

## Biological Studies with HS-AFM

2020

1. Fan, C., Zhang, P., Liu, X., Liu, P., Wang, F., Ariyama, H., Ando, T., Lin, J., Hu, J., Wang, L., and Li, B. (2020) Capturing transient antibody conformations with DNA origami epitopes. *Nat. Commun.* 11, 3114.
2. Fujioka, Y., Md. Alam, J., Noshiro, D., Mouri, K., Ando, T., Okada, Y., May, A.I., Knorr, R.L., Suzuki, K., Ohsumi, Y., and Noda, N.N. (2020) Phase separation organizes the site of autophagosome formation. *Nature* 678, 301-305.
3. Hirayama, S., Oohora, K., Uchihashi, T., Hayashi, T. (2020) Thermoresponsive Micellar Assembly Constructed from a Hexameric Hemoprotein Modified with Poly(N-isopropylacrylamide) toward an Artificial Light-Harvesting System. *Journal of the American Chemical Society* 142(4), pp. 1822-1831.
4. Kikuchi, Y., Obana, N., Toyofuku, M., Kodera, N., Soma, T., Ando, T., Fukumori, Y., Nomura, N., and Taoka, A. (2020) Diversity of physical properties of bacterial extracellular membrane vesicles revealed through atomic force microscopy phase imaging. *Nanoscale* 12, 7950-7959.
5. Konno, H., Watanabe-Nakayama, T., Uchihashi, T., Okuda, M., Zhu, L., Kodera, N., Kikuchi, Y., Ando, T., Taguchi, H. (2020) Dynamics of oligomer and amyloid fibril formation by yeast prion Sup35 observed by high-speed atomic force microscopy. *Proc. Natl. Acad. Sci. U. S. A.* 117(14), pp. 7831-7836.
6. Lim, K.S., Mohamed, M.S., Wang, H., Hartonoc, Hazawa, M., Kobayashi, A., Voon, D.C.-C., Kodera, N., Ando, T., Wong, R.W. (2020) Direct visualization of avian influenza H5N1 hemagglutinin precursor and its conformational change by high-speed atomic force microscopy. *Biochimica et Biophysica Acta - General Subjects* 1864(2),129313.
7. Lin, Y.-C., Chipot, C., Scheuring, S. (2020) Annexin-V stabilizes membrane defects by inducing lipid phase transition. *Nat. Commun.* 11, 230.
8. Matsuda, K., Sugawa, M., Yamagishi, M., Kodera, N., Yajima, J. (2020) Visualizing dynamic actin cross-linking processes driven by the actin-binding protein anillin. *FEBS Letters* 594(8), pp. 1237-1247.
9. Ni, T., Jiao, F., Yu, X., Aden, S., Ginger, L., Williams, S.I., Bai, F., Pražák, V., Karia, D., Stansfeld, P., Zhang, P., Munson, G., Anderluh, G., Scheuring, S., Gilbert, R.J.C. (2020) Structure and mechanism of bactericidal mammalian perforin-2, an ancient agent of innate immunity. *Science Advances* 6(5), eaax8286.
10. Onoa, B., Fukuda, S., Iwai, M., Bustamante, C., Niyogi, K.K. (2020) Atomic Force Microscopy Visualizes Mobility of Photosynthetic Proteins in Grana Thylakoid Membranes. *Biophysical Journal* 118(8), 1876-1886.

11. Oohora, K., Hirayama, S., Uchihashi, T., Hayashi, T. (2020) Construction of a hexameric hemoprotein sheet and direct observation of dynamic processes of its formation. *Chemistry Letters* 49(2), pp. 186-190.
12. Strasser, J., De Jong, R.N., Beurskens, F.J., Schuurman, J., Parren, P.W.H.I. Hinterdorfer, P., Preiner, J. (2020) Weak Fragment Crystallizable (Fc) Domain Interactions Drive the Dynamic Assembly of IgG Oligomers upon Antigen Recognition. *ACS Nano* 14(3), pp. 2739-2750.
13. Tatebe, H., Lim, C.T., Konno, H., Shiozaki, K., Shinohara, A., Uchihashi, T., Furukohri, A. (2020) Rad50 zinc hook functions as a constitutive dimerization module interchangeable with SMC hinge. *Nat. Commun.* 11, 370.
14. Terashima, H., Hirano, K., Inoue, Y., Tokano, T., Kawamoto, A., Kato, T., Yamaguchi, E., Namba, K., Uchihashi, T., Kojima, S., Homma, M. Assembly mechanism of a supramolecular MS-ring complex to initiate bacterial flagellar biogenesis in *Vibrio* species. (2020), *Journal of Bacteriology*, in press. doi:10.1128/JB.00236-20
15. Ueno, T., Niwase, K., Tsubokawa, D., Kikuchi, K., Takai, N., Furuta, T., Kawano, R., Uchihashi, T. (2020) Dynamic behavior of an artificial protein needle contacting a membrane observed by high-speed atomic force microscopy. *Nanoscale* 12(15), 8166-8173.
16. Xin, Y., Ji, X., Grundmeier, G., Keller, A. Dynamics of lattice defects in mixed DNA origami monolayers. *Nucleic acids research* 48(8), 4041-4051 (2020).
17. Yagi-Utsumi, M., Sikdar, A., Song, C., Park, J., Inoue, R., Watanabe, H., Burton-Smith, R.N., Kozai, T., Suzuki, T., Kodama, A., Ishii, K., Yagi, H., Satoh, T., Uchiyama, S., Uchihashi, T., Joo, K., Lee, Sugiyama, M., Murata, K., Kato, K. Supramolecular tholos-like architecture constituted by archaeal proteins without functional annotation. *Sci. Rep.* 10(1),1540 (2020).
18. Yanaka, S., Yogo, R., Watanabe, H., Taniguchi, Y., Satoh, T., Komura, N., Ando, H., Yagi, H., Yuki, N., Uchihashi, T., Kato, K. (2020) On-membrane dynamic interplay between anti-GM1 IgG antibodies and complement component C1q. *International Journal of Molecular Sciences*, 21(1),147.
19. Yilmaz, N., Kodama, Y., Numata, K. (2020) Revealing the Architecture of the Cell Wall in Living Plant Cells by Bioimaging and Enzymatic Degradation. *Biomacromolecules* 21(1), pp. 95-103.
20. Visootsat, A., Nakamura, A., Vignon, P., (Watanabe, H., Uchihashi, T., Iino, R. (2020) Single-molecule imaging analysis reveals the mechanism of a high-catalytic-activity mutant of chitinase A from *Serratia marcescens*. *Journal of Biological Chemistry* 295(7), pp. 1915-1925.

#### **Review Articles**

21. Uchihashi, T., Ganser, C. (2020) Recent advances in bioimaging with high-speed atomic force microscopy. *Biophys. Rev.* 12(2), pp. 363-369.

## 2019

1. Fujita K., Ohmachi M., Ikezaki K., Yanagida T., Iwaki M. (2019) Direct visualization of human myosin II force generation using DNA origami-based thick filaments. *Commun. Biol.* 2, 437.
2. Cho, C., Jang, J., Kang, Y., Watanabe, H., Uchihashi, T., Kim, S.J., Kato, K., Lee, J.Y., Song, J.-J. (2019) Structural basis of nucleosome assembly by the Abo1 AAA+ ATPase histone chaperone. *Nature Communications* 10(1),5764.
3. Ewald, M., Henry, S., Lambert, E., Feuillie, C., Bobo, C., Cullin, C., Lecomte, S., Molinari, M. (2019) High speed atomic force microscopy to investigate the interactions between toxic A $\beta$  1-42 peptides and model membranes in real time: Impact of the membrane composition. *Nanoscale*, 11(15), pp. 7229-7238.
4. Faulkner, M., Zhao, L.-S., Barrett, S., Liu, L.-N. (2019) Self-Assembly Stability and Variability of Bacterial Microcompartment Shell Proteins in Response to the Environmental Change. *Nanoscale Research Letters*, 14, 54.
5. Feng, L., Watanabe, H., Molino, P., Wallace, G.G., Phung, S.L. Uchihashi, T., Higgins, M.J. (2019) Dynamics of Inter-Molecular Interactions Between Single A $\beta$ <sub>42</sub> Oligomeric and Aggregate Species by High-Speed Atomic Force Microscopy. *Journal of Molecular Biology*, 431(15), pp. 2687-2699.
6. Haruyama, T., Sugano, Y., Kodera, N., Uchihashi, T., Ando, T., Tanaka, Y., Konno, H., Tsukazaki, T. (2019) Single-Unit Imaging of Membrane Protein-Embedded Nanodiscs from Two Oriented Sides by High-Speed Atomic Force Microscopy. *Structure*, 27(1), pp. 152-160.
7. Ganser, C., Uchihashi, T. (2019) Microtubule self-healing and defect creation investigated by in-line force measurements during high-speed atomic force microscopy imaging. *Nanoscale*, 11(1), pp. 125-135.
8. Inoue, Y., Ogawa, Y., Kinoshita, M., Terahara, N., Shimada, M., Kodera, N., Ando, T., Namba, K., Kitao, A., Imada, K., Minamino, T. (2019) Structural Insights into the Substrate Specificity Switch Mechanism of the Type III Protein Export Apparatus. *Structure*, 27(6), pp. 965-976.
9. Kakinen, A., Xing, Y., Hegoda Arachchi, N., Javed, I., Feng, L., Faridi, A., Douek, A.M., Sun, Y., Kaslin, J., Davis, T.P., Higgins, M.J., Ding, F., Ke, P.C. (2019) Single-Molecular Heteroamyloidosis of Human Islet Amyloid Polypeptide. *Nano Letters*, 19(9), pp. 6535-6546.
10. Lin, Y.-C., Guo, Y.R., Miyagi, A., Levring, J., MacKinnon, R., Scheuring, S. (2019) Force-induced conformational changes in PIEZO1. *Nature*, 573(7773), pp. 230-234.
11. Maity, S., Caillat, C., Miguet, N., Sulbaran, G., Effantin, G., Schoehn, G., Roos, W.H., Weissenhorn, W. (2019) VPS4 triggers constriction and cleavage of ESCRT-III helical filaments. *Science Advances*, 5(4), eaau7198.
12. Maruyama, S., Suzuki, K., Imamura, M., Sasaki, H., Matsunami, H., Mizutani, K., Saito, Y., Imai, F.L., Ishizuka-Katsura, Y., Kimura-Someya, T., Shirouzu, M., Uchihashi, T., Ando, T., Yamato, I., Murata, T. (2019) Metastable asymmetrical structure of a shaftless V 1 motor. *Science Advances*, 5(1), eaau8149.

