

James K. Gimzewski 2025

Publications and selected Patents

2025.

“Ionic nanoarchitectonics for electronic information devices”

K. Terabe, T. Tsuchiya, T. Tsuruoka, H. Tanaka, I. Valov, J. K. Gimzewski, T. Hasegawa
Volume 430, November 2025, 116995, 29 pages

2024.

352. “Thermally Stable Ag₂Se Nanowire Network as an Effective In-Materio Physical Reservoir Computing Device”

T. Kotooka, S. Lilak, A. Z. Stieg, J. K. Gimzewski, N. Sugiyama, Y. Tanaka, T. Kawabata, A. Karacali, H. Tamukoh, Y. Usami, H. Tanaka
Advanced Electronic Materials
10, Issue 12, 2400443-2400453, 2024

351. “The Radical Atom: Mechanosynthetic 3D Printing of an Atomically Precise SPM Tip”

A.Z. Stieg, J.K. Gimzewski
Department of Energy Report, DOE-UCLA--0008308-1, 2024

350. “Advanced Interferometry with 3-D Structured Illumination Reveals the Surface Fine Structure of Complex Biospecimens”

T.Matsuzaki, R. Kawamura, A.Yamamoto, H. Takahashi, M.Fujii, S.Togo, Y.Yoneyama, F. Hakuno, S. Takahashi, M. Suganuma. S. Nakahavachi S. Sharma, J. K. Gimzewski, and H.Y. Yoshikawa*
The Journal of Physical Chemistry Letters 2024, 15, 4, 1097-1104

2023.

349. “Online dynamical learning and sequence memory with neuromorphic nanowire networks.”

R. Zhu, S. Lilak, A. Loeffler, J. Lizier, A. Stieg, J. Gimzewski, Z.Kuncic
Nat Commun 14, 6697 (2023).

348. “Reservoir Computing with Neuromorphic Nanowire Networks”

R. Zhu, S. Lilak, A. Loeffler, J. Lizier, A. Stieg, J. Gimzewski, Z.Kuncic
Proceedings of Neuromorphic Materials, Devices, Circuits and Systems (NeuMatDeCaS)
VALÈNCIA, Spain, 2023.

347, Victoria Vesna; James K. Gimzewski, "NANO: Bottom up and in Between," in “Doors to Hidden Worlds: The Power of Visualization in Science, Media, and Art”

Book Chapter De Gruyter Edition Angewandte series, Editors, A. Vendl and M. R. Fröschl, pp.253-268.2023

346. “Metal doped polyaniline as neuromorphic circuit elements for in-material computing”
R Higuchi, S Lilak, HO Sillin, T Tsuruoka, M Kunitake, T Nakayama, JK Gimzewski,
AZ Stieg
Science and Technology of Advanced Materials 24 (1), 2178815, 2023
345. “Controlled Vertical Transfer of Individual Au Atoms Using a Surface Supported Carbon
Radical for Atomically Precise Manufacturing”
P Bothra, AZ Stieg, JK Gimzewski, P Sautet
Precision Chemistry 1 (2), 119-126, 2023

2022

344. “Focus on disordered, self-assembled neuromorphic systems”
Z Kuncic, T Nakayama, J Gimzewski
Neuromorphic Computing and Engineering 2 (4), 040201, 2022
343. “Cardio PyMEA: A user-friendly, open-source Python application for cardiomyocyte
microelectrode array analysis”
Christopher S Dunham, Madelynn E Mackenzie, Haruko Nakano, Alexis R Kim, Atsushi
Nakano, Adam Z Stieg, James K Gimzewski
Plos one 17 (5), e0266647, 2022
342. “Emergence of in-material intelligence from an incidental structure of a single-walled
carbon nanotube–porphyrin polyoxometalate random network”
Deep Banerjee, Takumi Kotooka, Saman Azhari, Yuki Usami, Takuji Ogawa, James K
Gimzewski, Hakaru Tamukoh, Hirofumi Tanaka
Advanced Intelligent Systems 4 (4), 2100145, 2022
341. “Pacemaker translocations and power laws in 2D stem cell-derived cardiomyocyte
cultures”
Christopher S Dunham, Madelynn E Mackenzie, Haruko Nakano, Alexis R Kim, Michal
B Juda, Atsushi Nakano, Adam Z Stieg, James K Gimzewski
Plos one 17 (3), e0263976 2022

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340. “Cancer cell mechanobiology: A new frontier for cancer research”
W Yu, S Sharma, E Rao, AC Rowat, JK Gimzewski, D Han, J Rao
Journal of the National Cancer Center 2 (1), 10-17, 2021
339. “Nonequilibrium lateral force and torque by thermally excited nonreciprocal surface
electromagnetic waves”

