

CURRICULUM VITAE

Takeshi Kawano, Ph.D.

Professor

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Biography

2022-present	Visiting Professor Nagoya City University
2022-present	Professor Electronics-Inspired Interdisciplinary Research Institute (EIIRIS) Department of Electrical and Electronic Information Engineering Toyohashi University of Technology
2010-2021	Associate Professor Department of Electrical and Electronic Information Engineering Toyohashi University of Technology
2010-2015	PRESTO Researcher Japan Science and Technology Agency (JST)
2007-2010	Assistant Professor Department of Electrical and Electronic Engineering Toyohashi University of Technology
2005-2007	Postdoctoral Research Fellow (JSPS Postdoctoral Fellowship for Research Abroad) Department of Mechanical Engineering Berkeley Sensor and Actuator Center (BSAC) University of California, Berkeley
2004-2005	Postdoctoral Research Fellow Toyohashi University of Technology
2004	Ph.D., Electronic and Information Engineering Toyohashi University of Technology
2001	M.S., Electrical and Electronic Engineering Toyohashi University of Technology

Awards and Honors

- November 2021 Poster Paper Award at 38th Sensor Symposium (IEEJ) [Tomoaki Banno]
- October 2020 Best Research Award for Young Scientists (IGARASHI Award) at 37th Sensor Symposium (IEEJ) [Shinnosuke Idogawa]
- October 2018 Research Award for Young Scientists at 35th Sensor Symposium (IEEJ) [Shuhei Tsuruhara]
- January 2018 Student Paper Award Finalist at 31th IEEE International Conference on Micro Electro Mechanical Systems (IEEE MEMS 2018) [Yusuke Morikawa]
- October 2017 Research Award for Young Scientists at 34th Sensor Symposium (IEEJ) [Yusuke Seki]
- October 2017 Technical Paper Award, at 34th Sensor Symposium (IEEJ) [Hirohito Sawahata]
- January 2017 Student Paper Award Finalist at 30th IEEE International Conference on Micro Electro Mechanical Systems (IEEE MEMS 2017) [Yusuke Seki]
- October 2016 Research Award for Young Scientists at 33th Sensor Symposium (IEEJ) [Yusuke Morikawa]
- March 2016 2010 Best Lecture Award, Toyohashi University of Technology [Takeshi Kawano]
- March 2012 Research Award at 4th Integrated MEMS symposium, The Study Group of the Integrated MEMS (JSAP) [Shogo Morita]
- January 2012 2010 Best Lecture Award, Toyohashi University of Technology Department of Electrical and Electronic Information Engineering [Takeshi Kawano]
- March 2010 Research Award at 2nd Integrated MEMS symposium, The Study Group of the Integrated MEMS (JSAP) [Akihiro Goryu]
- March 2010 Research Award at 2nd Integrated MEMS symposium, The Study Group of the Integrated MEMS (JSAP) [Akihito Ikedo]
- October 2010 JST PRESTO Research Grant (Decoding and Controlling Brain Information) for Kawano
- June 2009 Outstanding Paper Award at 15th IEEE International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers'09) [Akihito Ikedo]
- February 2009 2008 Highlights Collection (JMM) [Kuniharu Takei]
- July 2008 MEXT JAPAN Research Grant (Brain Machine Interface) for Kawano
- February 2008 IOP Select [Kuniharu Takei]
- Spring 2007 Best Poster Award at Berkeley Sensor and Actuator Center (BSAC) IAB meeting [Takeshi Kawano]
- Spring 2006 Best Paper Award at Berkeley Sensor and Actuator Center (BSAC) IAB meeting [Takeshi Kawano]
- January 2005 IEEE Electron Device Japan Chapter Student Award [Takeshi Kawano]
- October 2004 Japan Society for the Promotion for Science (JSPS) Postdoctoral Fellowship for Research Abroad for 2years at the University of California, Berkeley, USA [Takeshi Kawano]
- March 2001 Young Scientist Presentation Award at 10th Autumn Meeting 2001, Japan Society of Applied Physics (JSAP) [Takeshi Kawano]