13. Matusovsky, O.S., Mansson, A., Persson, M., Cheng, Y.-S., Rassier, D.E. (2019) High-speed AFM reveals subsecond dynamics of cardiac thin filaments upon Ca<sup>2+</sup> activation and heavy meromyosin binding. *Proceedings of the National Academy of Sciences of the United States of America*, 116(33), pp. 16384-16393.
14. Nievergelt, A.P., Kammer, C., Brillard, C., Kurisinkal, E., Bastings, M.M.C., Karimi, A., Fantner, G.E. (2019) Large-Range HS-AFM Imaging of DNA Self-Assembly through In Situ Data-Driven Control. *Small Methods*, 3(7),1900031.
15. Okumura, M., Noi, K., Kanemura, S., Kinoshita, M., Saio, T., Inoue, Y., Hikima, T., Akiyama, S., Ogura, T., Inaba, K. (2019) Dynamic assembly of protein disulfide isomerase in catalysis of oxidative folding. *Nature Chemical Biology*, 15(5), pp. 499-509.
16. Oohora, K., Kajihara, R., Fujimaki, N., Uchihashi, T., Hayashi, T. (2019) A Ring-shaped Hemoprotein Trimer Thermodynamically Controlled by the Supramolecular Heme–Heme Pocket Interaction., *Chemical Communications* 55, 1544-1547.
17. Owa, M., Uchihashi, T., Yanagisawa, H.-A., Yamano, T., Iguchi, H., Fukuzawa, H., Wakabayashi, K.-I., Ando, T., Kikkawa, M. (2019) Inner lumen proteins stabilize doublet microtubules in cilia and flagella. *Nature Communications* 10(1),1143.
18. Pan, Y., Shlyakhtenko, L.S., Lyubchenko, Y.L. (2019) Insight into the dynamics of APOBEC3G protein in complexes with DNA assessed by high speed AFM. *Nanoscale Advances*, 1(10), pp. 4016-4024.
19. Parsons, E.S., Stanley, G.J., Pyne, A.L.B., Hodel, A.W., Nievergelt, A.P., Menny, A., Yon, A.R., Rowley, A., Richter, R.P., Fantner, G.E., Bubeck, D., Hoogenboom, B.W. (2019) Single-molecule kinetics of pore assembly by the membrane attack complex. *Nature Communications*, 10(1), 2066.
20. Ramakrishnan, S., Shen, B., Kostianen, M.A., Grundmeier, G., Keller, A., Linko, V. (2019) Real-Time Observation of Superstructure-Dependent DNA Origami Digestion by DNase I Using High-Speed Atomic Force Microscopy. *ChemBioChem* 20(22), pp. 2818-2823.
21. Raghavan, G., Hidaka, K., Sugiyama, H., Endo, M. (2019) Direct Observation and Analysis of the Dynamics of the Photoresponsive Transcription Factor GAL4. *Angewandte Chemie - International Edition*, 58(23), pp. 7626-7630.
22. Rangl, M., Schmandt, N., Perozo, E., Scheuring, S. (2019) Real time dynamics of gating-related conformational changes in CorA. *eLife*, 8,e47322.
23. Rico, F., Russek, A., González, L., Grubmüller, H., Scheuring, S. (2019) Heterogeneous and rate-dependent streptavidin–biotin unbinding revealed by high-speed force spectroscopy and atomistic simulations. *Proceedings of the National Academy of Sciences of the United States of America*, 116(14), pp. 6594-6601.
24. Sahoo, B.R., Genjo, T., Nakayama, T.W., Stoddard, A.K., Ando, T., Yasuhara, K., Fierke, C.A., Ramamoorthy, A. (2019) A cationic polymethacrylate-copolymer acts as an agonist for  $\beta$ -amyloid and an antagonist for amylin fibrillation. *Chemical Science*, 10(14), pp. 3976-3986.

25. Sakai, K., Passioura, T., Sato, H., Ito, K., Furuhashi, H., Umitsu, M., Takagi, J., Kato, Y., Mukai, H., Warashina, S., Zouda, M., Watanabe, Y., Yano, S., Shibata, M., Suga, H., Matsumoto, K. (2019) Macrocyclic peptide-based inhibition and imaging of hepatocyte growth factor. *Nature Chemical Biology*, 15(6), pp. 598-606.
26. Sekiguchi, T., Satoh, T., Kurimoto, E., Son, C., Kozai, T., Watanabe, H., Ishii, K., Yagi, H., Yanaka, S., Uchiyama, S., Uchihashi, T., Murata, K., Kato, K. (2019) Mutational and combinatorial control of self-assembling and disassembling of human proteasome  $\alpha$ -subunits. *International Journal of Molecular Sciences*, 20, 2608.
27. Shihoya, W., Inoue, K., Singh, M., Konno, M., Hososhima, S., Yamashita, K., Ikeda, K., Higuchi, A., Izume, T., Okazaki, S., Hashimoto, M., Mizutori, R., Tomida, S., Yamauchi, Y., Abe-Yoshizumi, R., Katayama, K., Tsunoda, S. P., Shibata, M., Furutani, Y., Pushkarev, A., B  j  , O., Uchihashi, T., Kandori, H., Nureki, O. (2019) Crystal structure of heliorhodopsin. *Nature* 574, 132-136.
28. Sone, E., Noshiro, D., Ikebuchi, Y., Nakagawa, M., Khan, M., Tamura, Y., Ikeda, M., Oki, M., Murali, R., Fujimori, T., Yoda, T., Honma, M., Suzuki, H., Ando, T., Aoki, K. (2019) The induction of RANKL molecule clustering could stimulate early osteoblast differentiation. *Biochemical and Biophysical Research Communications*, 509(2), pp. 435-440.
29. Stanley, G.J., Akpınar, B., Shen, Q., Fisher, P.D.E., Lusk, C.P., Lin, C., Hoogenboom, B.W. (2019) Quantification of Biomolecular Dynamics Inside Real and Synthetic Nuclear Pore Complexes Using Time-Resolved Atomic Force Microscopy. *ACS Nano*, 13(7), pp. 7949-7956.
30. Strasser, J., De Jong, R.N., Beurskens, F.J., Wang, G., Heck, A.J.R., Schuurman, J., Parren, P.W.H.I., Hinterdorfer, P., Preiner, J. (2019) Unraveling the Macromolecular Pathways of IgG Oligomerization and Complement Activation on Antigenic Surfaces. *Nano Letters*, 19(7), pp. 4787-4796.
31. Sumino, A., Sumikama, T., Uchihashi, T., Oiki, S. (2019) High-speed AFM reveals accelerated binding of agitoxin-2 to a K<sup>+</sup> channel by induced fit. *Science Advances*, 5(7), eaax0495.
32. Tashiro, R., Taguchi, H., Hidaka, K., Endo, M., Sugiyama, H. (2019) Effects of Physical Damage in the Intermediate Phase on the Progression of Amyloid  $\beta$  Fibrillization. *Chemistry - An Asian Journal* 14(23), pp. 4140-4145.
33. Xing, X., Feng, Y., Yu, Z., Hidaka, K., Liu, F., Ono, A., Sugiyama, H., Endo, M. (2019) Direct Observation of the Double-Stranded DNA Formation through Metal Ion-Mediated Base Pairing in the Nanoscale Structure. *Chemistry - A European Journal*, 25(6), pp. 1446-1450.
34. Yamauchi, S., Kobashigawa, Y., Fukuda, N., Teramoto, M., Toyota, Y., Liu, C., Ikeguchi, Y., Sato, T., Sato, Y., Kimura, H., Masuda, T., Ohtsuki, S., Noi, K., Ogura, T., Morioka, H. (2019) Cyclization of single-chain Fv antibodies markedly suppressed their characteristic aggregation mediated by inter-chain VH-VL interactions. *Molecules*, 24(14), 2620.
35. Yogo, R., Yamaguchi, Y., Watanabe, H., Yagi, H., Satoh, T., Nakanishi, M., Onitsuka, M., Omasa, T., Shimada, M., Maruno, T., Torisu, T., Watanabe, S., Higo, D., Uchihashi, T., Yanaka,

S., Uchiyama, S., Kato, K. (2019) The Fab portion of immunoglobulin G contributes to its binding to Fcγ receptor III. *Scientific Reports* 9(1),11957.

### Review Articles

36. Ando, T. (2019) High-speed atomic force microscopy. *Current Opinion in Chemical Biology*, 51, pp. 105-112.
37. Heath, G.R., Scheuring, S. (2019) Advances in high-speed atomic force microscopy (HS-AFM) reveal dynamics of transmembrane channels and transporters. *Current Opinion in Structural Biology*, 57, pp. 93-102.
38. Valotteau, C., Sumbul, F., Rico, F. (2019) High-speed force spectroscopy: microsecond force measurements using ultrashort cantilevers. *Biophysical Reviews*, 11(5), pp. 689-699.

### Method & Protocol Articles

42. Endo, M. (2019) AFM-based single-molecule observation of the conformational changes of DNA structures. *Methods* 169, pp. 3-10.
43. Endo, M., Xing, X., Sugiyama, H. (2019) Direct Observation of the Formation and Dissociation of Double-Stranded DNA Containing G-Quadruplex/i-Motif Sequences in the DNA Origami Frame Using High-Speed AFM. *Methods in Molecular Biology*, 2035, pp. 299-308.
44. Nasrallah, H., Vial, A., Pocholle, N., Soulier, J., Costa, L., Godefroy, C., Bourillot, E., Lesniewska, E., Milhiet, P.-E. (2019) Imaging artificial membranes using high-speed atomic force microscopy. *Methods in Molecular Biology*, 1886, pp. 45-59.

## 2018

1. Brouns, T., De Keersmaecker, H., Konrad, S.F., Kodera, N., Ando, T., Lipfert, J., De Feyter, S., Vanderlinden, W. (2018) Free Energy Landscape and Dynamics of Supercoiled DNA by High-Speed Atomic Force Microscopy. *ACS Nano*, 12(12), pp. 11907-11916.
2. Charoenwattanasatien, R., Tanaka, H., Zinzus, K., Hochmal, A.K., Mutoh, R., Yamamoto, D., Hippler, M., Kurisu, G. (2018) X-ray crystallographic and high-speed AFM studies of peroxiredoxin 1 from *Chlamydomonas reinhardtii*. *Acta Crystallographica Section F: Structural Biology Communications*, 74(2), pp. 86-91.
3. Emilsson, G., Sakiyama, Y., Malekian, B., Xiong, K., Adali-Kaya, Z., Lim, R.Y.H., Dahlin, A.B. (2018) Gating Protein Transport in Solid State Nanopores by Single Molecule Recognition. *ACS Central Science*, 4(8), pp. 1007-1014.
4. Fisher, P.D.E., Shen, Q., Akpınar, B., Davis, L.K., Chung, K.K.H., Baddeley, D., Šarić, A., Melia, T.J., Hoogenboom, B.W., Lin, C., Lusk, C.P. (2018) Programmable DNA Origami Platform for Organizing Intrinsically Disordered Nucleoporins within Nanopore Confinement. *ACS Nano*, 12(2), pp. 1508-1518.
5. Haruyama, T., Uchihashi, T., Yamada, Y., Kodera, N., Ando, T., Konno, H. (2018) Negatively charged lipids are essential for functional and structural switch of human 2-Cys peroxiredoxin II. *J. Mol. Biol.* 430(5), 602-610.

