CV Kaori Sugihara
Updated on 21.01.2022

Kaori Sugihara
Date of birth: 25.07.1983
Nationality: Japanese
Married with two children (*maternity break in 2015 and 2018*)
Email: kaori-s@iis.u-tokyo.ac.jp
Webpage: https://sugiharalab.iis.u-tokyo.ac.jp/

RESEARCH POSITIONS

2020 – present	Lecturer (tenured, independent) Institute of Industrial Science, University of Tokyo, Japan
2014 – 2020	Tenure-track Assistant Professor Department of Physical Chemistry, University of Geneva, Geneva, Switzerland
2012 – 2014	Postdoctoral Researcher (Prof. Joachim P. Spatz) Max Planck Institute for Intelligent Systems, Stuttgart, Germany

EDUCATION

2008 – 2012	Dr of Sciences	ETH Zurich (Prof. Janos Vörös)
2006 – 2008	MEng in Applied Physics	The University of Tokyo
2002 – 2006	BSc in Physics	Keio University

SELECTED PRIZES AND AWARDS

2021	Inoue Research Award
2020	The University of Tokyo Excellent Young Researcher
2013	Humboldt Research Fellowship for Postdoctoral Researchers
2012	Swiss National Science Foundation Fellowships for Prospective Researchers
2013	Education Travel Award for the Annual meeting of the Biophysical Society
2012	Swiss Society of Biomedical Engineering Research Award
2012	ETH Medal
2012	Chorafas-Prize 2012

FUNDING

Project	**KS**			
Develop antimicrobial agents	PI	JST FOREST	2022– 2024	20,000,000 JPY
Double cooperativity	PI	Takeda Sci. F.	2021– 2024	10,000,000 JPY
Nanoforce sensor under liquid	PI	Mitsubishi F.	2021– 2022	4,000,000 JPY
Mask charger	PI	UTokyo GAP	2021	6,000,000 JPY
Antimicrobial peptide	PI	Shiseido Grant	2021 – 2022	1,000,000 JPY
Mechanochromic polymer	PI	UTEC-UTokyo	2021 – 2022	5,000,000 JPY
Polydiacetylene	PI	Inoue Award	2021 – 2022	5,000,000 JPY
Nanoforce sensor	PI	UTokyo EYR	2020 – 2021	6,000,000 JPY
Aminoacid ID cooperative effect	PI	Naito F.	2020 – 2022	6,000,000 JPY
UTokyo Female Startup	PI	UTokyo Startup	2020	1,000,000 JPY
Nanofriction force microscopy	PI	JSPS Startup	2020 – 2021	3,000,000 JPY
Cooperative effect	PI	Kanamori F.	2020	1,000,000 JPY
Nanoforce sensor	PI	IIS Sentei	2020	4,000,000 JPY
N95 mask recharger	PI	IIS COVID-19	2020	1,000,000 JPY
Nanomechanochromism	PI	SNSF	2020 – 2023	316,731 CHF
Human stefin B	PI	COST-SNSF	2020 – 2023	319,961 CHF

NCCR Chemical Biology Phase III	Co-PI	NCCR, SNSF	2019 – 2022	262,007 CHF
A breast-on-a-chip	PI	Hes.so	2019 – 2020	50,000 CHF
Immune peptides	PI	Schmidheiny	2019 – 2021	25,000 CHF
Purchase of a cryoTEM	Co-PI	R'Equip, SNSF	2017 – 2018	950,000 CHF
Mechanosensitive membranes	PI	SNSF	2016 – 2019	204,744 CHF
Nanostructures by lipids	PI	SNSF	2015 – 2020	298,473 CHF
A new mechano-assay	PI	Novartis	2015 – 2018	60,000 CHF
Membrane force sensor	PI	Ernest Boninchi	2015 – 2016	50,000 CHF
A new mechano-assay	PI	Schmidheiny	2015 – 2016	50,000 CHF
A new mechano-assay	PI	COMAD	2015	50,000 CHF
Purchase of a potentiostat	PI	ASG	2015	18,400 CHF
NCCR Chemical Biology Phase II	Co-PI	NCCR, SNSF	2014 – 2018	308,090 CHF
		Total		**Over 3.8 Million USD (as PI 2.2 Million USD)**

NCCR Phase III (Director: Howard Riezman and Christian Heinis), NCCR Phase II (Director: Howard Riezman and Kai Johnsson), China Council (PI: A PhD candidate Jiangtao Zhao), R'Equip (PI: Robbie Loewith), Hes.so is a collaborative project: 20,000 CHF is granted to my group (Co-PI: Mhanna Rami, American University of Beirut, Bassil Marcel, Benta Pharma Industries), COST-SNF in collaboration with Prof. Eva Žerovnik (Research Institute Jožef Stefan, Ljubljana). COST-SNF and Nanomechanochromism (SNF) are cancelled due to the relocation to Japan.