Selected Invited Talks

1. **Takeshi Kawano**, “3D micro/nanoneedle and 2D flexible film devices for the brain”, IBRO Workshop 2020, Szeged, Hungary, January 2020.
2. **Takeshi Kawano**, “Micro/nanoscale neural interface devices”, 38th meeting of Litho consortium, Kyoto, Japan, December 2020.
3. **Takeshi Kawano**, “3D micro/nanoneedle and 2D flexible film for neural interfaces”, The 6th CiNet Conference: Brain-Machine Interface – Medical Engineering based on Neuroscience, Osaka, Japan, February 2020.
4. **Takeshi Kawano**, “Flexible, stretchable, and deformable devices for neural interfaces”, The 35th International Conference of Photopolymer Science and Technology, Chiba, Japan, June 2018.
5. **Takeshi Kawano**, “Micro/nano-scale needle devices for the brain”, 28th 2017 International Symposium on Micro-NanoMechatronics and Human Science, Nagoya, Japan, December 2017.
6. **Takeshi Kawano**, “3D integrated micro/nanowire-based neural probe devices”, The 4th International Conference on Advanced Electromaterials (ICAE 2017), Jeju, Korea, November 2017.
7. **Takeshi Kawano**, “3D microtube and 2D flexible film waveguide devices for optical neural interfaces”, The 24th Congress of the International Commission for Optics (ICO-24), Tokyo, Japan, August 2017.
8. **Takeshi Kawano**, “Micro/nanoscale needle technology for brain”, 16th International Conference on Nanotechnology (OMN), Sendai, Japan, August 2016.
9. **Takeshi Kawano**, “3D microtube and 2D flexible film waveguide devices”, 2016 International Conference on Optical MEMS and Nanophotonics (OMN), Singapore, August 2016.
10. **Takeshi Kawano**, “3D Integrated micro/nanowires for electrical, chemical, optical neural interfaces”, Interdisciplinary Research and Global Outlook (IRAGO) conference 2015, Aichi, Japan October 2015.
11. **Takeshi Kawano**, “Silicon-micro/nanowire: an approach to neuron-electronics interface devices”, The 31st SENSOR SYMPOSIUM, Shimane, October 2014.
12. **Takeshi Kawano**, “Electrical, chemical, optical micro/nanoscale neuroprobes”, The 7th Asia-Pacific Conference on Transducers and Micro/Nano Technologies (APCOT), Daegu, Korea, June 2014.
13. **Takeshi Kawano**, “Review on Transducers'13”, 9th meeting of Litho consortium, Kyoto, Japan, September 2013.
14. **Takeshi Kawano**, “Nanoscale neuroprobe array devices”, The 60th Japan Society of Applied Physics (JSAP) Spring Meeting, Kanagawa, Japan, March 2013.

15. **Takeshi Kawano**, “At human scale and quality of life”, NBIC2 Korea-U.S.-Japan Workshop, Seoul, Korea, October 2012.
16. **Takeshi Kawano**, “Three dimensional micro/nanowire arrays for sensing applications”, 26th meeting on Japan Institute of Electronics Packaging, Tokyo, Japan, March 2012.
17. **Takeshi Kawano**, “Neural interface microprobe/tube array devices”, Ritsumeikan University, Kyoto, Japan, October 2011.
18. **Takeshi Kawano**, “Vertically integrated silicon wires for neural interface and artificial whisker electronics”, KAIST Department organized seminar, Daejeon, South Korea, February 2011.
19. **Takeshi Kawano**, “Integrated silicon microprobe/tube arrays for neural interface”, 2nd UK-Japan Workshop on the Brain-Machine Interface, Institute of Neuroscience Newcastle University, UK, February 2010.
20. **Takeshi Kawano**, “Integrated neuroprobe/tube arrays: microdevices for neural interface”, International workshop on Advances in Neuroengineering (Osaka University Global COE Program), Osaka University, Japan, February 2010.
21. **Takeshi Kawano**, “Integrated neuroprobe/tube arrays: microdevices for neural interface, International Symposium on Toyohashi Global COE Program, Tokyo, Japan, November 2009.
22. **Takeshi Kawano**, “Silicon micro/nano-probe neural interface devices by vapor-liquid-solid growth”, LifeChips (University of California, Irvine), Irvine, USA, January 2009.
23. **Takeshi Kawano**, “Integrated nanotubes and applications”, Berkeley Sensor and Actuator Center (BSAC) Kyoto technology symposium, Kyoto, Japan, December 2007.
24. **Takeshi Kawano**, “Multichannel microprobe electrode array Chip for analysis of the nervous system”, Berkeley Sensor and Actuator Center (BSAC) lunch seminar at UC Berkeley, January 2006.