6. Heath, G.R., Scheuring, S. (2018) High-speed AFM height spectroscopy reveals  $\mu$ s-dynamics of unlabeled biomolecules. *Nature Communications*, 9(1),4983.
7. Kielar, C., Ramakrishnan, S., Fricke, S., Grundmeier, G., Keller, A. (2018) Dynamics of DNA Origami Lattice Formation at Solid-Liquid Interfaces. *ACS Applied Materials and Interfaces*, 10(51), pp. 44844-44853.
8. Lee, A.J., Endo, M., Hobbs, J.K., Wälti, C. (2018) Direct Single-Molecule Observation of Mode and Geometry of RecA-Mediated Homology Search. *ACS Nano*, 12(1), pp. 272-278.
9. Marchesi, A., Gao, X., Adaixo, R., Rheinberger, J., Stahlberg, H., Nimigean, C., Scheuring, S. (2018) An iris diaphragm mechanism to gate a cyclic nucleotide-gated ion channel. *Nature Communications*, 9(1),3978.
10. Maruno, T., Watanabe, H., Yoneda, S., Uchihashi, T., Adachi, S., Arai, K., Sawaguchi, T., Uchiyama, S. (2018) Sweeping of Adsorbed Therapeutic Protein on Prefillable Syringes Promotes Micron Aggregate Generation. *Journal of Pharmaceutical Sciences*, 107(6), pp. 1521-1529.
11. Miyagi, A., Ramm, B., Schwille, P., Scheuring, S. (2018) High-Speed Atomic Force Microscopy Reveals the Inner Workings of the MinDE Protein Oscillator. *Nano Letters*, 18(1), pp. 288-296.
12. Mori, T., Sugiyama, S., Byrne, M., Johnson, C.H., Uchihashi, T., Ando, T. (2018) Revealing circadian mechanisms of integration and resilience by visualizing clock proteins working in real time. *Nature Communications*, 9(1),3245.
13. Nakamura, A., Tasaki, T., Okuni, Y., Song, C., Murata, K., Kozai, T., Hara, M., Sugimoto, H., Suzuki, K., Watanabe, T., Uchihashi, T., Noji, H., Iino, R. (2018) Rate constants, processivity, and productive binding ratio of chitinase A revealed by single-molecule analysis. *Physical Chemistry Chemical Physics*, 20, 3010-3018.
14. Nievergelt, A.P., Brillard, C., Eskandarian, H.A., McKinney, J.D., Fantner, G.E. (2018) Photothermal off-resonance tapping for rapid and gentle atomic force imaging of live cells. *International Journal of Molecular Sciences*, 19(10),2984.
15. Nievergelt, A.P., Banterle, N., Andany, S.H., Gönczy, P., Fantner, G.E. (2018) High-speed photothermal off-resonance atomic force microscopy reveals assembly routes of centriolar scaffold protein SAS-6. *Nature Nanotechnology*, 13(8), pp. 696-701.
16. Noshiro, D., Ando, T. (2018) Substrate protein dependence of GroEL–GroES interaction cycle revealed by high-speed atomic force microscopy imaging. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 373(1749),20170180.
17. Oohora, K., Fujimaki, N., Kajihara, R., Watanabe, H., Uchihashi, T., Hayashi, T. (2018) Supramolecular Hemoprotein Assembly with a Periodic Structure Showing Heme-Heme Exciton Coupling. *Journal of the American Chemical Society*, 140(32), pp. 10145-10148.

18. Ravula, T., Ishikuro, D., Kodera, N., Ando, T., Anantharamaiah, G.M., Ramamoorthy, A. (2018) Real-Time Monitoring of Lipid Exchange via Fusion of Peptide Based Lipid-Nanodiscs. *Chemistry of Materials*, 30(10), pp. 3204-3207.
19. Ruan, Y., Kao, K., Lefebvre, S., Marchesi, A., Corringer, P.-J., Hite, R.K., Scheuring, S. (2018) Structural titration of receptor ion channel GLIC gating by HS-AFM. *Proceedings of the National Academy of Sciences of the United States of America*, 115(41), pp. 10333-10338.
20. Sato, Y., Endo, M., Morita, M., Takinoue, M., Sugiyama, H., Murata, S., Nomura, S.-I.M., Suzuki, Y. (2018) Environment-Dependent Self-Assembly of DNA Origami Lattices on Phase-Separated Lipid Membranes. *Advanced Materials Interfaces*, 5(14), 1800437.
21. Schächtele, M., Hänel, E., Schäffer, T.E. (2018) Resonance compensating chirp mode for mapping the rheology of live cells by high-speed atomic force microscopy. *Applied Physics Letters*, 113(9), 093701.
22. Shibata, M., Inoue, K., Ikeda, K., Konno, M., Singh, M., Kataoka, C., Abe-Yoshizumi, R., Kandori, H., Uchihashi, T. (2018) Oligomeric states of microbial rhodopsins determined by high-speed atomic force microscopy and circular dichroic spectroscopy. *Scientific Reports*, 8(1), 8262.
23. Shionoya, T., Mizuno, M., Tsukamoto, T., Ikeda, K., Seki, H., Kojima, K., Shibata, M., Kawamura, I., Sudo, Y., Mizutani, Y. (2018) High Thermal Stability of Oligomeric Assemblies of Thermophilic Rhodopsin in a Lipid Environment. *Journal of Physical Chemistry B*, 122(27), pp. 6945-6953.
24. Stel, B., Cometto, F., Rad, B., De Yoreo, J.J., Lingenfelder, M. (2018) Dynamically resolved self-assembly of S-layer proteins on solid surfaces. *Chemical Communications*, 54(73), pp. 10264-10267.
25. Stumme-Diers, M.P., Banerjee, S., Hashemi, M., Sun, Z., Lyubchenko, Y.L. (2018) Nanoscale dynamics of centromere nucleosomes and the critical roles of CENP-A. *Nucleic Acids Research*, 46(1), pp. 94-103.
26. Sun, Z., Hashemi, M., Warren, G., Bianco, P.R., Lyubchenko, Y.L. (2018) Dynamics of the Interaction of RecG Protein with Stalled Replication Forks. *Biochemistry*, 57(13), pp. 1967-1976.
27. Suzuki, Y., Sugiyama, H., Endo, M. (2018) Complexing DNA Origami Frameworks through Sequential Self-Assembly Based on Directed Docking. *Angewandte Chemie - International Edition*, 57(24), pp. 7061-7065.
28. Takahashi, H., Rico, F., Chipot, C., Scheuring, S. (2018)  $\alpha$ -Helix Unwinding as Force Buffer in Spectrins. *ACS Nano*, 12(3), pp. 2719-2727.
29. Takeda, T., Kozai, T., Yang, H., Ishikuro, D., Seyama, K., Kumagai, Y., Abe, T., Yamada, H., Uchihashi, T., Ando, T., Takei, K. (2018) Dynamic clustering of dynamin-amphiphysin helices regulates membrane constriction and fission coupled with GTP hydrolysis. *eLife*, 7, e30246. Structural changes,

30. Tanabe, J., Nakano, K., Hirata, R., Himeno, T., Ishimatsu, R., Imato, T., Okabe, H., Matsuda, N. (2018) Totally microperoxidase synthetic-11. *Royal Society Open Science*, 5(5),172311.
31. Terahara, N., Inoue, Y., Kodera, N., Morimoto, Y. V., Uchihashi, T., Imada, K., Ando, T., Namba, K., Minamino, T. (2018) Insight into structural remodeling of the FlhA ring responsible for bacterial flagellar type III protein export. *Sci. Adv.* 4 (4), eaao7054.
32. Tsukamoto, H., Higashi, M., Motoki, H., Watanabe, H., Ganser, C., Nakajo, K., Kubo, Y., Uchihashi, T., Furutani, Y. (2018) Structural properties determining low K affinity of the selectivity filter in the TWIK1 K channel. *Journal of Biological Chemistry*, 293(18), pp. 6969-6984.
33. Uchihashi, T., Watanabe, Y.-H., Nakazaki, Y., Yamasaki, T., Watanabe, H., Maruno, T., Ishii, K., Uchiyama, S., Song, C., Murata, K., Iino, R., Ando, T. (2018) Dynamic structural states of ClpB involved in its disaggregation function. *Nature Communications*, 9(1),2147.
34. Uhlig, M.R., Amo, C.A., Garcia, R. (2018) Dynamics of breaking intermolecular bonds in high-speed force spectroscopy. *Nanoscale*, 10(36), pp. 17112-17116.
35. Umakoshi, T., Udaka, H., Uchihashi, T., Ando, T., Suzuki, M., Fukuda, T. (2018) Quantum-dot antibody conjugation visualized at the single-molecule scale with high-speed atomic force microscopy. *Colloids and Surfaces B: Biointerfaces*, 167, pp. 267-274.
36. Uno, M., Watanabe-Nakayama, T., Konno, H., Akagi, K.-I., Tsutsumi, N., Fukao, T., Shirakawa, M., Ohnishi, H., Tochio, H. (2018) Intramolecular interaction suggests an autosuppression mechanism for the innate immune adaptor protein MyD88. *Chemical Communications*, 54(87), pp. 12318-12321.
37. Yagi-Utsumi, M., Sikdar, A., Kozai, T., Inoue, R., Sugiyama, M., Uchihashi, T., Yagi, H., Satoh, T., Kato, K. (2018) Conversion of functionally undefined homopentameric protein PbaA into a proteasome activator by mutational modification of its C-terminal segment conformation. *Protein Engineering, Design and Selection*, 31(1), pp. 29-36.
38. Yoshida, A., Sakai, N., Uekusa, Y., Imaoka, Y., Itagaki, Y., Suzuki, Y., Yoshimura, S.H. (2018) Morphological changes of plasma membrane and protein assembly during clathrin-mediated endocytosis. *PLoS Biology*, 16(5), e2004786.
39. Yoshimasu, Y., Ikeda, T., Sakai, N., Yagi, A., Hirayama, S., Morinaga, Y., Furukawa, S., Nakao, R. (2018) Rapid Bactericidal Action of Propolis against *Porphyromonas gingivalis*. *Journal of Dental Research*, 97(8), pp. 928-936.
40. Zhang, Y., Hashemi, M., Lv, Z., Williams, B., Popov, K.I., Dokholyan, N.V., Lyubchenko, Y.L. (2018) High-speed atomic force microscopy reveals structural dynamics of  $\alpha$ -synuclein monomers and dimers. *Journal of Chemical Physics*, 148(12),123322.
41. Zou, T., Hashiya, F., Wei, Y., Yu, Z., Pandian, G.N., Sugiyama, H. (2018) Direct Observation of H3–H4 Octasome by High-Speed AFM. *Chemistry - A European Journal*, 24(60), pp. 15998-16002.

## Review Articles

42. Ando, T. High-speed atomic force microscopy and its future prospects. *Biophysical Reviews*, 10(2), pp. 285-292.
43. Endo, M., Sugiyama, H. (2018) DNA origami nanomachines. *Molecules*, 23(7),1766.
44. Lyubchenko, Y.L. (2018) Direct AFM visualization of the nanoscale dynamics of biomolecular complexes. *Journal of Physics D: Applied Physics*, 51(40),403001.
45. Uchihashi, T., Scheuring, S. (2018) Applications of high-speed atomic force microscopy to real-time visualization of dynamic biomolecular processes. *Biochimica et Biophysica Acta - General Subjects*, 1862(2), pp. 229-240.

## Method & Protocol Articles

46. Kodera, N., Ando, T. (2018) Direct imaging of walking myosin V by high-speed atomic force microscopy. *Methods in Molecular Biology*, 1805, pp. 103-122.
47. Nakamura, A., Iino, R. (2018) Visualization of functional structure and kinetic dynamics of cellulases. *Advances in Experimental Medicine and Biology*, 1104, pp. 201-217.
48. Endo, M., Sugiyama, H. (2018) Direct observation of dynamic movement of DNA molecules in DNA origami imaged using high-speed AFM. *Methods in Molecular Biology*, 1814, pp. 213-224.
49. Eskandarian, H.A., Nievergelt, A.P., Fantner, G.E. (2018) Time-resolved imaging of bacterial surfaces using atomic force microscopy. *Methods in Molecular Biology*, 1814, pp. 385-402.
50. Piontek, M.C., Roos, W.H. (2018) Atomic force microscopy: An introduction. *Methods in Molecular Biology*, 1665, pp. 243-258.
51. Rodriguez-Ramos, J., Faulkner, M., Liu, L.-N. (2018) Nanoscale visualization of bacterial microcompartments using atomic force microscopy. *Methods in Molecular Biology*, 1814, pp. 373-383.
52. Satoh, T., Kato, K. (2018) Structural aspects of ER glycoprotein quality-control system mediated by glucose tagging. *Advances in Experimental Medicine and Biology*, 1104, pp. 149-169.
53. Stumme-Diers, M.P., Banerjee, S., Sun, Z., Lyubchenko, Y.L. (2018) Assembly of centromere chromatin for characterization by high-speed time-lapse atomic force microscopy. *Methods in Molecular Biology*, 1814, pp. 225-242.
54. Sumbul, F., Marchesi, A., Takahashi, H., Scheuring, S., Rico, F. (2018) High-speed force spectroscopy for single protein unfolding. *Methods in Molecular Biology*, 1814, pp. 243-264.
55. Uchihashi, T., Watanabe, H., Kodera, N. (2018) Optimum substrates for imaging biological molecules with high-speed atomic force microscopy. *Methods in Molecular Biology*, 1814, pp. 159-179.
56. Watanabe-Nakayama, T., Ono, K. (2018) High-speed atomic force microscopy of individual amyloidogenic protein assemblies. *Methods in Molecular Biology*, 1814, pp. 201-212.