INVITED SEMINARS AND TALKS

2022 Bioanalytical Sensors Gordon Research Conference (postponed)
2022 MRS Spring Meeting, Hawai
2021 NTU ChE & UTokyo CSE Joint Symposium, online
2021 Third IIS – MESA+ Workshop, online
2021 MERIT Seminar, University of Tokyo
2020 Eisai Co., Ltd. Tsukuba research laboratories
2020 Kanamori Foundation Prize Ceremony, online
2020 Department of Chemical Systems Engineering, University of Tokyo
2020 SFB 803-Colloquium, Universität Göttingen
2019 Institute of Industrial Science, University of Tokyo
2019 ISIPS satellite event: Workshop on Bioiontronics, Fukuoka
2019 Campus Straubing, Technical University of Munich (TUM)
2019 EPFL, Institute of Chemistry and Chemical Engineering
2018 University of Fribourg, NCCR Bioinspired Materials
2017 Tokyo Institute of Technology, Department of Innovative and Engineered Materials
2017 The Fifth Japan-Switzerland Workshop on Biomechanics (JSB2017)
2017 10th Young Faculty Meeting, University of Bern
2017 Institute for Bioengineering of Catalonia (IBEC)
2017 Institute of Material Science of Barcelona (ICMAB)
2017 EMPA, Department "Materials Meet Life"
2016 Conference of Geneva Society of Chemistry
2016 Final Presentation for Programme Fondation de Famille Sandoz (short listed)
2015 Metrohm Autolab Meeting
2015 Imperial College London, Department of Bioengineering
2014 ETH Zurich, Department of Chemical Engineering
2013 University of Geneva, Department of Physical Chemistry
2012 Annual Meeting of Swiss Society of Biomedical Engineering
2012 2nd Workshop between MRC-ETH and Chalmers Univ.

PROFESSIONAL SERVICE

Organization of conferences and seminars

- ESF Symposium on Biological Surfaces and Interfaces, Co-vice chair (postponed due to COVID)
- Swiss Soft Day 20 (10.02.2017, Geneva, Switzerland)
  Participants 60 – 70, Co-organized with Dr. Gregor Trefalt and Dr. Kitty van Gruijthuijsen
- NCCR Lecture Series
  Co-organized with Prof. Beat Fierz (EPFL) several times per year both at University of Geneva and at EPFL.

Reviewers of journal articles

Colloids and Surfaces A, The Journal of Physical Chemistry, Langmuir, Scientific Reports, Soft Matter, Lab on a Chip, Small, Sensors and Actuators B, Analytica Chimica Acta, ACS Chemical Biology, Biomacromolecules

Reviewers of proposals

- The Research Foundation Flanders (Belgian Research Grant)

CAREER BREAKS

2018	Maternity leave (5 months from 29.08.2018)
2015	Maternity leave (5 months from 17.08.2015)

LANGUAGES

Japanese	Mother tongue
English	Fluent
German	Basic
French	Basic

JOURNAL ARTICLES

Peer-review original articles unless indicated as (Review)

37. Recent progress in polydiacetylene mechanochromism (Review)
Das, B.; Jo, S.; Zheng, J.; Chen, J.; **Sugihara, K.***
Nanoscale DOI: 10.1039/d1nr07129g

36. Analysis of PDA dose curves for the extraction of antimicrobial peptide properties
Zhao, J.; **Sugihara, K.***
J Phys Chem B **2021**, *125* (44), 12206–12213.

35. Lipid nanotubes as an organic template for the fabrication of carbon nanostructures by pyrolysis
Jajcevic, K.; Sequeira, A. M.; Kalbacova, J. ;Zahn D.R.T.; **Sugihara, K.***
Nanoscale **2021**, *13*, 6927-6933.

34. Quantitative and anisotropic mechanochromism of polydiacetylene at nanoscale
Juhasz, L.; Ortuso, D. R.; **Sugihara, K.***
Nano Letters **2021**, *21* (1), 543-549.

33. Recharging N95 masks by van de Graaff generator for safe recycling
Sugihara, K.*
Soft Matter **2021**, *17* (1), 10-15.

32. Cooperative function of LL-37 and HNP1 protects mammalian cell membranes from lysis and reduces cytotoxicity
Drab, E.; **Sugihara, K.***
Biophysical Journal **2020**, *119* (12), 2440-2450.