Reviewer

Advanced Functional Materials, Advanced Healthcare Materials, Advanced Materials Technologies, Biosensors and Bioelectronics, IEEE Electron Device Letters, Frontiers in Aging, IEEE Journal of Microelectromechanical Systems, IEEE Transactions on Biomedical Engineering, IEEE Sensors, Japanese Journal of Applied of Physics, Sensors and Actuators A, Sensors and Actuators B, Sensors and Materials, Small

Journals

1. Tomoaki Banno, Shuhei Tsuruhara, Yu Seikoba, Ryohei Tonai, Koji Yamashita, Shinnosuke Idogawa, Yuto Kita, Ko Suzuki, Yuki Yagi, Yuki Kondo, Rika Numano, Kowa Koida and **Takeshi Kawano**, “Nanoneedle-electrode Devices for *in vivo* Recording of Extracellular Action Potentials,” *ACS Nano*, *in press*.
2. Rika Numano, Akihiro Goryu, Yoshihiro Kubota, Hirohito Sawahata, Shota Yamagiwa, Minako Matsuo, Tadahiro Iimura, Hajime Tei, Makoto Ishida and **Takeshi Kawano**, “Nanoscale-tipped Wire Array Injections Transfer DNA Directly into Brain Cells *ex vivo* and *in vivo*,” *FEBS Open Bio*, Vol. 12, No. 4, pp. 835-851, April 2022.
[Also highlighted on EurekAlert!(AAAS)]
3. Koji Yamashita, Hirohito Sawahata, Shota Yamagiwa, Shohei Yokoyama, Rika Numano, Kowa Koida and **Takeshi Kawano**, “A Floating 5 μm -diameter Needle Electrode on the Tissue for Damage-Reduced Chronic Neuronal Recording in Mice,” *Lab on a Chip*, Vol. 22, No. 4, pp. 747-756, January 2022.
4. Yuto Kita, Shuhei Tsuruhara, Hiroshi Kubo, Hirohito Sawahata, Shota Yamagiwa, Koji Yamashita, Shinnosuke Idogawa, Yu Seikoba, Xian Long Angela Leong, Rika Numano, Kowa Koida and **Takeshi Kawano**, “Three-micrometer-diameter Needle Electrode with an Amplifier for Extracellular *in vivo* Recordings,” *Proceedings of the National Academy of Sciences USA*, Vol. 118, No. 16, e2008233118, April 2021.
[Also highlighted on EurekAlert!(AAAS)]
5. Shinnosuke Idogawa, Koji Yamashita, Rioki Sanda, Rika Numano, Kowa Koida and **Takeshi Kawano**, “A Lightweight, Wireless Bluetooth-low-energy Neuronal Recording System for Mice,” *Sensors and Actuators B*, Vol. 331, 129423, March 2021.
[Also highlighted on EurekAlert!(AAAS)]
6. Shinnosuke Idogawa, Koji Yamashita, Yoshihiro Kubota, Hirohito Sawahata, Rioki Sanda, Shota Yamagiwa, Rika Numano, Kowa Koida and **Takeshi Kawano**, “Coaxial Microneedle-electrode for Multichannel and Local-differential Recordings of Neuronal Activity,” *Sensors and Actuators B*, Vol. 320, 128442, October 2020.
[Also highlighted on EurekAlert!(AAAS)]
7. Koji Yamashita, Hirohito Sawahata, Shota Yamagiwa, Yusuke Morikawa, Rika Numano, Kowa Koida and **Takeshi Kawano**, “Flexible Parylene-thread Bioprobe and the Sewing Method for *in vivo* Neuronal Recordings,” *Sensors and Actuators B* Vol. 316, 127835, August 2020.
8. Yusuke Morikawa, Shota Yamagiwa, Hirohito Sawahata, Rika Numano, Kowa Koida and **Takeshi Kawano**, “Donut-shaped Stretchable Kirigami: Enabling Electronics to Integrate with the Deformable Muscle,” *Advanced Healthcare Materials*, Vol. 8, No. 23, 1900939, December 2019.
[Also selected as inside back cover page article]
[Also highlighted on EurekAlert!(AAAS)]