57. Zuttion, F., Redondo-Morata, L., Marchesi, A., Casuso, I. (2018) High-resolution and high-speed atomic force microscope imaging. *Methods in Molecular Biology*, 1814, pp. 181-200.

## 2017

1. Aybeke, E.N., Belliot, G., Lemaire-Ewing, S., Estienney, M., Lacroute, Y., Pothier, P., Bourillot, E., Lesniewska, E. (2017) HS-AFM and SERS Analysis of Murine Norovirus Infection: Involvement of the Lipid Rafts. *Small*, 13(1),1600918.
2. Banerjee, S., Sun, Z., Hayden, E.Y., Teplow, D.B., Lyubchenko, Y.L. (2017) Nanoscale Dynamics of Amyloid  $\beta$ -42 Oligomers as Revealed by High-Speed Atomic Force Microscopy. *ACS Nano*, 11(12), pp. 12202-12209.
3. Benning, F.M.C., Sakiyama, Y., Mazur, A., Bukhari, H.S.T., Lim, R.Y.H., Maier, T. (2017) High-Speed Atomic Force Microscopy Visualization of the Dynamics of the Multienzyme Fatty Acid Synthase. *ACS Nano*, 11(11), pp. 10852-10859.
4. Colom, A., Redondo-Morata, L., Chiaruttini, N., Roux, A., Scheuring, S. (2017) Dynamic remodeling of the dynamin helix during membrane constriction. *Proceedings of the National Academy of Sciences of the United States of America*, 114(21), pp. 5449-5454.
5. Munguira, I.L.B., Takahashi, H., Casuso, I., Scheuring, S. (2017) Lysenin Toxin Membrane Insertion Is pH-Dependent but Independent of Neighboring Lysenins. *Biophysical Journal*, 113(9), pp. 2029-2036.
6. De Santis, E., Alkassam, H., Lamarre, B., Faruqui, N., Bella, A., Noble, J.E., Micale, N., Ray, S., Burns, J.R., Yon, A.R., Hoogenboom, B.W., Ryadnov, M.G. (2017) Antimicrobial peptide capsids of de novo design. *Nature Communications*, 8(1), 2263.
7. Fukuda, N., Noi, K., Weng, L., Kobashigawa, Y., Miyazaki, H., Wakeyama, Y., Takaki, M., Nakahara, Y., Tatsuno, Y., Uchida-Kamekura, M., Suwa, Y., Sato, T., Ichikawa-Tomikawa, N., Nomizu, M., Fujiwara, Ohsaka, F., Saito, T., Maenaka, K., Kumeta, H., Shinya, S., Kojima, C., Ogura, T., Morioka, H. (2017) Production of single-chain Fv antibodies specific for ga-pyridine, an advanced glycation end-product (AGE), with reduced inter-domain motion. *Molecules*, 22(10),1695.
8. Gorle, S., Pan, Y., Sun, Z., Shlyakhtenko, L.S., Harris, R.S., Lyubchenko, Y.L., Vuković, L. (2017) Computational Model and Dynamics of Monomeric Full-Length APOBEC3G. *ACS Central Science*, 3(11), pp. 1180-1188.
9. Harada, H., Onoda, A., Uchihashi, T., Watanabe, H., Sunagawa, N., Samejima, M., Igarashi, K., Hayashi, T. (2017) Interdomain flip-flop motion visualized in flavocytochrome cellobiose dehydrogenase using high-speed atomic force microscopy during catalysis. *Chemical Science*, 8(9), pp. 6561-6565.
10. Karner, A., Nimmervoll, B., Plochberger, B., Klotzsch, E., Horner, A., Knyazev, D.G., Kuttner, R., Winkler, K., Winter, L., Siligan, C., Ollinger, N., Pohl, P., Preiner, J. (2017) Tuning

membrane protein mobility by confinement into nanodomains. *Nature Nanotechnology*, 12(3), pp. 260-266.

11. Keya, J.J., Inoue, D., Suzuki, Y., Kozai, T., Ishikuro, D., Kodera, N., Uchihashi, T., Kabir, A.M.R., Endo, M., Sada, K., Kakugo, A. (2017) High-Resolution Imaging of a Single Gliding Protofilament of Tubulins by HS-AFM. *Scientific Reports*, 7(1),6166.
12. Kobayashi, Y., Misumi, O., Odahara, M., Ishibashi, K., Hirono, M., Hidaka, K., Endo, M., Sugiyama, H., Iwasaki, H., Kuroiwa, T., Shikanai, T., Nishimura, Y. (2017) Holliday junction resolvases mediate chloroplast nucleoid segregation. *Science*, 356(6338), pp. 631-634.
13. Kozai, T., Sekiguchi, T., Satoh, T., Yagi, H., Kato, K., Uchihashi, T. (2017) Two-step process for disassembly mechanism of proteasome  $\alpha 7$  homo-tetradecamer by  $\alpha 6$  revealed by high-speed atomic force microscopy. *Scientific Reports*, 7(1),15373.
14. Kumar, S., Cartron, M.L., Mullin, N., Qian, P., Leggett, G.J., Hunter, C.N., Hobbs, J.K. (2017) Direct Imaging of Protein Organization in an Intact Bacterial Organelle Using High-Resolution Atomic Force Microscopy. *ACS Nano*, 11(1), pp. 126-133.
15. Leung, C., Hodel, A.W., Brennan, A.J., Lukoyanova, N., Tran, S., House, C.M., Kondos, S.C., Whisstock, J.C., Dunstone, M.A., Trapani, J.A., Voskoboinik, I., Saibil, H.R., Hoogenboom, B.W. (2017) Real-time visualization of perforin nanopore assembly. *Nature Nanotechnology*, 12(5), pp. 467-473.
16. Maegawa, K.-I., Watanabe, S., Noi, K., Okumura, M., Amagai, Y., Inoue, M., Ushioda, R., Nagata, K., Ogura, T., Inaba, K. (2017) The Highly Dynamic Nature of ERdj5 Is Key to Efficient Elimination of Aberrant Protein Oligomers through ER-Associated Degradation. *Structure*, 25(6), pp. 846-857.
17. Mierzwa, B.E., Chiaruttini, N., Redondo-Morata, L., Moser Von Filseck, J., König, J., Larios, J., Poser, I., Müller-Reichert, T., Scheuring, S., Roux, A., Gerlich, D.W. (2017) Dynamic subunit turnover in ESCRT-III assemblies is regulated by Vps4 to mediate membrane remodelling during cytokinesis. *Nature Cell Biology*, 19(7), pp. 787-798.
18. Mikheikin, A., Olsen, A., Leslie, K., Russell-Pavier, F., Yacoot, A., Picco, L., Payton, O., Toor, A., Chesney, A., Gimzewski, J.K., Mishra, B., Reed, J. (2017) DNA nanomapping using CRISPR-Cas9 as a programmable nanoparticle. *Nature Communications*, 8(1),1665.
19. Mohamed, M.S., Kobayashi, A., Taoka, A., Watanabe-Nakayama, T., Kikuchi, Y., Hazawa, M., Minamoto, T., Fukumori, Y., Kodera, N., Uchihashi, T., Ando, T., Wong, R.W. (2017) High-Speed Atomic Force Microscopy Reveals Loss of Nuclear Pore Resilience as a Dying Code in Colorectal Cancer Cells. *ACS Nano*, 11(6), pp. 5567-5578.
20. Pan, Y., Sun, Z., Maiti, A., Kanai, T., Matsuo, H., Li, M., Harris, R.S., Shlyakhtenko, L.S., Lyubchenko, Y.L. (2017) Nanoscale Characterization of Interaction of APOBEC3G with RNA. *Biochemistry*, 56(10), pp. 1473-1481.
21. Plochberger, B., Röhr, C., Preiner, J., Rankl, C., Brameshuber, M., Madl, J., Bittman, R., Ros, R., Sezgin, E., Eggeling, C., Hinterdorfer, P., Stangl, H., Schütz, G.J. (2017) HDL particles

incorporate into lipid bilayers—a combined AFM and single molecule fluorescence microscopy study. *Scientific Reports*, 7(1),15886.

22. Rahman, M., Day, B.S., Neff, D., Norton, M.L. (2017) Origami Arrays as Substrates for the Determination of Reaction Kinetics Using High-Speed Atomic Force Microscopy. *Langmuir*, 33(30), pp. 7389-7392.
23. Rangl, M., Rima, L., Klement, J., Miyagi, A., Keller, S., Scheuring, S. (2017) Real-time Visualization of Phospholipid Degradation by Outer Membrane Phospholipase A using High-Speed Atomic Force Microscopy. *Journal of Molecular Biology*, 429(7), pp. 977-986.
24. Rigato, A., Miyagi, A., Scheuring, S., Rico, F. (2017) High-frequency microrheology reveals cytoskeleton dynamics in living cells. *Nature Physics*, 13(8), pp. 771-775.
25. Ruan, Y., Miyagi, A., Wang, X., Chami, M., Boudker, O., Scheuring, S. (2017) Direct visualization of glutamate transporter elevator mechanism by high-speed AFM. *Proceedings of the National Academy of Sciences of the United States of America*, 114(7), pp. 1584-1588.
26. Satoh, T., Song, C., Zhu, T., Toshimori, T., Murata, K., Hayashi, Y., Kamikubo, H., Uchihashi, T., Kato, K. (2017) Visualisation of a flexible modular structure of the ER folding-sensor enzyme UGGT. *Scientific Reports*, 7(1),12142.
27. Shibata, M., Nishimasu, H., Kodera, N., Hirano, S., Ando, T., Uchihashi, T., Nureki, O. (2017) Real-space and real-time dynamics of CRISPR-Cas9 visualized by high-speed atomic force microscopy. *Nature Communications*, 8(1),1430.
28. Sumino, A., Uchihashi, T., Oiki, S. (2017) Oriented Reconstitution of the Full-Length KcsA Potassium Channel in a Lipid Bilayer for AFM Imaging. *J. Phy. Chem. Lett.*, 8, 785-793.
29. Terahara, N., Kodera, N., Uchihashi, T., Ando, T., Namba, K., Minamino, T. (2017) Na<sup>+</sup>-induced structural transition of MotPS for stator assembly of the Bacillus flagellar motor. *Science Advances*, 3(11), eaao4119.
30. Ushimaru, K., Mizuno, S., Honya, A., Abe, H., Tsuge, T. (2017) Real-Time Observation of Enzymatic Polyhydroxyalkanoate Polymerization Using High-Speed Scanning Atomic Force Microscopy. *ACS Omega*, 2(1), pp. 181-185.
31. Willner, E.M., Kamada, Y., Suzuki, Y., Emura, T., Hidaka, K., Dietz, H., Sugiyama, H., Endo, M. (2017) Single-Molecule Observation of the Photoregulated Conformational Dynamics of DNA Origami Nanoscissors. *Angewandte Chemie - International Edition*, 56(48), pp. 15324-15328.
32. Yang, Y., Tashiro, R., Suzuki, Y., Emura, T., Hidaka, K., Sugiyama, H., Endo, M. (2017) A Photoregulated DNA-Based Rotary System and Direct Observation of Its Rotational Movement. *Chemistry - A European Journal*, 23(16), pp. 3979-3985.
33. Zhang, Y., Tunuguntla, R.H., Choi, P.-O., Noy, A. (2017) Real-time dynamics of carbon nanotube porins in supported lipid membranes visualized by high-speed atomic force microscopy. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 372(1726),20160226.

