https://doi.org/10.1016/j.bios.2018.09.070), (2018).
7. **K. Iitani**, P.J. Chien, T. Suzuki, K. Toma, T. Arakawa, Y. Iwasaki, and K. Mitsubayashi, "Fiber-Optic bio-sniffer (biochemical gas sensor) using reverse reaction of alcohol dehydrogenase for exhaled acetaldehyde", *ACS Sensors* (IF7.333), **3**, 425-431, [10.1021/acssensors.7b00865](https://doi.org/10.1021/acssensors.7b00865), (2018).
6. **K. Iitani**, T. Sato, M. Naisierding, Y. Hayakawa, K. Toma, T. Arakawa, and K. Mitsubayashi, "Fluorometric sniff-cam (gas-imaging system) utilizing alcohol dehydrogenase for imaging concentration distribution of acetaldehyde in breath and transdermal vapor after drinking", *Analytical Chemistry* (IF6.785), **90**, 2678-2685, [10.1021/acs.analchem.7b04474](https://doi.org/10.1021/acs.analchem.7b04474), (2018).
- 2017 5. **K. Iitani**, P.J. Chien, T. Suzuki, K. Toma, T. Arakawa, Y. Iwasaki, and K. Mitsubayashi, "Improved sensitivity of acetaldehyde biosensor by detecting ADH reverse reaction-mediated NADH fluoro-quenching for wine evaluation", *ACS Sensors* (IF7.333), **2**, 940-946, [10.1021/acssensors.7b00184](https://doi.org/10.1021/acssensors.7b00184), (2017).
4. **K. Iitani**, T. Sato, M. Naisierding, Y. Hayakawa, K. Toma, T. Arakawa, and K. Mitsubayashi, "Fluorometric gas-imaging system (sniff-cam), using extinction of NADH with an ADH reverse reaction, for acetaldehyde in the gas phase", *Analyst* (IF3.978), **142**, 3830-3836, [10.1039/C7AN00524E](https://doi.org/10.1039/C7AN00524E), (2017).
3. T. Arakawa, T. Sato, **K. Iitani**, K. Toma, and K. Mitsubayashi, "Fluorometric Biosniffer Camera "Sniff-Cam" for Direct Imaging of Gaseous Ethanol in Breath and Transdermal Vapor", *Analytical Chemistry* (IF6.785), **89**, 4495-4501, [10.1021/acs.analchem.6b04676](https://doi.org/10.1021/acs.analchem.6b04676), (2017).
- 2015 2. T. Arakawa, **K. Iitani**, X. Wang, T. Kajiro, K. Toma, K. Yano, and K. Mitsubayashi, "A sniffer-camera for imaging of ethanol vaporization from wine: the effect of wine glass shape", *Analyst* (IF3.978), **140**, 2881-2886, [10.1039/C4AN02390K](https://doi.org/10.1039/C4AN02390K), (2015).

- 2014 1. **K. Iitani**, T. Sato, K. Toma, T. Arakawa, and K. Mitsubayashi, ““Sniffer-camera” using enzyme reaction for visualization of transpired ethanol from palm skin”, *Journal of Advanced Science (in Japanese)*, **26**, [10.2978/jsas.26.20](https://doi.org/10.2978/jsas.26.20), 20-22, (2014).

### Conference proceeding:

- 2019 5. **K. Iitani**, T. Sato, K. Toma, T. Arakawa, and K. Mitsubayashi, “Bio-fluorometric realtime gas-imaging system (sniff-cam) for skin ethanol vapor”, 2019 IEEE International Symposium on Olfaction and Electronic Nose, [10.1109/ISOEN.2019.8823482](https://doi.org/10.1109/ISOEN.2019.8823482), (2019).
- 2016 4. **K. Iitani**, M. Naisierding, T. Sato, K. Toma, T. Arakawa and K. Mitsubayashi. “Sniff-Cam (bio-fluorometric gas-imaging system) for Breath Acetaldehyde after Drinking”, *ECS Transactions*, **75**, 53-57, [10.1149/07516.0053ecst](https://doi.org/10.1149/07516.0053ecst), (2016).
3. T. Arakawa, T. Sato, **K. Iitani**, M. Naisierding, K. Toma, and K. Mitsubayashi, “Fluorometric imaging system “sniffer-cam” for human breath and skin gas in evaluation of alcohol metabolism”, *2016 International Conference on Optical MEMS and Nanophotonics*, [10.1109/OMN.2016.7565872](https://doi.org/10.1109/OMN.2016.7565872), (2016).
2. T. Arakawa, K. Toma **K. Iitani**, T. Sato, K. Toma, and K. Mitsubayashi, “Ethanol vapor imaging system “sniffer camera” for evaluation of alcohol metabolism from breath and palm skin gas”, *Procedia Engineering*, **168**, 522-528, [10.1016/j.proeng.2016.11.514](https://doi.org/10.1016/j.proeng.2016.11.514), (2016).
- 2015 1. T. Arakawa, **K. Iitani**, T. Sato, K. Toma, and K. Mitsubayashi, “A two-dimensional fluorometric imaging “sniffer camera” of ethanol vapor for evaluation of alcohol metabolism using enzymatic reaction”, *2016 IEEE SENSORS*, [10.1109/ICSENS.2015.7370492](https://doi.org/10.1109/ICSENS.2015.7370492), (2015).