9. Toru Harigai, Yu Miyamoto, Masafumi Yamano, Tsuyoshi Tanimoto, Yoshiyuki Suda, Hirofumi Takikawa, **Takeshi Kawano**, Mamiko Nishiuchi, Hironao Sakaki, Kiminori Kondo, Satoru Kaneko, Shinsuke Kunitsugu, “Self-supporting Tetrahedral Amorphous Carbon Films Consisting of Multilayered Structure Prepared using Filtered Arc Deposition,” *Thin Solid Films*, Vol. 675, pp. 123-127, April 2019.
10. Taiki Yasui, Shota Yamagiwa, Hirohito Sawahata, Shinnosuke Idogawa, Yoshihiro Kubota, Yuto Kita, Koji Yamashita, Rika Numano, Kowa Koida and **Takeshi Kawano**, “A Magnetically Assembled High-Aspect-Ratio Needle Electrode for Recording Neuronal Activity,” *Advanced Healthcare Materials*, Vol. 8, No. 5, 1801081, March 2019.
11. Taiki Yasui, Shota Yamagiwa, Hiroshi Kubo, Shinnosuke Idogawa, Yoshihiro Kubota, and **Takeshi Kawano**, “Two-step Poly-Si Through-silicon via for High-temperature Process of Bioprobe,” *IEEE Transactions on Sensors and Micromachines*, Vol. 138, No. 12, pp. 533-538, December 2018.
12. Yoriko Ando, Hirohito Sawahata, **Takeshi Kawano**, Kowa Koida and Rika Numano, “Fiber Bundle Endomicroscopy with Multi-illumination for Three-dimensional Reflectance Image Reconstruction,” *Journal of Biomedical Optics*, Vol. 23, No. 2, 020502, February 2018.
13. Yusuke Morikawa*, Shota Yamagiwa*, Hirohito Sawahata*, Rika Numano, Kowa Koida, Makoto Ishida and **Takeshi Kawano**, “Ultrastretchable Kirigami Bioprobes,” *Advanced Healthcare Materials*, Vol. 7, No. 3, 1701100, February 2018. (*These authors contributed equally to this work)
[Also selected as back cover page article]
[Also highlighted on Advanced Science News]
[Also highlighted on EurekAlert!(AAAS)]
14. Yoshihiro Kubota, Shota Yamagiwa, Hirohito Sawahata, Shinnosuke Idogawa, Shuhei Tsuruhara, Rika Numano, Kowa Koida, Makoto Ishida and **Takeshi Kawano**, “Long Nanoneedle-electrode Devices for Extracellular and Intracellular Recording in vivo,” *Sensors and Actuators B*, Vol. 258, pp. 1287-1294, April 2018.
15. Hirohito Sawahata, Shota Yamagiwa, Airi Moriya, Dong Sheng Teo, Hideo Oi, Yoriko Ando, Rika Numano, Makoto Ishida, Kowa Koida and **Takeshi Kawano**, “Single 5 μm Diameter Needle-electrode Block Modules for Unit Recordings in vivo,” *Scientific Reports*, Vol. 6, 35806, September 2016.
[Also highlighted on EurekAlert!(AAAS)]
16. Yu Miyamoto, Yuma Fujii, Masafumi Yamano, Toru Harigai, Yoshiyuki Suda, Hirofumi Takikawa, **Takeshi Kawano**, Mamiko Nishiuchi, Hironao Sakaki and Kiminori Kondo, “Preparation of Self-supporting Au Thin Films on Perforated Substrate by Releasing from Water-soluble Sacrificial Layer,” *Japanese Journal of Applied Physics*, Vol. 55, No. 7S2, 07LE05, June 2016.
17. Yoshihiro Kubota, Hideo Oi, Hirohito Sawahata, Akihiro Goryu, Yoriko Ando, Rika Numano, Makoto Ishida and **Takeshi Kawano**, “Nanoscale-tipped High-aspect-ratio Vertical Microneedle Electrodes for Intracellular Recordings,” *Small*, Vol. 12, pp. 2846-2853, June 2016.
[Also selected as front cover page article]
[Also highlighted on EurekAlert!(AAAS)]
18. Yoriko Ando, Kowa Koida, Hirohito Sawahata, Takashi Sakurai, Mitsuo Natsume, **Takeshi Kawano** and Rika Numano, “Reflectance Imaging by Fiber Bundle Endoscope: Vertical Reconstruction by Multipositional Illumination,” *AIP Conference Proceedings*, Vol. 1709, 020009, February 2016.