34. Zhang, Y., Yoshida, A., Sakai, N., Uekusa, Y., Kumeta, M., Yoshimura, S.H. (2017) In vivo dynamics of the cortical actin network revealed by fast-scanning atomic force microscopy. *Microscopy*, 66(4), pp. 272-282.

#### **Review Articles**

35. Ando, T. (2017) Directly watching biomolecules in action by high-speed atomic force microscopy. *Biophysical Reviews*, 9(4), pp. 421-429.
36. Ando T. (2017) High-speed atomic force microscopy for observing protein molecules in dynamic action. *Proceedings of SPIE - The International Society for Optical Engineering*, 10328,103281R.
37. Dufrêne, Y.F., Ando, T., Garcia, R., Alsteens, D., Martinez-Martin, D., Engel, A., Gerber, C., Müller, D.J. (2017) Imaging modes of atomic force microscopy for application in molecular and cell biology. *Nature Nanotechnology*, 12(4), pp. 295-307.
38. Sakiyama, Y., Panatala, R., Lim, R.Y.H. (2017) Structural dynamics of the nuclear pore complex. *Seminars in Cell and Developmental Biology*, 68, pp. 27-33.

#### **2016**

1. Eeftens, J.M., Katan, A.J., Kschonsak, M., Hassler, M., de Wilde, L., Dief, E.M., Haering, C.H., Dekker, C. (2016) Condensin Smc2-Smc4 Dimers Are Flexible and Dynamic. *Cell Reports*, 14(8), pp. 1813-1818.
2. Godonoga, M., Lin, T.-Y., Oshima, A., Sumitomo, K., Tang, M.S.L., Cheung, Y.-W., Kinghorn, A.B., Dirkwager, R.M., Zhou, C., Kuzuya, A., Tanner, J.A., Heddle, J.G. (2016) A DNA aptamer recognising a malaria protein biomarker can function as part of a DNA origami assembly. *Scientific Reports*, 6, 21266.
3. Miyagi, A., Chipot, C., Rangl, M., Scheuring, S. (2016) High-speed atomic force microscopy shows that annexin V stabilizes membranes on the second timescale. *Nature Nanotechnology*, 11(9), pp. 783-790.
4. Munguira, I., Casuso, I., Takahashi, H., Rico, F., Miyagi, A., Chami, M., Scheuring, S. (2016) Glasslike Membrane Protein Diffusion in a Crowded Membrane. *ACS Nano*, 10(2), pp. 2584-2590.
5. Rangl, M., Miyagi, A., Kowal, J., Stahlberg, H., Nimigean, C.M., Scheuring, S. (2016) Real-time visualization of conformational changes within single MloK1 cyclic nucleotide-modulated channels. *Nature Communications*, 7,12789.
6. Rätz, M.H., Hidaka, K., Sturla, S.J., Sugiyama, H., Endo, M. (2016) Torsional Constraints of DNA Substrates Impact Cas9 Cleavage. *Journal of the American Chemical Society*, 138(42), pp. 13842-13845.

7. Ruan, Y., Rezelj, S., Bedina Zavec, A., Anderluh, G., Scheuring, S. (2016) Listeriolysin O Membrane Damaging Activity Involves Arc Formation and Lineaction – Implication for *Listeria monocytogenes* Escape from Phagocytic Vacuole. *PLoS Pathogens*, 12(4),e1005597.
8. Sakiyama, Y., Mazur, A., Kapinos, L.E., Lim, R.Y.H. (2016) Spatiotemporal dynamics of the nuclear pore complex transport barrier resolved by high-speed atomic force microscopy. *Nature Nanotechnology*, 11(8), pp. 719-723.
9. Sutter, M., Faulkner, M., Aussignargues, C., Paasch, B.C., Barrett, S., Kerfeld, C.A., Liu, L.-N. (2016) Visualization of Bacterial Microcompartment Facet Assembly Using High-Speed Atomic Force Microscopy. *Nano Letters*, 16(3), pp. 1590-1595.
10. Takahashi, H., Miyagi, A., Redondo-Morata, L., Scheuring, S. (2016) Temperature-Controlled High-Speed AFM: Real-Time Observation of Ripple Phase Transitions. *Small*, 12(44), pp. 6106-6113.
11. Watanabe-Nakayama, T., Itami, M., Kodera, N., Ando, T., Konno, H. (2016) High-speed atomic force microscopy reveals strongly polarized movement of clostridial collagenase along collagen fibrils. *Scientific Reports*, 6,28975.
12. Watanabe-Nakayama, T., Ono, K., Itami, M., Takahashi, R., Teplow, D.B., Yamada, M. (2016) High-speed atomic force microscopy reveals structural dynamics of amyloid  $\beta$ 1-42 aggregates. *Proceedings of the National Academy of Sciences of the United States of America*, 113(21), pp. 5835-5840.
13. Yamagata, Y., Emura, T., Hidaka, K., Sugiyama, H., Endo, M. (2016) Triple Helix Formation in a Topologically Controlled DNA Nanosystem. *Chemistry - A European Journal*, 22(16), pp. 5494-5498.
14. Yamamoto, D., Ando, T. (2016) Chaperonin GroEL–GroES Functions as both Alternating and Non-Alternating Engines. *Journal of Molecular Biology*, 428(15), pp. 3090-3101.
15. Yamamoto, H., Fujioka, Y., Suzuki, S. W., Noshiro, D., Suzuki, H., Kondo-Kakuta, C., Kimura, Y., Hirano, H., Ando, T., Noda, N. N., Ohsumi, Y. (2016) The Intrinsically Disordered Protein Atg13 Mediates Supramolecular Assembly of Autophagy Initiation Complexes, *Dev. Cell* 38:86-99.

### **Review Articles**

16. Hodel, A.W., Leung, C., Dudkina, N.V., Saibil, H.R., Hoogenboom, B.W. (2016) Atomic force microscopy of membrane pore formation by cholesterol dependent cytolysins. *Current Opinion in Structural Biology*, 39, pp. 8-15.
17. Lukyanova, N., Hoogenboom, B.W., Saibil, H.R. (2016) The membrane attack complex, perforin and cholesteroldependent cytolysin superfamily of pore-forming proteins. *Journal of Cell Science*, 129(11), pp. 2125-2133.

18. Lyubchenko, Y.L., Shlyakhtenko, L.S. (2016) Imaging of DNA and protein–DNA complexes with atomic force microscopy. *Critical Reviews in Eukaryotic Gene Expression*, 26(1), pp. 63-96.

## 2015

1. Chiaruttini, N., Redondo-Morata, L., Colom, A., Humbert, F., Lenz, M., Scheuring, S., Roux, A. (2015) Relaxation of Loaded ESCRT-III Spiral Springs Drives Membrane Deformation. *Cell*, 163(4), pp. 866-879.
2. Davies, T., Kodera, N., Kaminski Schierle, G.S., Rees, E., Erdelyi, M., Kaminski, C.F., Ando, T., Mishima, M. (2015) CYK4 Promotes Antiparallel Microtubule Bundling by Optimizing MKLP1 Neck Conformation. *PLoS Biology*, 13(4), e1002121.
3. Endo, M., Takeuchi, Y., Suzuki, Y., Emura, T., Hidaka, K., Wang, F., Willner, I., Sugiyama, H. (2015) Single-Molecule Visualization of the Activity of a Zn<sup>2+</sup>-Dependent DNAzyme. *Angewandte Chemie - International Edition*, 54(36), pp. 10550-10554.
4. Endo, M., Xing, X., Zhou, X., Emura, T., Hidaka, K., Tuesuwan, B., Sugiyama, H. (2015) Single-Molecule Manipulation of the Duplex Formation and Dissociation at the G-Quadruplex/i-Motif Site in the DNA Nanostructure. *ACS Nano*, 9(10), pp. 9922-9929.
5. Horner, A., Zocher, F., Preiner, J., Ollinger, N., Siligan, C., Akimov, S.A., Pohl, P. (2015) The mobility of single-file water molecules is governed by the number of H-bonds they may form with channel-lining residues. *Science Advances*, 1(2), e1400083.
6. Imamura, M., Uchihashi, T., Ando, T., Leifert, A., Simon, U., Malay, A.D., Heddle, J.G. (2015) Probing structural dynamics of an artificial protein cage using high-speed atomic force microscopy. *Nano Letters*, 15(2), pp. 1331-1335.
7. Jiang, Z., Zhang, S., Yang, C., Kjems, J., Huang, Y., Besenbacher, F., Dong, M. (2015) Serum-induced degradation of 3D DNA box origami observed with high-speed atomic force microscopy. *Nano Research*, 8(7), pp. 2170-2178.
8. Katan, A.J., Vlijm, R., Lusser, A., Dekker, C. (2015) Dynamics of nucleosomal structures measured by high-speed atomic force microscopy. *Small*, 11(8), pp. 976-984.
9. Kodera, N., Uchida, K., Ando, T., Aizawa, S.-I. (2015) Two-ball structure of the flagellar hook-length control protein flik as revealed by high-speed atomic force microscopy. *Journal of Molecular Biology*, 427(2), pp. 406-414
10. Lee, A.J., Szymonik, M., Hobbs, J.K., Wälti, C. (2015) Tuning the translational freedom of DNA for high speed AFM. *Nano Research*, 8(6), pp. 1811-1821.
11. Matsumoto, R., Uemura, T., Xu, Z., Yamaguchi, I., Ikoma, T., Tanaka, J. (2015) Rapid oriented fibril formation of fish scale collagen facilitates early osteoblastic differentiation of human mesenchymal stem cells. *Journal of Biomedical Materials Research - Part A*, 103(8), pp. 2531-2539.