31. The mechanism of polydiacetylene blue-to-red transformation induced by antimicrobial peptides
Nuck, J.; **Sugihara, K.***
Macromolecules **2020,** *53* (15), 6469-6475.

30. Lipid nanotubes as an organic template for an electrically-conductive gold nanostructure network
Jajcevic, K.; **Sugihara, K.***
J Phys Chem B **2020,** *124* (27), 5761-5769.

29. Black lipid membranes: challenges in simultaneous quantitative characterization by electrophysiology and fluorescence microscopy
Tsemperouli, M.; Amstad, E.; Sakai, N.; Matile, S.; **Sugihara, K.***
Langmuir **2019,** *35* (26), 8748-8757.

28. The deconvolution analysis of ATR-FTIR spectra of diacetylene during UV exposure
Ortuso, R. D.; Ricardi, N.; Burgi, T.; Wesolowski, T. A.; **Sugihara, K.***
Spectrochim. Acta. A. Mol. Biomol. Spectrosc. **2019,** *219*, 23-32.

27. Anion transport with pnictogen bonds in direct comparison with chalcogen and halogen bonds
Lee, L. M.; Tsemperouli, M.; Poblador-Bahamonde, A. I.; Benz, S.; Sakai, N.; **Sugihara, K.***; Matile, S.*
J. Am. Chem. Soc. **2019,** *141* (2), 810-814.

26. Effect of the nonspecific binding in differential impedance biosensing
Buff, M.; Drab, E.; **Sugihara, K.***
Biointerphases **2019,** *14* (1), 011004.

25. Characterization of di-4-ANEPPS with nano-black lipid membranes
Tsemperouli, M.; **Sugihara, K.***
Nanoscale **2018,** *10* (3), 1090-1098.

24. Detailed study on the failure of the wedge calibration method at nanonewton setpoints for friction force microscopy
Ortuso, R. D.; **Sugihara, K.***
J Phys Chem C **2018,** *122* (21), 11464-11474.

23. Mechanosensitive oligodithienothiophenes: transmembrane anion transport along chalcogen-bonding cascades
Macchione, M.; Tsemperouli, M.; Goujon, A.; Mallia, A. R.; Sakai, N.; **Sugihara, K.**; Matile, S.
Helv. Chim. Acta **2018,** *101* (4).

22. 2018 International symposium on chemical biology of the NCCR Chemical Biology campus biotech, Geneva 10.-12.01.2018 (Conference Report)
Kruse, K.; **Sugihara, K.***
Chimia **2018,** *72* (3), 160-164.

21. Mechanosensitivity of polydiacetylene with a phosphocholine headgroup
Ortuso, R. D.; Cataldi, U.; **Sugihara, K.***
Soft Matter **2017,** *13* (8), 1728-1736.

20. Artificial tubular connections between cells based on synthetic lipid nanotubes
Kozintsev, A.; **Sugihara, K.***
Rsc Adv **2017,** *7* (33), 20700-20708.

19. Self-assembled lipid structures as model systems for studying electrical and mechanical properties of cell membranes (Invited Review)
Sugihara, K.*
Chimia **2016,** *70* (11), 805-809.

18. Gold nanowire fabrication with surface-attached lipid nanotube templates
Jajcevic, K.; Chami, M.; **Sugihara, K.***
Small **2016,** *12* (35), 4830-4836.

17. Combined electrical and optical characterization of polydiacetylene
Girard-Reydet, C.; Ortuso, R. D.; Tsemperouli, M.; **Sugihara, K.***
J Phys Chem B **2016,** *120* (14), 3511-5.

16. Freely drawn single lipid nanotube patterns
Sugihara, K.*; Rustom, A.; Spatz, J. P.
Soft Matter **2015,** *11* (10), 2029-2035.

15. Artificial bacterial flagella for remote-controlled targeted single-cell drug delivery
Mhanna, R.; Qiu, F. M.; Zhang, L.; Ding, Y.; **Sugihara, K.**; Zenobi-Wong, M.; Nelson, B. J.
Small **2014,** *10* (10), 1953-1957.

14. Label-free detection of cell-contractile activity with lipid nanotubes
Sugihara, K.; Delai, M.; Mahnna, R.; Kusch, J.; Poulikakos, D.; Voros, J.; Zambelli, T.; Ferrari, A.
Integrative biology : quantitative biosciences from nano to macro **2013,** *5* (2), 423-30.