19. M. A. Matin, Akihito Ikedo, **Takeshi Kawano**, Kazuaki Sawada and Makoto Ishida, "Microscale Temperature Sensing using Novel Reliable Silicon Vertical Microprobe Array: Computation and Experiment," *Microelectronics Reliability*, Vol. 55, No. 12, pp. 2689-2697, December 2015.
20. Kenji Okabe, Horagodage Prabhath Jeewan, Shota Yamagiwa, **Takeshi Kawano**, Makoto Ishida and Ippei Akita, "Co-Design Method and Wafer-Level Packaging Technique of Thin-Film Flexible Antenna and Silicon CMOS Rectifier Chips for Wireless-Powered Neural Interface Systems," *Sensors*, Vol. 15, No. 12, pp. 31821-31832, December 2015.
[Also highlighted on EurekAlert!(AAAS)]
21. Satoshi Yagi, Shota Yamagiwa, Yoshihiro Kubota, Hirohito Sawahata, Rika Numano, Tatsuya Imashioya, Hideo Oi, Makoto Ishida and **Takeshi Kawano**, "Dissolvable Base Scaffolds allow Tissue Penetration of High-aspect-ratio Flexible Microneedles," *Advanced Healthcare Materials*, Vol. 4, pp. 1949-1955, September 2015.
[Also selected as inside cover page article]
[Also highlighted on EurekAlert!(AAAS)]
22. Shota Yamagiwa, Makoto Ishida and **Takeshi Kawano**, "Flexible Parylene-film Optical Waveguide Arrays," *Applied Physics Letters*, Vol. 107, 083502, August 2015.
23. Shota Yamagiwa, Akifumi Fujishiro, Hirohito Sawahata, Rika Numano, Makoto Ishida and **Takeshi Kawano**, "Layer-by-layer Assembled Nanorough Iridium-oxide/platinum-black for Low-voltage Microscale Electrode Neurostimulation," *Sensors and Actuators B*, Vol. 206, pp. 205-211, January 2015.
24. Akifumi Fujishiro, Hidekazu Kaneko, Takahiro Kawashima, Makoto Ishida and **Takeshi Kawano**, "In vivo Neuronal Action Potential Recordings via Three-dimensional Microscale Needle-electrode Arrays," *Scientific Reports*, Vol. 4, No. 4868, May 2014.
25. Masahiro Sakata, Tomohiko Nakamura, Tomoyuki Matsuo, Akihiro Goryu, Makoto Ishida and **Takeshi Kawano**, "Vertically Integrated Metal-clad/Silicon Dioxide-shell Microtube Arrays for High-spatial-resolution Light Stimuli in Saline," *Applied Physics Letters*, Vol. 104, 164101, April 2014.
26. Akifumi Fujishiro, Sou Takahashi, Kazuaki Sawada, Makoto Ishida and **Takeshi Kawano**, "Flexible Neural Electrode Arrays with Switch-matrix based on a Planar Silicon Process," *IEEE Electron Device Letters*, Vol. 35, No. 2, pp. 253-255, February 2014.
27. Akihiro Goryu, Rika Numano, Akihito Ikedo, Makoto Ishida and **Takeshi Kawano**, "Nanoscale Tipped Microwire Arrays Enhance Electrical Trap and Depth Injection of Nanoparticles," *Nanotechnology*, Vol. 23, No. 41, 415301, September 2012.
28. **Takeshi Kawano**, Chung Yeung Cho and Liwei Lin, "An Overhanging Carbon Nanotube/parylene Core-shell Nanoprobe Electrode," *Sensors and Actuators A*, Vol. 187, pp. 79-83, November 2012.
29. Akihiro Okugawa, Kotaro Mayumi, Akihito Ikedo, Makoto Ishida and **Takeshi Kawano**, "Heterogeneously Integrated Vapor-liquid-solid Grown Silicon probes/(111) and Silicon MOSFETs/(100)," *IEEE Electron Device Letters*, Vol. 32, No. 5, May 2011.
30. Akihito Ikedo, Makoto Ishida and **Takeshi Kawano**, "Out-of-plane High-density Piezoresistive Silicon Microwire/p-n Diode Array for Force and Temperature Sensitive Artificial Whisker Sensors," *Journal of Micromechanics and Microengineering*, Vol. 21, No. 3, 035007, March 2011.