12. Ngo, K.X., Kodera, N., Katayama, E., Ando, T., Uyeda, T.Q. (2015) Cofilin-induced unidirectional cooperative conformational changes in actin filaments revealed by high-speed atomic force microscopy. *eLife*, 2015(4),e04806, pp. 1-22.
13. Nievergelt, A.P., Erickson, B.W., Hosseini, N., Adams, J.D., Fantner, G.E. (2015) Studying biological membranes with extended range high-speed atomic force microscopy. *Scientific Reports*, 5,11987.
14. Oestreicher, Z., Taoka, A., Fukumori, Y. (2015) A comparison of the surface nanostructure from two different types of gram-negative cells: *Escherichia coli* and *Rhodobacter sphaeroides*. *Micron*, 72, pp. 8-14.
15. Preiner, J., Horner, A., Karner, A., Ollinger, N., Siligan, C., Pohl, P., Hinterdorfer, P. (2015) High-speed AFM images of thermal motion provide stiffness map of interfacial membrane protein moieties. *Nano Letters*, 15(1), pp. 759-763.
16. Shibata, M., Uchihashi, T., Ando T., Yasuda, R. (2015) Long-tip high-speed atomic force microscopy for nanometer-scale imaging in live cells. *Scientific Reports*, 5, 8724.
17. Sriwimol, W., Aroonkesorn, A., Sakdee, S., Kanchanawarin, C., Uchihashi, T., Ando, T., Angsuthanasombat, C. (2015) Potential prepore trimer formation by the *Bacillus thuringiensis* mosquito-specific toxin: Molecular insights into a critical prerequisite of membrane-bound monomers. *Journal of Biological Chemistry*, 290(34), pp. 20793-20803.
18. Stamov, D.R., Stock, E., Franz, C.M., Jähnke, T., Haschke, H. (2015) Imaging collagen type I fibrillogenesis with high spatiotemporal resolution. *Ultramicroscopy*, 149, pp. 86-94.
19. Suzuki, Y., Endo, M., Sugiyama, H. (2015) Lipid-bilayer-assisted two-dimensional self-assembly of DNA origami nanostructures. *Nature Communications*, 6,9052.
20. Suzuki, T., Kawaguchi, A., Ainai, A., Tamura, S.-I., Ito, R., Multihartina, P., Setiawaty, V., Pangesti, K.N.A., Odagiri, T., Tashiro, M., Hasegawa, H., (2015) Relationship of the quaternary structure of human secretory IgA to neutralization of influenza virus. *Proceedings of the National Academy of Sciences of the United States of America*, 112(25), pp. 7809-7814.
21. Takeda, K., Uchihashi, T., Watanabe, H., Ishida, T., Igarashi, K., Nakamura, N., Ohno, H. (2015) Real-time dynamic adsorption processes of cytochrome c on an electrode observed through electrochemical high-speed atomic force microscopy. *PLoS ONE*, 10(2), e0116685.
22. Yang, Y., Goetzfried, M.A., Hidaka, K., You, M., Tan, W., Sugiyama, H., Endo, M. (2015) Direct Visualization of Walking Motions of Photocontrolled Nanomachine on the DNA Nanostructure. *Nano Letters*, 15(10), pp. 6672-6676.
23. Yilmaz, N., Kobayashi, T. (2015) Visualization of Lipid Membrane Reorganization Induced by a Pore-Forming Toxin Using High-Speed Atomic Force Microscopy. *ACS Nano*, 9(8), pp. 7960-7967.

24. Yoshida, A., Sakai, N., Uekusa, Y., Deguchi, K., Gilmore, J.L., Kumeta, M., Ito, S., Takeyasu, K. (2015) Probing in vivo dynamics of mitochondria and cortical actin networks using high-speed atomic force/fluorescence microscopy. *Genes to Cells*, 20(2), pp. 85-94.

#### **Review Articles**

25. Henderson, R.M. (2015) Structural dynamics of single molecules studied with high-speed atomic force microscopy. *Expert Opinion on Drug Discovery*, 10(3), pp. 221-229.
26. Uchihashi, T., Kodera, N., Ando, T. (2015) High-speed atomic force microscopy. *NanoScience and Technology*, 97, pp. 481-581.

#### **Method & Protocol Articles**

27. Gilmore, J.L., Yoshida, A., Takahashi, H., Deguchi, K., Kobori, T., Louvet, E., Kumeta, M., Yoshimura, S.H., Takeyasu, K. (2015) Analyses of nuclear proteins and nucleic acid structures using atomic force microscopy. *Methods in Molecular Biology*, 1262, pp. 119-153.
28. Lyubchenko, Y.L., Shlyakhtenko, L.S. (2015) Chromatin imaging with time-lapse atomic force microscopy. *Methods in Molecular Biology*, 1288, pp. 27-42.
29. Shibata, T., Suzuki, Y., Sugiyama, H., Endo, M., Saito, H. (2015) Folding RNA–protein complex into designed nanostructures. *Methods in Molecular Biology*, 1316, pp. 169-179.
30. Suzuki, Y., Endo, M., Sugiyama, H. (2015) Studying RNAP-promoter interactions using atomic force microscopy. *Methods*, 86, pp. 4-9.

#### **2014**

1. Braunsmann, C., Seifert, J., Rheinlaender, J., Schäffer, T.E. (2014) High-speed force mapping on living cells with a small cantilever atomic force microscope. *Review of Scientific Instruments*, 85(7),073703
2. Heath, G.R., Roth, J., Connell, S.D., Evans, S.D. (2014) Diffusion in low-dimensional lipid membranes. *Nano Letters*, 14(10), pp. 5984-5988.
3. Igarashi, K., Uchihashi, T., Uchiyama, T., Sugimoto, H., Wada, M., Suzuki, K., Sakuda, S., Ando, T., Watanabe, T., Samejima, M. (2014) Two-way traffic of glycoside hydrolase family 18 processive chitinases on crystalline chitin. *Nature Communications*, 5,3975.
4. Ishino, S., Yamagami, T., Kitamura, M., Kodera, N., Mori, T., Sugiyama, S., Ando, T., Goda, N., Tenno, T., Hiroaki, H., Ishino, Y. (2014) Multiple interactions of the intrinsically disordered region between the helicase and nuclease domains of the archaeal Hef protein. *Journal of Biological Chemistry*, 289(31), pp. 21627-21639.
5. Kang, S.-J., Todokoro, Y., Yumen, I., Shen, B., Iwasaki, I., Suzuki, T., Miyagi, A., Yoshida, M., Fujiwara, T., Akutsu, H. (2014) Active-site structure of the thermophilic Foc-subunit ring in membranes elucidated by solid-state NMR. *Biophysical Journal*, 106(2), pp. 390-398.

6. Kowal, J., Chami, M., Baumgartner, P., Arbeit, M., Chiu, P.-L., Rangl, M., Scheuring, S., Schröder, G.F., Nimigean, C.M., Stahlberg, H. (2014) Ligand-induced structural changes in the cyclic nucleotide-modulated potassium channel MloK1. *Nature Communications*, 5,3106.
7. Leung, C., Dudkina, N.V., Lukoyanova, N., Hodel, A.W., Farabella, I., Pandurangan, A.P., Jahan, N., Pires Damaso, M., Osmanović, D., Reboul, C.F., Dunstone, M.A., Andrew, P.W., Lonnen, R., Topf, M., Saibil, H.R., Hoogenboom, B.W. (2014) Stepwise visualization of membrane pore formation by suliyisin, a bacterial cholesterol-dependent cytolysin. *eLife*, 3, pp. e04247.
8. Nakamura, A., Watanabe, H., Ishida, T., Uchihashi, T., Wada, M., Ando, T., Igarashi, K., Samejima, M. (2014) Trade-off between processivity and hydrolytic velocity of cellobiohydrolases at the surface of crystalline cellulose. *Journal of the American Chemical Society*, 136(12), pp. 4584-4592.
9. Osada, E., Suzuki, Y., Hidaka, K., Ohno, H., Sugiyama, H., Endo, M., Saito, H. (2014) Engineering RNA-Protein Complexes with Different Shapes for Imaging and Therapeutic Applications. *ACS Nano*, 8(8), pp. 8130-8140.
10. Preiner, J., Kodera, N., Tang, J., Ebner, A., Brameshuber, M., Blaas, D., Gelbmann, N., Gruber, H., Ando, T., Hinterdorfer, P. (2014) IgGs are made for walking on bacterial and viral surfaces. *Nature Communications*, 5,4394.
11. Rajendran, A., Endo, M., Hidaka, K., Sugiyama, H. (2014) Direct and single-molecule visualization of the solution-state structures of G-hairpin and G-triplex intermediates. *Angewandte Chemie - International Edition*, 53(16), pp. 4107-4112.
12. Rajendran, A., Endo, M., Hidaka, K., Tran, P.L.T., Teulade-Fichou, M.-P., Mergny, J.-L., Sugiyama, H. (2014) G-quadruplex-binding ligand-induced DNA synapsis inside a DNA origami frame. *RSC Advances*, 4(12), pp. 6346-6355.
13. Sanchez, H., Reuter, M., Yokokawa, M., Takeyasu, K., Wyman, C. (2014) Taking it one step at a time in homologous recombination repair. *DNA Repair*, 20, pp. 110-118.
14. Shibafuji, Y., Nakamura, A., Uchihashi, T., Sugimoto, N., Fukuda, S., Watanabe, H., Samejima, M., Ando, T., Noji, H., Koivula, A., Igarashi, K., Iino, R. (2014) Single-molecule imaging analysis of elementary reaction steps of trichoderma reesei cellobiohydrolase i (Cel7A) hydrolyzing crystalline cellulose I<sub>α</sub> and III<sub>i</sub>. *Journal of Biological Chemistry*, 289(20), pp. 14056-14065.
15. Suzuki, Y., Endo, M., Katsuda, Y., Ou, K., Hidaka, K., Sugiyama, H. (2014) DNA origami based visualization system for studying site-specific recombination events. *Journal of the American Chemical Society*, 136(1), pp. 211-218.
16. Suzuki, Y., Endo, M., Yang, Y., Sugiyama, H. (2014) Dynamic assembly/disassembly processes of photoresponsive DNA origami nanostructures directly visualized on a lipid membrane surface. *Journal of the American Chemical Society*, 136(5), pp. 1714-1717.
17. Takenaka, T., Endo, M., Suzuki, Y., Yang, Y., Emura, T., Hidaka, K., Kato, T., Miyata, T., Namba, K., Sugiyama, H. (2014) Photoresponsive DNA nanocapsule having an open/close system for

capture and release of nanomaterials. *Chemistry - A European Journal*, 20(46), pp. 14951-14954.

18. Yang, Y., Endo, M., Suzuki, Y., Hidaka, K., Sugiyama, H. (2014) Direct observation of the dual-switching behaviors corresponding to the state transition in a DNA nanoframe. *Chemical Communications*, 50(32), pp. 4211-4213.

#### **Review Articles**

19. Ando, T. High-speed AFM imaging (2014) *Current Opinion in Structural Biology*, 28(1), pp. 63-68.
20. Rajendran, A., Endo, M., Sugiyama, H. (2014) State-of-the-art high-speed atomic force microscopy for investigation of single-molecular dynamics of proteins. *Chemical Reviews*, 114(2), pp. 1493-1520.
21. Ando, T., Uchihashi, T., Scheuring, S. (2014) Filming biomolecular processes by high-speed atomic force microscopy. *Chemical Reviews*, 114(6), pp. 3120-3188.
22. Endo, M., Sugiyama, H. (2014) Single-molecule imaging of dynamic motions of biomolecules in DNA origami nanostructures using high-speed atomic force microscopy. *Accounts of Chemical Research*, 47(6), pp. 1645-1653.
23. Kodera, N., Ando, T. (2014) The path to visualization of walking myosin V by high-speed atomic force microscopy. *Biophysical Reviews*, 6(3-4), pp. 237-260.
24. Lyubchenko, Y.L. (2014) Nanoscale nucleosome dynamics assessed with time-lapse AFM. *Biophysical Reviews*, 6(2), pp. 181-190.
25. Eghiaian, F., Rico, F., Colom, A., Casuso, I., Scheuring, S. (2014) High-speed atomic force microscopy: Imaging and force spectroscopy. *FEBS Letters*, 588(19), pp. 3631-3638.