### Patent:

- 2018 1. K. Mitsubayashi, T. Arakawa, K. Toma, T. Suzuki, **K. Iitani**, “Measurement system of gas derived from human”, PCT/JP2018/043291, submitted with International Patent Cooperation Treaty, November 2018.

### Presentation (displaying only international conference):

2019

- [Oral] **K. Iitani**, N. Mizukoshi, K. Toma, T. Arakawa, and K. Mitsubayashi, “Skin VOCs imaging system by spatiotemporal bio-fluorometry for transcutaneous ethanol vapor”, *6th International Conference on Bio-sensing Technology*, 16–19, June, Kuala Lumpur, Malaysia, 2019.

- [Oral] **K. Jitani**, T. Sato, K. Toma, T. Arakawa, and K. Mitsubayashi, “Bio-fluorometric realtime gas-imaging system (sniff-cam) for skin ethanol vapor”, *18th International Conference of Olfaction and Electronic Nose (ISOEN)*, Fukuoka, Japan, May, 2019.
- [Oral] **K. Jitani**, M. Nakaya, K. Toma, T. Arakawa, Y. Tsuchido, K. Mitsubayashi, and N. Takeda, “Biosensing microfiber probe for real-time visual mapping 3D distribution of human transcutaneous metabolic gases”, *Waseda University day at Bonn University Individual Research Workshop on Advanced Research for Aging Society*, Bonn, Germany, May, 2019.

## 2018

- [Poster] **K. Jitani**, Y. Hayakawa, K. Toma, T. Arakawa, and K. Mitsubayashi, “Switchable sniff-cam (Gas-imaging system) based on pH-dependent redox reactions of alcohol dehydrogenase (ADH) between gaseous ethanol and acetaldehyde after drinking”, *Biosensors 2018*, Miami, USA, June, 2018.
- [Oral] **K. Jitani**, K. Toma, T. Arakawa, and K. Mitsubayashi, “Gas-imaging System (Sniff-cam) using NADH-dependent Alcohol Dehydrogenase for Assessment of Alcohol Metabolism”, *22nd Topical Meeting of The international Society of Electrochemistry*, Tokyo, Japan, April 2018.
- [Oral] **K. Jitani**, T. Sato, K. Toma, T. Arakawa, and K. Mitsubayashi, “Biofluorometric gas-imaging system “Sniff-cam” for ethanol and acetaldehyde from body after drinking”, *EUROPT(R)ODE XIV*, Napoli, Italy, March 2018.

## 2017

- [Oral] **K. Jitani**, K. Toma, T. Arakawa, Y. Iwasaki, and K. Mitsubayashi, “Bio-chemical gas sensor (bio-sniffer) for breath acetaldehyde after drink”, *International conference on BioSensors, BioElectronics, BioMedical Devices, BioMEMS/NEMS & Applications 2017 (Bio4Apps 2017)*, Tokyo, Japan, December 2017.
- [Oral] H. Fujimaki, **K. Jitani**, T. Sato, K. Toma, T. Arakawa, K. Mitsubayashi, “Bio-fluorometric imaging system “Sniff-cam” for gaseous ethanol”, *International conference on BioSensors, BioElectronics, BioMedical Devices, BioMEMS/NEMS & Applications 2017 (Bio4Apps 2017)*, Tokyo, Japan, December 2017.
- [Oral] **K. Jitani**, M. Naisierding, Y. Hayakawa, K. Toma, T. Arakawa, and K. Mitsubayashi, “Volatile imaging system “Sniff-cam” using alcohol dehydrogenase for ethanol and acetaldehyde after drinking”, *The 12th Asian Conference on Chemical Sensors (ACCS 2017)*, Hanoi, Vietnam, November 2017.
- [Oral] **K. Jitani**, T. Sato, K. Toma, T. Arakawa, and K. Mitsubayashi, “Gas-imaging system “Sniff-cam” based on pH-dependent redox reactions of alcohol dehydrogenase for ethanol and acetaldehyde after drinking”, *The Irago Conference 2017*, Tokyo, Japan, November 2017.
- [Oral] T. Sato, **K. Jitani**, K. Toma, T. Arakawa, and K. Mitsubayashi, “Sniff-cam (fluorometric gas-imaging system) with enzyme mesh for gaseous ethanol from human body (breath, skin)”, *EuroAnalysis 2017*, Stockholm, Sweden, August 2017.