31. Tetsuhiro Harimoto, Kuniharu Takei, **Takeshi Kawano**, Akito Ishihara, Takahiro Kawashima, Hidekazu Kaneko, Makoto Ishida and Shiro Usui, “Enlarged Gold-tipped Silicon Microprobe Arrays and Signal Compensation for Multi-site Electroretinogram Recordings in the Isolated Carp Retina,” *Biosensors and Bioelectronics*, Vol. 26, No. 5, pp. 2368-2375, January 2011.
32. Akihiro Goryu, Akihito Ikedo, Makoto Ishida and **Takeshi Kawano**, “Nanoscale Sharpening Tips of Vapor-liquid-solid Grown Silicon Microwire Arrays.” *Nanotechnology*, Vol. 21, No. 12, 125302, March 2010.
33. **Takeshi Kawano**, Tetsuhiro Harimoto, Akito Ishihara, Kuniharu Takei, Takahiro Kawashima, Shiro Usui and Makoto Ishida, “Electrical Interfacing between Neurons and Electronics via Vertically-integrated Sub-4 Micron-diameter Silicon Probe Arrays Fabricated by Vapor-liquid-solid Growth.” *Biosensors and Bioelectronics*, Vol. 25, No. 7, pp. 1809-1815, March 2010.
34. Kuniharu Takei, **Takeshi Kawano**, Takahiro Kawashima, Kazuaki Sawada, Hidekazu Kaneko and Makoto Ishida, “Microtube-based Electrode Arrays for Low Invasive Extracellular Recording with a High Signal-to-noise Ratio.” *Biomedical Microdevices*, Vol. 12, No. 1, pp. 41-48, February 2010.
35. Akihito Ikedo, Takahiro Kawashima, **Takeshi Kawano**, and Makoto Ishida, “Vertically Aligned Silicon Microwire Arrays of Various Lengths by Repeated Selective Vapor-Liquid-Solid Growth of n-type Silicon/n-type Silicon.” *Applied Physics Letters*, Vol. 95, No. 3, 033502, July 2009.
[Also selected as cover image article]
36. Kuniharu Takei, Takahiro Kawashima, **Takeshi Kawano**, Hidekazu Kaneko, Kazuaki Sawada and Makoto Ishida, “Out-of-plane Microtube Arrays for Drug Delivery—Liquid Flow Properties and an Application to the Nerve Block Test.” *Biomedical Microdevices*, Vol. 11, No. 3, pp. 539–545, June 2009.
37. Kuniharu Takei, Takahiro Kawashima, **Takeshi Kawano**, Hidekuni Takao, Kazuaki Sawada and Makoto Ishida, “Integration of Out-of-plane Silicon Dioxide Microtubes, Silicon Microprobes, and On-chip NMOSFETs by Selective Vapor-Liquid-Solid Growth.” *Journal of Micromechanics and Microengineering*, Vol. 18, No. 3, 035033, March 2008.
[Also selected for 2008 Highlights Collection (JMM)]
[Also selected for the February 2008 issue of IOP Select]
38. **Takeshi Kawano**, Heather C. Chiamori, Marcel Suter, Qin Zhou, Brian D. Sosnowchik, and Liwei Lin, “An Electrothermal Carbon Nanotube Gas Sensor.” *Nano Letters*, Vol. 7, No. 12, pp. 3686 -3690, December 2007.
39. **Takeshi Kawano**, Dane Christensen, Supin Chen, Chung Yeung Cho and Liwei Lin, “Formation and Characterization of Silicon/Carbon Nanotube/Silicon Heterojunctions by Local Synthesis and Assembly.” *Applied Physics Letters*, Vol. 89, No. 16, 163510, October 2006.
[Also selected for the October 30, 2006 issue of Virtual Journal of Nanoscale Science & Technology]
40. Md. Shofiqul Islam, Hiroshi Ishino, **Takeshi Kawano**, Hidekuni Takao, Kazuaki Sawada and Makoto Ishida, “Realization of In Situ Doped n-Type and p-Type Si-Microprobe Array by Selective Vapor-Liquid-Solid (VLS) Growth Method.” *Japanese Journal of Applied Physics*, Vol. 44, No. 4B, pp. 2161-2165, April 2005.
41. Makoto Ishida, **Takeshi Kawano**, Masato Futagawa, Yuji Arai, Hidekuni Takao and Kazuaki Sawada, “A Si nano-micro-wire Array on a Si (111) Substrate and Field Emission Device Applications,” *Superlattices and Microstructures*, Vol. 34, No. 3-6, pp.567-575, September-December 2004.