13. Switching transport through nanopores with ph-responsive polymer brushes for controlled ion permeability
de Groot, G. W.; Santonicola, M. G.; **Sugihara, K.**; Zambelli, T.; Reimhult, E.; Voros, J.; Vancso, G. J.
Acs Appl Mater Inter **2013,** *5* (4), 1400-1407.

12. Electrically induced lipid migration in non-lamellar phase
Sugihara, K.*; Stucki, J.; Isa, L.; Vörös, J.; Zambelli, T.
J. Colloid Interface Sci. **2012,** *386* (1), 421-427.

11. A universal method for planar lipid bilayer formation by freeze and thaw
Sugihara, K.*; Jang, B.; Schneider, M.; Voros, J.; Zambelli, T.
Soft Matter **2012,** *8* (20), 5525-5531.

10. Simultaneous OWLS and EIS monitoring of supported lipid bilayers with the pore forming peptide melittin
Sugihara, K.*; Delai, M.; Szendro, I.; Guillaume-Gentil, O.; Vörös, J.; Zambelli, T.
Sens. Actuators, B **2012,** *161* (1), 600-606.

9. Directed self-assembly of lipid nanotubes from inverted hexagonal structures
Sugihara, K.*; Chami, M.; Derenyi, I.; Voros, J.; Zambelli, T.
ACS nano **2012,** *6* (8), 6626-32.

8. Electrochemical plasmonic sensors (Review)
Dahlin, A.; Dielacher, B.; Rajendran, P.; **Sugihara, K.**; Sannomiya, T.; Zenobi-Wong, M.; Vörös, J.
Anal. Bioanal. Chem. **2012,** *402* (5), 1773-1784.

7. Techniques for recording reconstituted ion channels (Review)
Demarche, S.; **Sugihara, K.**; Zambelli, T.; Tiefenauer, L.; Voros, J.
Analyst **2011,** *136* (6), 1077-1089.

6. The resistance of polyelectrolyte multilayers in a free-hanging configuration
Sugihara, K.*; Vörös, J.; Zambelli, T.
J. Phys. Chem. B **2010,** *114* (44), 13982-13987.

5. A gigaseal obtained with a self-assembled long-lifetime lipid bilayer on a single polyelectrolyte multilayer-filled nanopore
Sugihara, K.; Vörös, J.; Zambelli, T.
ACS nano **2010,** *4* (9), 5047-5054.

4. Liposome and lipid bilayer arrays towards biosensing applications (Review)
Bally, M.; Bailey, K.; **Sugihara, K.**; Grieshaber, D.; Vörös, J.; Städler, B.
Small **2010,** *6* (22), 2481-2497.

3. Valley-splitting edge-channel transport in a Si/SiGe quantum Hall system
Sugihara, K.; Hamaya, K.; Kawamura, M.; Sawano, K.; Shiraki, Y.; Machida, T.
Physica E **2008,** *40* (5), 1523-1525.

2. Electrical polarization of nuclear spins in a breakdown regime of quantum Hall effect

Kawamura, M.; Takahashi, H.; **Sugihara, K.**; Masubuchi, S.; Hamaya, K.; Machida, T.
Appl. Phys. Lett. **2007,** *90* (2), 022102.

1. Spin-dependent nonlocal resistance in a Si/SiGe quantum Hall conductor
Hamaya, K.; **Sugihara, K.**; Takahashi, H.; Masubuchi, S.; Kawamura, M.; Machida, T.; Sawano, K.; Shiraki, Y.
Phys Rev B **2007,** *75* (3), 033307.

PATENTS

Chip for determination of molecular structures and functions
M. Di Berardino, J. Vörös, **K. Sugihara**, T. Zambelli
International publication number WO 2011/003586 A1

Sensor as biochip
J. Vörös, **K. Sugihara**, T. Zambelli, M. Nirschl
International publication number WO 2011/003583 A1

SELECTED PUBLICITY

Recycling N95 masks by static electricity
ANN News TV Asahi (2020.12.18 10:56)

A shock to the PPE system: Recharging sterile N95 masks
Medicalxpress (2020.12.17)

A Shock to the PPE System
EurekAlert AAAS (2020.12.17)

Protection or Destruction: The LL-37/HNP1 Cooperativity Switch
NEW AND NOTABLE (2020.12.15)
Biophysical Journal **2020**, *119* (12), 2370-2371

Turning adversity into opportunity – UTokyo researcher studies how to recycle N95 masks –
「UTokyo-IIS Bulletin」 Vol. 6 (2020.10.08)

Turning adversity into opportunity – UTokyo researcher studies how to recycle N95 masks –
UTokyo FOCUS “FEATURES” (2020.09.09)