## 2016

- [Oral] **K. Iitani**, M. Naisierding, T. Sato, K. Toma, T. Arakawa, and K. Mitsubayashi, “Sniff-Cam (Bio-Fluorometric Gas-Imaging System) for Breath Acetaldehyde after Drinking”, *Pacific Rim Meeting on Electrochemical and Solid-state Science (PRiME 2016)*, Honolulu, USA, October 2016.
- [Oral] T. Arakawa, **K. Iitani**, T. Sato, K. Toma, and K. Mitsubayashi, “Ethanol vapor imaging system “sniffer camera” for evaluation of alcohol metabolism from breath and palm skin gas”, *Euroensors 2016*, Budapest, Hungary, September 2016.
- [Oral] T. Arakawa, **K. Iitani**, T. Sato, M. Naisierding, K. Toma, and K. Mitsubayashi, “Fluorometric imaging system “Sniffer-cam” for human breath and skin gas in evaluation of alcohol metabolism”, *2016 International Conference on Optical MEMS and Nanophotonics (OMN 2016)*, Singapore, July 2016.
- [Oral] **K. Iitani**, M. Naisierding, T. Sato, K. Toma, T. Arakawa and K. Mitsubayashi, “Gas-phase Imaging System “sniff-camera” Using Enzyme Mesh for Breath Acetaldehyde after Drinking”, *The 16th International Meeting on Chemical Sensors*, Jeju, Republic of Korea, July 2016.
- [Oral] **K. Iitani**, M. Naisierding, T. Sato, K. Toma, T. Arakawa and K. Mitsubayashi, “Sniff-cam (gaseous chemical imaging system) for breath acetaldehyde as a metabolite of ethanol after drinking”, *The 8th Asia-Pacific Conference of Transducers and Micro/Nano Technologies (APCOT 2016)*, Kanazawa, Japan, June 2016.
- [Poster] T. Arakawa, **K. Iitani**, T. Sato, K. Toma and K. Mitsubayashi, “2D fluorometric sniff-cam with ADH immobilized mesh and UV-LED sheet for gaseous ethanol imaging from a palm skin”, *Biosensors 2016*, Gothenburg, Sweden, May 2016.

## 2015

- [Oral] P.J. Chien, M. Ye, **K. Iitani**, T. Sato, K. Toma, T. Arakawa, K. Mitsubayashi, “Ethanol vapor imaging system “sniffer camera” with UV-LED excitation sheet for monitoring of alcohol metabolism from human”, *Pacificchem 2015*, Hawaii, USA, December 2015.
- [Oral] T. Arakawa, **K. Iitani**, T. Sato, K. Toma, K. Mitsubayashi, “A two-dimensional fluorometric imaging “sniffer camera” of ethanol vapor for evaluation of alcohol metabolism using enzymatic reaction”, *IEEE SENSORS 2015*, Busan, Republic of Korea, November 2015.
- [Poster] T. Sato, **K. Iitani**, K. Toma, T. Arakawa and K. Mitsubayashi, “Sniff-camera for imaging of ethanol vapor in human body gases after drinking”, *ICAVS 2015 : 17th International Conference on Animal and Veterinary Sciences*, Geneva, Switzerland, September, 2015.
- [Oral] T. Arakawa, **K. Iitani**, T. Sato, K. Toma and K. Mitsubayashi, “Sniff-Camera For Imaging of Gaseous Ethanol From Palm Skin After Drinking”, *4th International Symposium on Sensor Science (I3S 2015)*, Basel, Switzerland, July 2015.

[Poster] T. Arakawa, T. Sato, **K. Iitani**, K. Toma and K. Mitsubayashi, “Fluorometric biosniffer camera (gas-imaging system) with UV-LED excitation sheet for transdermal ethanol vapor from palm skin surface”, *4th International Conference on Bio-Sensing Technology*, Lisbon, Portugal, May 2015.

### Award and honor:

- “**Poster Award**” at *2019 SAS intelligent Symposium (Domestic)*, Kanagawa, Japan, 2019.
- “**Research Encouragement Prize Award (2<sup>nd</sup> position), Doctor Student Section**” at *17th IBB BioFuture (Domestic)*, Tokyo, Japan, Jan 2019.
- “**Selected as SPD candidates (excellent researchers chosen from PD candidates, acceptance rate: 7%)**”, from Japan Society for Promotion of Science, October 2018.
- “**Repayment Exemption for Students with Excellent Grades**” from Japan Student Services Organization, Type I (interest-free) scholarship, exemption of all of loan, April, 2016.
- “**Poster Presentation Runner up Award**” at *4th International Conference on Bio-Sensing Technology*, Lisbon, Portugal, May 2015.
- “**Poster Award**” at *26<sup>th</sup> SAS intelligent Symposium (Domestic)*, Kanagawa, Japan, 2014.
- “**Student research achievement award**” from National Institute of Technology Numazu college, March 2014.
- “**Award for excellent student (1<sup>st</sup> position)**” from National Institute of Technology Numazu college, March 2014.
- “**Grand Prize (1<sup>st</sup> position)**” at *Innovative Japan Social Implementation Contest (Domestic)*, Tokyo, Japan, March 2014.
- “**Poster Award in Machine, Electronic Control, and Robotics**” at *Academic & Science Fair (Domestic)*, Shizuoka, Japan, December 2013.
- “**Poster Award in Machine, Electronic Control, and Robotics**” at *Academic & Science Fair (Domestic)*, Shizuoka, Japan, December 2012.
- “**Student research achievement award**” from National Institute of Technology Numazu college, March 2012.

### Reference:

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