42. **Takeshi Kawano**, Yoshiko Kato, Ryoji Tani, Hidekuni Takao, Kazuaki Sawada and Makoto Ishida, "Selective Vapor-Liquid-Solid Epitaxial Growth of Micro-Si Probe Electrode Arrays with On-chip MOSFETs on Si (111) Substrates," *IEEE Transactions on Electron Devices*, Vol. 51, No. 3, pp. 415-420, March 2004.
43. Yoshiko Kato, **Takeshi Kawano**, Yoshiaki Ito, Hidekuni Takao, Kazuaki Sawada and Makoto Ishida, "Signal Conditioning CMOS Circuits Integrated on Si (111) for Image-Recording Sensor of Neural Activity," *IEEJ Transactions on Sensors and Micromachines*, Vol. 123, No. 9, pp. 363-367, September 2003.
44. **Takeshi Kawano**, Hidekuni Takao, Kazuaki Sawada and Makoto Ishida, "Multichannel 5 × 5-Site 3-Dimensional Si Micro-Probe Electrode Array for Neural Activity Recording," *Japanese Journal of Applied Physics*, Vol. 42 part 1, No. 4B, pp. 2473-2477, April 2003.
45. **Takeshi Kawano**, Yoshiko Kato, Masato Futagawa, Ryoji Tani, Hidekuni Takao, Kazuaki Sawada and Makoto Ishida, "Fabrication and Properties of Ultra Small Si Wire Arrays with Circuits by Vapor-Liquid-Solid Growth," *Sensors and Actuators A*, Vol. 97-98, pp. 709-715, April 2002.

International Conference Papers

1. Koji Yamashita, Hirohito Sawahata, Shota Yamagiwa, Rika Numano, Kowa Koida, and **Takeshi Kawano**, "Floating 5- μ m-Diameter Needle for Low Invasive Chronic Recording," **2019 20th International Conference on Solid-State Sensors, Actuators and Microsystems & Eurosensors XXXIII (TRANSDUCERS & EUROSENSORS XXXIII)**, June 2019.
2. Yuta Kotani, Hirohito Sawahata, Shota Yamagiwa, Rika Numano, Kowa Koida and **Takeshi Kawano**, "A High-Density Array of 3D Microneedle-Electrodes for Evaluation of Spatial Resolution of Neuronal Activity," **2019 20th International Conference on Solid-State Sensors, Actuators and Microsystems & Eurosensors XXXIII (TRANSDUCERS & EUROSENSORS XXXIII)**, June 2019.
3. Shinnosuke Idogawa, Yoshihiro Kubota, Shota Yamagiwa, Hirohito Sawahata, Rika Numano, Kowa Koida and **Takeshi Kawano**, "Three Dimensional Core-Shell Microneedle-Electrode for Multisite Neuronal Recording," **2019 20th International Conference on Solid-State Sensors, Actuators and Microsystems & Eurosensors XXXIII (TRANSDUCERS & EUROSENSORS XXXIII)**, June 2019.
4. Shuhei Tsuruhara, Yoshihiro Kubota, Hiroshi Kubo, Hirohito Sawahata, Shota Yamagiwa, Shinnosuke Idogawa and **Takeshi Kawano**, "Nanoneedle-Electrode Array Packaged with Amplifiers for Recording Biological-Signals with A High Voltage Gain," **2019 20th International Conference on Solid-State Sensors, Actuators and Microsystems & Eurosensors XXXIII (TRANSDUCERS & EUROSENSORS XXXIII)**, June 2019.
5. Yusuke Morikawa, Suleman Ayub, Oliver Paul, **Takeshi Kawano** and Patrick Ruther, "Highly Stretchable Kirigami Structure with Integrated Led Chips and Electrodes for Optogenetic Experiments on Perfused Hearts," **2019 20th International Conference on Solid-State Sensors, Actuators and**