Chinmay Khandekar, Siddharth Buddhiraju, Paul R. Wilkinson, James K. Gimzewski, Alejandro W. Rodriguez, Charles Chase, and Shanhui Fa
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338. “Nanoscale neuromorphic networks and criticality: a perspective”
Christopher S Dunham, Sam Lilak, Joel Hochstetter, Alon Loeffler, Ruomin Zhu, Charles Chase, Adam Z Stieg, Zdenka Kuncic, James K Gimzewski,
J. Phys. Complex. 2 04200, 2021
337. Nanoscale Extracellular Vesicles Carry the Mechanobiology Signatures of Breast Cancer Cells
Michael LeClaire, James A. Wohlschlegel, Helena Chang, Madhuri Wadehra, Weibo Yu, JianYu Rao, David Elashoff, James K. Gimzewski, Shivani Sharma
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337. Programmable Fading Memory in Atomic Switch Systems for Error Checking Applications
Renato Aguilera, Henry O Sillin, Adam Z Stieg, James K Gimzewski
202, Book “Reservoir Computing” edited by Kohei Nakajima, Ingo Fischer, 273-303, Springer, Singapore
336. A review of the biomechanical properties of single extracellular vesicles.
LeClaire, M, Gimzewski, J, Sharma, S.
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335. Nonequilibrium Casimir effects of nonreciprocal surface waves
C Khandekar, S Buddhiraju, PR Wilkinson, JK Gimzewski, AW Rodriguez, ...
arXiv preprint arXiv:2106.10584, 2021
334. Spoken Digit Classification by In-Materio Reservoir Computing with Neuromorphic Atomic Switch Networks
S Lilak, W Woods, K Scharnhorst, C Dunham, C Teuscher, AZ Stieg, James K Gimzewski
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333. Harnessing adaptive dynamics in neuro-memristive nanowire networks for transfer learning
R Zhu, J Hochstetter, A Loeffler, A Diaz-Alvarez, A Stieg, J Gimzewski, T. Nakayama, Z. Kuncic
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332. Nanomechanical Analysis of Cells from Cancer Patients
SE Cross, YS Jin, J Rao, JK Gimzewski

Nano-Enabled Medical Applications, 547-56, 2020

331. Optical cytometry to determine cell mass changes in response to a biologically active agent, JK Gimzewski, JC Reed, MA Teitell, US Patent 10,802,012
330. Neuromorphic Information Processing with Nanowire Networks
Zdenka Kuncic, Omid Kavehei, Ruomin Zhu, Alon Loeffler, Kaiwei Fu, Joel Hochstetter, Mike Li, James M Shine, Adrian Diaz-Alvarez, Adam Stieg, James Gimzewski, Tomonobu Nakayama
2020 Conference 2020 IEEE International Symposium on Circuits and Systems (ISCAS)
329. Reservoir Computing with Neuromemristive Nanowire Networks
Kaiwei Fu, Ruomin Zhu, Alon Loeffler, Joel Hochstetter, Adrian Diaz-Alvarez, Adam Stieg, James Gimzewski, Tomonobu Nakayama, Zdenka Kuncic
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328. “Single Cell Mechanotype and Associated Molecular Changes in Urothelial Cell Transformation and Progression”
Jianyu Rao, James K Gimzewski, Qing-YiQing-Yi Lu, Shivani Sharma, Chau Ly, Dino Di C arlo, Amy Rowat, Michael LeClaire LeClaire, Donghyuk Kim
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Shivani Sharma, Michael LeClaire, James Wohlschlegel, James Gimzewski
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326. Mitigation of aflatoxin B1-and sodium arsenite-induced cytotoxicities in HUC-PC urinary bladder cells by curcumin and Khaya senegalensis
Jeremiah Olorunjuwon Olugbami, Robert Damoiseaux, Oyeronke Adunni Odunola, James Kazimierz Gimzewski
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325. United States Patent No. : US 10,570,442 B2, Date of Patent : Feb. 25 , 2020
COMPOSITIONS AND METHODS FOR ANALYZING IMMOBILIZED NUCLEIC ACIDS
Inventors: James K. Gimzewski , Bhubaneswar Mishra, Jason C. Reed
324. Monomolecular Covalent Honeycomb Nanosheets Produced by Surface-Mediated

- Polycondensation between 1, 3, 5-Triamino Benzene and Benzene-1, 3, 5-Tricarbox Aldehyde on Au (111)
M Kunitake, R Tanoue, R Higuchi, S Yoshimoto, R Haraguchi, Shinobu Uemura, Nobuo Kimizuka, Adam Z Stieg, James K Gimzewski
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Tohru Tsuruoka, Takeo Ohno, Alpana Nayak, Rui Yang, Tsuyoshi Hasegawa, Kazuya Terabe, James K Gimzewski, Masakazu Aono
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322. Atomic Switch Networks for Neuroarchitectonics: Past, Present, Future
R Aguilera, K Scharnhorst, SL Lilak, CS Dunham, M Aono, AZ Stieg, JK Gimzewski
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S Sharma, R Aguilera, JY Rao, JK Gimzewski
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317. Atomic Force Microscopy for Medicine
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