Curriculum Vitae (CV)

Subscription field	Drug-discovery systems engineering	
Name	Masumi Taki, Ph. D.	
Date of birth	September 17, 1972 (Age: 52)	Sex Male
Nationality	Japan	
Address	The Graduate School of Informatics and Engineering, **The University of Electro-Communications (UEC)**, 1-5-1 Chofugaoka, Chofu, Tokyo, 182-8585, Japan	
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	Period	Matter
Education	1988.4-1991.3	Nanzan high school, Aichi prefecture
	1991.4-1994.3	Undergraduate student, Department of Chemistry, Faculty of Engineering, Gunma University *(Skipped one year during the course)*
	1994.4-1996.3	Graduate student, Department of Chemistry, (Master's course), Gunma University
	1996.4-1998.3	Ph.D. candidate, Department of Chemistry, (Doctor's course), Gunma University *(Skipped one year during the course*)
	2017	Teaching at ETH for ETH faculty members (Course 1; Fall semester), Educ. Dev. Tech., ETH Zürich, certificated.
Job appointments	1996.4-1998.3	Gunma Univ., JSPS research fellow, Fac. Engineer.
	1998.4-2000.3	Okayama Univ., JSPS research fellow, Fac. Engineer.
	2000.3-2002.3	Univ. Tokyo, JSPS research fellow, Fac. Engineer.
	2002.4	National Institute of Advanced Industrial Science and Technology (AIST), research fellow
	2002.5-2003.3	GenoFunction, Inc., research fellow
	2003.4-2003.7	AIST, research fellow
	2003.8-2011.11	Okayama Univ., assistant professor
	2007.8-2008.3	California institute of technology (CALTECH), Caltech visiting research associate, biology division
	2011.11 – current	**UEC** (Principal Investigator), associate professor, **full professor**
	2017.05 – 2017.09	ETH Zürich, Visiting Professor, Dept. Health Sciences and Technology (Professur Angew. Mechanobiologie)
	2018.09– current	Nihon University, Visiting Lecturer, College of Humanities and Sciences
Degree	31 March 1998	Ph. D. obtained at Gunma Univ., Dept. of Chemistry, Fac. of Engineering, Title: Regio- and Stereoselective Synthesis, Properties, and Applications of [60]Fullerene Bisadducts

Achievements

Authors	Title	Journal title	Vol, page	Year

I: Activity as a UEC professor:

I-1: Refereed international journals in UEC

Wavy line: In case that a student of my group was the first author.