Microsystems & Eurosensors XXXIII (TRANSDUCERS & EUROSensors XXXIII), June 2019.

6. Koji Yamashita, Hirohito Sawahata, Shota Yamagiwa, Yusuke Morikawa, Rika Numano, Kowa Koida and **Takeshi Kawano**, “Sewing bioprobe,” **IEEE International Conference on Micro Electro Mechanical Systems (MEMS)**, January 2019.
7. Shota Yamagiwa, Hirohito Sawahata, Rika Numano, Makoto Ishida, Makoto Ishida, Kowa Koida, Kowa Koida and **Takeshi Kawano**, “Dissolvable material-sheathed microneedle-electrode device slid into a narrow gap of the brain,” **IEEE International Conference on Micro Electro Mechanical Systems (MEMS)**, January 2018.
8. Yuto Kita, Hiroshi Kubo, Hirohito Sawahata, Shota Yamagiwa, Xian Long, Angela Leong, Rika Numano, Kowa Koida, Makoto Ishida and **Takeshi Kawano**, “Single needle electrode-topped amplifier package (STACK) for in vivo applications,” **IEEE International Conference on Micro Electro Mechanical Systems (MEMS)**, January 2018.
9. Yusuke Morikawa, Shota Yamagiwa, Hirohito Sawahata, Rika Numano, Kowa Koida, Makoto Ishida and **Takeshi Kawano**, “Stretchable micro-doughnuts Kirigami bioprobe,” **IEEE International Conference on Micro Electro Mechanical Systems (MEMS)**, January 2018.
[Also selected for Student Paper Award Finalist]
10. Yoshihiro Kubota, Rika Numano, Akihiro Goryu, Hirohito Sawahata, Shota Yamagiwa, Minako Matsuo, Makoto Ishida and **Takeshi Kawano**, “Long nanowire arrays for in vitro and in vivo DNA injections into cells in brain tissues,” **IEEE International Conference on Micro Electro Mechanical Systems (MEMS)**, January 2018.
11. Shota Yamagiwa, Hirohito Sawahata, Rika Numano, Rika Numano, Makoto Ishida, Makoto Ishida, Kowa Koida, Kowa Koida and **Takeshi Kawano**, “In vivo neuronal recordings using three-dimensional microneedle-electrode assembled on flexible substrate,” **2017 20th International Conference on Solid-State Sensors, Actuators and Microsystems & Eurosensors XXXIII (TRANSDUCERS & EUROSensors XXXIII)**, June 2017.
12. Shota Yamagiwa, Hirohito Sawahata, Hideo Oi, Rika Numano, Makoto Ishida, Kowa Koida, and **Takeshi Kawano**, “Ultra high-aspect-ratio neuroprobe: 5- μm -diameter and 400- μm -length Needle Detects Action Potentials in vivo,” **IEEE International Conference on Micro Electro Mechanical Systems (MEMS)**, January 2017.
13. Yusuke Seki, Shota Yamagiwa, Yusuke Morikawa, Hirohito Sawahata, Rika Numano, Makoto Ishida, and **Takeshi Kawano**, “Hook and loop microfastener: flexible microelectrodes tied to a nerve,” **IEEE International Conference on Micro Electro Mechanical Systems (MEMS)**, January 2017.
[Also selected for Student Paper Award Finalist]
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