#### **2013**

1. Colom, A., Casuso, I., Rico, F., Scheuring, S. (2013) A hybrid high-speed atomic force-optical microscope for visualizing single membrane proteins on eukaryotic cells. *Nature Communications*, 4,2155.
2. Fukuda, S., Uchihashi, T., Iino, R., Okazaki, Y., Yoshida, M., Igarashi, K., Ando, T. (2013) High-speed atomic force microscope combined with single-molecule fluorescence microscope. *Review of Scientific Instruments*, 84(7),073706.
3. Noi, K., Yamamoto, D., Nishikori, S., Arita-Morioka, K.-I., Kato, T., Ando, T., Ogura, T. (2013) High-speed atomic force microscopic observation of ATP-dependent rotation of the AAA+ chaperone p97. *Structure*, 21(11), pp. 1992-2002.
4. Li, J., Deng, Z., Chen, D., Ao, Z., Sun, Q., Feng, J., Yin, B., Han, L., Han, D. (2013) High-speed AFM for scanning the architecture of living cells. *Nanoscale*, 5(18), pp. 8355-8358.

5. Rico, F., Gonzalez, L., Casuso, I., Puig-Vidal, M., Scheuring, S. (2013) High-speed force spectroscopy unfolds titin at the velocity of molecular dynamics simulations. *Science*, 342(6159), pp. 741-743.
6. Shlyakhtenko, L.S., Lushnikov, A.Y., Miyagi, A., Li, M., Harris, R.S., Lyubchenko, Y.L. (2013) Atomic force microscopy studies of APOBEC3G oligomerization and dynamics. *Journal of Structural Biology*, 184(2), pp. 217-225.
7. Suzuki, Y., Goetze, T.A., Stroebel, D., Balasuriya, D., Yoshimura, S.H., Henderson, R.M., Paoletti, P., Takeyasu, K., Edwardson, J.M. (2013) Visualization of structural changes accompanying activation of N-methyl-D-aspartate (NMDA) receptors using fast-scan atomic force microscopy imaging. *Journal of Biological Chemistry*, 288(2), pp. 778-784.
8. Suzuki, Y., Sakai, N., Yoshida, A., Uekusa, Y., Yagi, A., Imaoka, Y., Ito, S., Karaki, K., Takeyasu, K. (2013) High-speed atomic force microscopy combined with inverted optical microscopy for studying cellular events. *Scientific Reports*, 3,2131.
9. Watanabe, H., Uchihashi, T., Kobashi, T., Shibata, M., Nishiyama, J., Yasuda, R., Ando, T. (2013) Wide-area scanner for high-speed atomic force microscopy. *Review of Scientific Instruments*, 84(5),053702.
10. Yamashita, H., Inoue, K., Shibata, M., Uchihashi, T., Sasaki, J., Kandori, H., Ando, T. (2013) *Journal of Structural Biology*, 184(1), pp. 2-11.
11. Yilmaz, N., Yamada, T., Greimel, P., Uchihashi, T., Ando, T., Kobayashi, T. (2013) Real-time visualization of assembling of a sphingomyelin-specific toxin on planar lipid membranes. *Biophysical Journal*, 105(6), pp. 1397-1405.

#### **Review Articles**

12. Ando, T. Molecular machines directly observed by high-speed atomic force microscopy. *FEBS Letters*, 587(8), pp. 997-1007.
13. Ando, T. (2013) High-speed atomic force microscopy. *Journal of Electron Microscopy*, 62(1), pp. 81-93.
14. Ando, T., Uchihashi, T., Kodera, N. (2013) High-speed AFM and applications to biomolecular systems. *Annual Review of Biophysics*, 42(1), pp. 393-414.
15. Brown, B.P., Picco, L., Miles, M.J., Faul, C.F.J. (2013) Opportunities in high-speed atomic force microscopy. *Small*, 9(19), pp. 3201-3211.
16. Iino, R., Noji, H. (2013) Intersubunit coordination and cooperativity in ring-shaped NTPases. *Current Opinion in Structural Biology*, 23(2), pp. 229-234.

#### **2012**

1. Ando, T., Uchihashi, T., Kodera, N. (2012) High-speed atomic force microscopy. *Japanese Journal of Applied Physics*, 51(8 PART 4),08KA02.

2. Casuso, I., Khao, J., Chami, M., Paul-Gilloteaux, P., Husain, M., Duneau, J.-P., Stahlberg, H., Sturgis, J.N., Scheuring, S. (2012) Characterization of the motion of membrane proteins using high-speed atomic force microscopy. *Nature Nanotechnology*, 7(8), pp. 525-529.
3. Colom, A., Casuso, I., Boudier, T., Scheuring, S. (2012) High-Speed Atomic Force Microscopy: Cooperative Adhesion and Dynamic Equilibrium of Junctional Microdomain Membrane Proteins. *Journal of Molecular Biology*, 423(2), pp. 249-256.
4. Endo, M., Tatsumi, K., Terushima, K., Katsuda, Y., Harada, Y., Sugiyama, H. (2012) Direct visualization of the movement of a single T7 RNA polymerase and transcription on a DNA nanostructure. *Angewandte Chemie - International Edition*, 51(35), pp. 8778-8782.
5. Endo, M., Yang, Y., Suzuki, Y., Hidaka, K., Sugiyama, H. (2012) Single-molecule visualization of the hybridization and dissociation of photoresponsive oligonucleotides and their reversible switching behavior in a DNA nanostructure. *Angewandte Chemie - International Edition*, 51(42), pp. 10518-10522.
6. Husain, M., Boudier, T., Paul-Gilloteaux, P., Casuso, I., Scheuring, S. (2012) Software for drift compensation, particle tracking and particle analysis of high-speed atomic force microscopy image series. *Journal of Molecular Recognition*, 25(5), pp. 292-298.
7. Igarashi, K., Uchihashi, T., Koivula, A., Wada, M., Kimura, S., Penttilä, M., Ando, T., Samejima, M. (2012) Visualization of cellobiohydrolase i from *trichoderma reesei* moving on crystalline cellulose using high-speed atomic force microscopy. *Methods in Enzymology*, 510, pp. 169-182.
8. Iijima, M., Somiya, M., Yoshimoto, N., Niimi, T., Kuroda, S. (2012) Nano-visualization of oriented-immobilized IgGs on immunosensors by high-speed atomic force microscopy. *Scientific Reports*, 2,790.
9. Mohri, K., Nishikawa, M., Takahashi, N., Shiomi, T., Matsuoka, N., Ogawa, K., Endo, M., Hidaka, K., Sugiyama, H., Takahashi, Y., Takakura, Y. (2012) Design and development of nanosized DNA assemblies in polypod-like structures as efficient vehicles for immunostimulatory cpg motifs to immune cells. *ACS Nano*, 6(7), pp. 5931-5940.
10. Mori, T., Hirose, A., Hagiwara, T., Ohtsuka, M., Kakuta, Y., Kimata, K., Okahata, Y. (2012) Single-molecular enzymatic elongation of hyaluronan polymers visualized by high-speed atomic force microscopy. *Journal of the American Chemical Society*, 134(50), pp. 20254-20257.
11. Nojima, T., Konno, H., Kodera, N., Seio, K., Taguchi, H., Yoshida, M. (2012) Nano-Scale Alignment of Proteins on a Flexible DNA Backbone. *PLoS ONE*, 7(12),e52534.
12. Shlyakhtenko, L.S., Lushnikov, A.Y., Miyagi, A., Li, M., Harris, R.S., Lyubchenko, Y.L. (2012) Nanoscale structure and dynamics of ABOBEC3G complexes with single-stranded DNA. *Biochemistry*, 51(32), pp. 6432-6440.

13. Suzuki, Y., Shin, M., Yoshida, A., Yoshimura, S.H., Takeyasu, K. (2012) Fast microscopical dissection of action scenes played by Escherichia coli RNA polymerase. *FEBS Letters*, 586(19), pp. 3187-3192.
14. Yamashita, H., Taoka, A., Uchihashi, T., Asano, T., Ando, T., Fukumori, Y. (2012) Single-molecule imaging on living bacterial cell surface by high-speed AFM. *Journal of Molecular Biology*, 422(2), pp. 300-309.

#### **Review Articles**

15. Ando, T. (2012) High-speed atomic force microscopy coming of age. *Nanotechnology*, 23(6), 062001.
16. Iino, R., Noji, H. (2012) Rotary catalysis of the stator ring of F1-ATPase. *Biochimica et Biophysica Acta – Bioenergetics*, 1817(10), pp. 1732-1739.
17. Rajendran, A., Endo, M., Sugiyama, H. (2012) Structural and functional analysis of proteins by high-speed atomic force microscopy. *Advances in Protein Chemistry and Structural Biology*, 87, pp. 5-55.

#### **Method & Protocol Articles**

18. Ando, T., Kodera, N. (2012) Visualization of mobility by atomic force microscopy. *Methods in Molecular Biology*, 896, pp. 57-69.
19. Uchihashi, T., Kodera, N., Ando, T. (2012) Guide to video recording of structure dynamics and dynamic processes of proteins by high-speed atomic force microscopy. *Nature Protocols*, 7(6), pp. 1193-1206.

#### **2011**

1. Endo, M., Hidaka, K., Sugiyama, H. (2011) Direct AFM observation of an opening event of a DNA cuboid constructed via a prism structure. *Organic and Biomolecular Chemistry*, 9(7), pp. 2075-2077.
2. Laisne, A., Ewald, M., Ando, T., Lesniewska, E., Pompon, D. (2011) Self-assembly properties and dynamics of synthetic proteo-nucleic building blocks in solution and on surfaces. *Bioconjugate Chemistry*, 22(9), pp. 1824-1834.
3. Igarashi, K., Uchihashi, T., Koivula, A., Wada, M., Kimura, S., Okamoto, T., Penttilä, M., Ando, T., Samejima, M. (2011) Traffic jams reduce hydrolytic efficiency of cellulase on cellulose surface. *Science*, 333(6047), pp. 1279-1282.
4. Lyubchenko, Y.L. (2011) Preparation of DNA and nucleoprotein samples for AFM imaging. *Micron*, 42(2), pp. 196-206.
5. Miyagi, A., Ando, T., Lyubchenko, Y.L. (2011) Dynamics of nucleosomes assessed with time-lapse high-speed atomic force microscopy. *Biochemistry*, 50(37), pp. 7901-7908.

6. Sanchez, H., Suzuki, Y., Yokokawa, M., Takeyasu, K., Wyman, C. (2011) Protein-DNA interactions in high speed AFM: Single molecule diffusion analysis of human RAD54. *Integrative Biology*, 3(11), pp. 1127-1134.
7. Shibata, M., Uchihashi, T., Yamashita, H., Kandori, H., Ando, T. (2011) Structural changes in bacteriorhodopsin in response to alternate illumination observed by high-speed atomic force microscopy. *Angewandte Chemie - International Edition*, 50(19), pp. 4410-4413.
8. Suzuki, Y., Gilmore, J.L., Yoshimura, S.H., Henderson, R.M., Lyubchenko, Y.L., Takeyasu, K. (2011) Visual analysis of concerted cleavage by type IIF restriction enzyme SfiI in subsecond time region. *Biophysical Journal*, 101(12), pp. 2992-2998.
9. Uchihashi, T., Iino, R., Ando, T., Noji, H. (2011) High-speed atomic force microscopy reveals rotary catalysis of rotorless F<sub>1</sub>-ATPase. *Science*, 333(6043), pp. 755-758.
10. Yamamoto, S.-I., Okada, T., Uraoka, Y., Yamashita, I., Hasegawa, S. (2011) Static and dynamic observation of supermolecular protein, ferritin, using high-speed atomic force microscope. *Journal of Applied Physics*, 109(3), 034901.
11. Yokokawa, M., Takeyasu, K. (2011) Motion of the Ca<sup>2+</sup>-pump captured. *FEBS Journal*, 278(17), pp. 3025-3031.

#### **Review Articles**

12. Ando, T. (2011) Video imaging of biomolecular processes by high-speed AFM. *Proceedings of the IEEE International Conference on Micro Electro Mechanical Systems (MEMS)*, 5734361, pp. 57-62.
13. Casuso, I., Rico, F., Scheuring, S. (2011) High-speed atomic force microscopy: Structure and dynamics of single proteins. *Current Opinion in Chemical Biology*, 15(5), pp. 704-709.
14. Katan, A.J., Dekker, C. (2011) High-speed AFM reveals the dynamics of single biomolecules at the nanometer scale. *Cell*, 147(5), pp. 979-982.
15. Suzuki, Y., Yokokawa, M., Yoshimura, S.H., Takeyasu, K. (2011) Biological application of fast-scanning atomic force microscopy. *NanoScience and Technology*, 116, pp. 217-246.
16. Suzuki, Y., Yoshikawa, Y., Yoshimura, S.H., Yoshikawa, K., Takeyasu, K. (2011) Unraveling DNA dynamics using atomic force microscopy. *Wiley Interdisciplinary Reviews: Nanomedicine and Nanobiotechnology*, 3(6), pp. 574-588.

#### **Method & Protocol Articles**

17. Lyubchenko, Y.L., Shlyakhtenko, L.S., Ando, T. (2011) Imaging of nucleic acids with atomic force microscopy. *Methods*, 54(2), pp. 274-283.
18. Uchihashi, T., Ando, T. (2011) *Methods in Molecular Biology*, 736, pp. 285-300.

## 2010

1. Casuso, I., Sens, P., Rico, F., Scheuring, S. (2010) Experimental evidence for membrane-mediated protein-protein interaction. *Biophysical Journal*, 99(7), pp. L47-L49.
2. Fantner, G.E., Barbero, R.J., Gray, D.S., Belcher, A.M. (2010) Kinetics of antimicrobial peptide activity measured on individual bacterial cells using high-speed atomic force microscopy. *Nature Nanotechnology*, 5(4), pp. 280-285.
3. Kodera, N., Yamamoto, D., Ishikawa, R., Ando, T. (2010) Video imaging of walking myosin v by high-speed atomic force microscopy. *Nature*, 468(7320), pp. 72-76.
4. Milhiet, P.-E., Yamamoto, D., Berthoumieu, O., Dosset, P., le Grimellec, C., Verdier, J.-M., Marchal, S., Ando, T. (2010) *PLoS ONE*, 5(10),e13240.
5. Shibata, M., Yamashita, H., Uchihashi, T., Kandori, H., Ando, T. (2010) High-speed atomic force microscopy shows dynamic molecular processes in photoactivated bacteriorhodopsin. *Nature Nanotechnology*, 5(3), pp. 208-212.
6. Sugimoto, S., Yamanaka, K., Nishikori, S., Miyagi, A, Ando, T., Ogura, T. (2010) AAA+ chaperone ClpX regulates dynamics of prokaryotic cytoskeletal protein FtsZ. *Journal of Biological Chemistry*, 285(9), pp. 6648-6657.
7. Suzuki, Y., Higuchi, Y., Hizume, K., Yokokawa, M., Yoshimura, S.H), Yoshikawa, K., Takeyasu, K. (2010) Molecular dynamics of DNA and nucleosomes in solution studied by fast-scanning atomic force microscopy. *Ultramicroscopy*, 110(6), pp. 682-688.
8. Yokokawa, M., Carnally, S.M., Henderson, R.M., Takeyasu, K., Edwardson, J.M. (2010) Acid-sensing ion channel (ASIC) 1a undergoes a height transition in response to acidification. *FEBS Letters*, 584(14), pp. 3107-3110.

## Method & Protocol Articles

9. Yamamoto, D., Uchihashi, T., Kodera, N., Yamashita, H., Nishikori, S., Ogura, T., Shibata, M., Ando, T. (2010) High-Speed Atomic Force Microscopy Techniques for Observing Dynamic Biomolecular Processes. *Methods in Enzymology*, 475(C), pp. 541-564.

## 2009

1. Casuso, I., Kodera, N., Le Grimellec, C., Ando, T., Scheuring, S. (2009) Contact-mode high-resolution high-speed atomic force microscopy movies of the purple membrane. *Biophysical Journal*, 97(5), pp. 1354-1361.
2. Endo, M., Hidaka, K., Kato, T., Namba, K., Sugiyama, H. (2009) DNA prism structures constructed by folding of multiple rectangular arms. *Journal of the American Chemical Society*, 131(43), pp. 15570-15571.

3. Gilmore, J.L., Suzuki, Y., Tamulaitis, G., Siksnyš, V., Takeyasu, K., Lyubchenko, Y.L. (2009) Single-molecule dynamics of the DNA-EcoRII protein complexes revealed with high-speed atomic force microscopy. *Biochemistry*, 48(44), pp. 10492-10498.
4. Igarashi, K., Koivula, A., Wada, M., Kimura, S., Penttilä, M., Samejima, M. (2009) High speed atomic force microscopy visualizes processive movement of *Trichoderma reesei* cellobiohydrolase I on crystalline cellulose. *Journal of Biological Chemistry*, 284(52), pp. 36186-36190.
5. Pyne, A., Marks, W., Picco, L.M., Dunton, P.G., Ulcinas, A., Barbour, M.E., Jones, S.B., Gimzewski, J., Miles, M.J. (2009) High-speed atomic force microscopy of dental enamel dissolution in citric acid. *Archives of Histology and Cytology*, 72(4-5), pp. 209-215.
6. Yamamoto, D., Nagura, N., Omote, S., Taniguchi, M., Ando, T. (2009) Streptavidin 2D crystal substrates for visualizing biomolecular processes by atomic force microscopy. *Biophysical Journal*, 97(8), pp. 2358-2367.
7. Yamashita, H., Voitchovsky, K., Uchihashi, T., Contera, S.A., Ryan, J.F., Ando, T. (2009) Dynamics of bacteriorhodopsin 2D crystal observed by high-speed atomic force microscopy. *Journal of Structural Biology*, 167(2), pp. 153-158.

## 2008

1. Ando, T., Uchihashi, T., Fukuma, T. (2008) High-speed atomic force microscopy for nano-visualization of dynamic biomolecular processes. *Progress in Surface Science*, 83(7-9), pp. 337-437.
2. Miyagi, A., Tsunaka, Y., Uchihashi, T., Mayanagi, K., Hirose, S., Morikawa, K., Ando, T. (2008) Visualization of intrinsically disordered regions of proteins by high-speed atomic force microscopy. *ChemPhysChem*, 9(13), pp. 1859-1866.
3. Picco, L.M., Dunton, P.G., Ulcinas, A., Engledew, D.J., Hoshi, O., Ushiki, T., Miles, M.J. (2008) High-speed AFM of human chromosomes in liquid. *Nanotechnology*, 19(38),384018.
4. Sugasawa, H., Sugiyama, Y., Morii, T., Okada, T. (2008) Dynamic observation of 2686 bp DNA-BAL 31 nuclease interaction with single molecule level using high-speed atomic force microscopy. *Japanese Journal of Applied Physics*, 47(7 PART 3), pp. 6168-6172.
5. Yamamoto, D., Uchihashi, T., Kodera, N., Ando, T. (2008) Anisotropic diffusion of point defects in a two-dimensional crystal of streptavidin observed by high-speed atomic force microscopy. *Nanotechnology*, 19(38),384009.

## Review Articles

6. Ando, T., Uchihashi, T., Kodera, N., Yamamoto, D., Miyagi, A., Taniguchi, M., Yamashita, H. (2008) High-speed AFM and nano-visualization of biomolecular processes. *Pflügers Archiv European Journal of Physiology*, 456(1), pp. 211-225.

## 2007

1. Ando, T., Uchihashi, T., Kodera, N., Yamamoto, D., Taniguchi, M., Miyagi, A., Yamashita, H. (2007) High-speed atomic force microscopy for observing dynamic biomolecular processes. *Journal of Molecular Recognition*, 20(6), pp. 448-458.
2. Crampton, N., Yokokawa, M., Dryden, D.T.F., Edwardson, J.M., Rao, D.N., Takeyasu, K., Yoshimura, S.H., Henderson, R.M. (2007) Fast-scan atomic force microscopy reveals that the type III restriction enzyme EcoP15I is capable of DNA translocation and looping. *Proceedings of the National Academy of Sciences of the United States of America*, 104(31), pp. 12755-12760.
3. Kobayashi, M., Sumitomo, K., Torimitsu, K. (2007) Real-time imaging of DNA-streptavidin complex formation in solution using a high-speed atomic force microscope. *Ultramicroscopy*, 107(2-3), pp. 184-190.

## 2006

1. Yokokawa, M., Wada, C., Ando, T., Sakai, N., Yagi, A., Yoshimura, S.H., Takeyasu, K. (2006) Fast-scanning atomic force microscopy reveals the ATP/ADP-dependent conformational changes of GroEL. *EMBO Journal*, 25(19), pp. 4567-4576.

### Review Articles

2. Ando, T., Uchihashi, T., Kodera, N., Miyagi, A., Nakakita, R., Yamashita, H., Sakashita, M. (2006) High-speed atomic force microscopy for studying the dynamic behavior of protein molecules at work. *Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers*, 45(3 B), pp. 1897-1903.

## 2005

1. Humphris, A.D.L., Miles, M.J., Hobbs, J.K. (2005) A mechanical microscope: High-speed atomic force microscopy. *Applied Physics Letters*, 86(3), 034106, pp. 1-3.
2. Ando, T., Kodera, N., Uchihashi, T., Miyagi, A., Nakakita, R., Yamashita, H., Matada, K. (2005) High-speed atomic force microscopy for capturing dynamic behavior of protein molecules at work. *e-Journal of Surface Science and Nanotechnology*, 3, pp. 384-392.

## 2004

1. Ando, T., Kodera, N., Naito, Y., Kinoshita, T., Furuta, K., Toyoshima, Y.Y. (2004) A High-speed Atomic Force Microscope for Studying Biological Macromolecules in Action. *ChemPhysChem*, 4(11), pp. 1196-1202.

## 2003

## 2002

### Review Articles

1. Ando, T., Kodera, N., Maruyama, D., Takai, E., Saito, K., Toda, A. (2002) A high-speed atomic force microscope for studying biological macromolecules in action. *Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers*, 41(7 B), pp. 4851-4856.

## 2001

1. Ando, T., Kodera, N., Takai, E., Maruyama, D., Saito, K., Toda, A. (2001) A high-speed atomic force microscope for studying biological macromolecules. *Proceedings of the National Academy of Sciences of the United States of America*, 98(22), pp. 12468-12472.

## 2000

1. Viani, M. B., Pietrasanta, L. I., Thompson, J. B., Chand, A., Gebeshuber, I. C., Kindt, J. H., Richter, M., Hansma, H. G., Hansma, P. K. (2000) Probing protein–protein interactions in real time. *Nature Structural Biology*, 7, pp. 644–647.

## 1999

1. Van Noort, S.J.T., Van Der Werf, K.O., De Groot, B.G., Greve, J. (1999) High speed atomic force microscopy of biomolecules by image tracking. *Biophysical Journal*, 77(4), pp. 2295-2303.