1) **M. Taki***, M. Kuwahara, C. Li, N. Tomoda, N. Miyashita, T. Kan, J. Yang*, ARCaDia: single-round screening of a DNA-type targeted covalent binder possessing a latent warhead, Chem. Commun., 60, 14964 (2024), **back cover article**.
2) J. Yang*, Y. Tabuchi, R. Katsuki, **M. Taki***, bioTCIs: Middle-to-Macro Biomolecular Targeted Covalent Inhibitors Possessing Both Semi-Permanent Drug Action and Stringent Target Specificity as Potential Antibody Replacements, Int. J. Mol. Sci., 24, 3525 (2023); in Topical Collection "State-of-the-Art Molecular Immunology in Japan"
3) Y. Tabuchi, J. Yang*, **M. Taki***, Relative Nuclease Resistance of a DNA Aptamer Covalently Conjugated to a Target Protein, Int. J. Mol. Sci., 23, 7778 (2022); in Topical Collection "State-of-the-Art Macromolecules in Japan".
4) R. Katsuki, T. Numayama, Y. Tabuchi, J. Sharma, S. Naohito, A. Sandhu, **M. Taki***, Solvatochromic peptidic binder obtained via extended phage-display acts as a fluororeporter for fragment-based drug discovery (FBDD), Anal. Bioanal. Chem., 414, 4803 (2022).
5) Y. Tabuchi, T. Watanabe, R. Katsuki, Y. Ito, **M. Taki***, Direct screening of a target-specific covalent binder: stringent regulation of warhead reactivity in a match making environment, Chem. Commun., 57, 5378 (2021); **front cover article; hot article**.
6) Y. Tabuchi, J. Yang*, **M. Taki***, Inhibition of thrombin activity by a covalent-binding aptamer and reversal by the complementary strand antidote, Chem. Commun., 57, 2483 (2021), **front cover article**.
7) K. Mochizuki, L. Matsukura, Y. Ito, N. Miyashita*, **M. Taki***, Medium-firm drug-candidate library of cryptand-like structures on T7 phage: Design and selection of strong binder for Hsp90, Org. Biomol. Chem., 19, 146-150 (2021), **front cover article.**
8) W. Yimchuen, T. Kadonosono*, Y. Ota, S. Sato, M. Kitazawa, T. Shiozawa, T. Kuchimaru, **M. Taki**, Y. Ito, H. Nakamura, and S. Kizaka-Kondoh, Strategic design to create HER2-targeting proteins with target-binding peptides immobilized on a fibronectin type III domain scaffold, RSC Adv., 10, 15154-15162 (2020).
9) **M. Taki***, T. Yamashita, K. Yatabe, and V. Vogel*, Mechano-chromic protein–polymer hybrid hydrogel to visualize mechanical strain, Soft Matter, 15, 9388-9393 (2019), **back cover article**.
10) S. Hirasawa*, Y. Kitahara, Y. Okamatsu, T. Fujii, A. Nakayama, S. Ueno, C. Ijichi, F. Futaki, K. Nakata, and **M. Taki***, Facile and Efficient Chemoenzymatic Semi-Synthesis of Fc-Fusion Compounds for Half-Life Extension of Pharmaceutical Components, Bioconj. Chem., 30, 2323-2331 (2019), **front cover article**.
11) S. Uematsu, Y. Tabuchi, Y. Ito, and **M. Taki***, Combinatorially Screened Peptide as Targeted Covalent Binder: Alteration of Bait-Conjugated Peptide to Reactive Modifier, Bioconj. Chem., 29, 1866-1871 (2018).
12) K. Yatabe, M. Hisada, Y. Tabuchi, and **M. Taki***, Cysteine-reactive small photo-crosslinker possessing caged-fluorescence property: binding-site determination of a combinatorially-selected peptide by fluorescence imaging / tandem mass spectrometry, Int. J. Mol. Sci., 19, 3682 (2018).
13) Y. Tabuchi, **M. Taki***, Fluorescent 'keep-on' type pharmacophore obtained from dynamic combinatorial library of Schiff bases, Anal. Bioanal. Chem., 410, 6713-6717 (2018).
14) S. Uematsu, T. Midorikawa, Yuji Ito, and **M. Taki***, Selection of Turning-on Fluorogenic Probe as Protein-Specific Detector Obtained via the 10BASEd-T, AIP Conf. Proc., 1807, 020028 (2017).
15) K. Arimitsu*, H. Kimura, Y. Arai, K. Mochizuki, and **M. Taki***, 18F-Containing Positron Emission Tomography Probe Conjugation Methodology for Biologics as Specific Binders for Tumors, Curr. Top. Med. Chem., 16, 2703-2724 (2016).
16) **M. Taki***, H. Inoue, K. Mochizuki, J. Yang, Y. Ito, Selection of color-changing and intensity-increasing fluorogenic probe as protein-specific indicator obtained via the 10BASEd-T, Anal. Chem., 88, 1096-1099 (2016).
17) **M. Taki***, and H. Kuroiwa, Unexpectedly fast transfer of positron-emittable artificial substrate into N-terminus of peptide/protein mediated by wild-type L/F-tRNA-protein transferase, Amino Acids, 47,1279-1282 (2015).
18) K. Fukunaga, T. Hatanaka, Y. Ito, M. Minami, and **M. Taki***, Construction of a crown ether-like supramolecular library by conjugation of genetically-encoded peptide linkers displayed on bacteriophage T7, Chem. Commun., 50, 3921-3923 (2014), **front cover article.**
19) Y. Tokunaga, Y. Azetsu, K. Fukunaga, T. Hatanaka, Y. Ito and **M. Taki***, Pharmacophore generation from a drug-like core molecule surrounded by library peptide via the 10BASEd-T on bacteriophage T7, Molecules, 19, 2481-2496 (2014).
20) K. Fukunaga, T. Hatanaka, Y. Ito, and **M. Taki***, Gp10 based-thioetherification (10BASEd-T) on a displaying library peptide of bacteriophage T7, Molecular BioSystems, 9, 2988-2991 (2013).
21) J. Kawaguchi, K. Maejima, H. Kuroiwa, and **M. Taki***, Kinetic analysis of the leucyl/phenylalanyl-tRNA-protein transferase with acceptor peptides possessing different N-terminal penultimate residues, FEBS Open Bio, 3, 252-255 (2013).
22) K. Fukunaga and **M. Taki***, Practical Tips for Construction of Custom Peptide Libraries and Affinity Selection by Using Commercially Available Phage Display Cloning Systems, J. Nucl. Acids, Volume 2012, Article ID 295719 (2012).

I-2: Award

Award for Excellence in Interdisciplinary Research, The Japan Society of Mechanical Engineers (JSME), Robotics and Mechatronics Div. (2024).

I-3: Major affiliated societies

1. The Chemical Society of Japan (CSJ, including a related division of Bio-functional Chemistry)
2. Japan Society for Comprehensive Communication Science, **Board of Director.**
3. Japanese Peptide Society
4. Nucleic Acids Therapeutics Society of Japan

Achievements

Authors	Title	Journal title	Vol, page	Year

II: Refereed international journals in other institutes except UEC:

1) T. Hamamoto, M. Sisido, T. Ohtsuki, and **M. Taki***, Synthesis of cyclic peptide/ protein using the NEXT-A Reaction followed by cyclization, Chem. Commun., 47, 9116-9118 (2011).
2) K. Kitamura*, **M. Taki**, N. Tanaka, I. Yamashita, Fission yeast Ubr1 ubiquitin ligase influences the oxidative stress response via degradation of active Pap1 bZIP transcription factor in the nucleus, Mol. Microbiol., 80, 839-755 (2011).
3) **M. Taki***, Y. Yamazaki, Y. Suzuki, M. Sisido*, Introduction of a highly photodurable and common-laser excitable fluorescent amino acid into a peptide as a FRET acceptor for protease cleavage detection, Chem. Lett., 39, 818-819 (2010).
4) K. Ebisu, H. Tateno, H. Kuroiwa, K. Kawakami, M. Ikeuchi, J. Hirabayashi, M. Sisido, **M. Taki***, N-terminal specific point-immobilization of active proteins via the one-pot NEXT-A method, ChemBioChem, 10, 2460-2464 (2009).
5) **M. Taki***, H. Kuroiwa, M. Sisido*, Chemoenzymatic transfer of fluorescent non-natural amino acids to the N terminus of a protein/peptide, ChemBioChem, 9, 719-722 (2008).
6) **M. Taki***, and M. Sisido*, L/F-tRNA-protein transferase-mediated aminoacyl transfer of a nonnatural amino acid to the N-terminus of peptides and proteins and subsequent Functionalization by bioorthogonal reactions, Biopolymers: Peptide Science, 88, 263-271 (2007).
7) **M. Taki***, A. Kuno, S. Matoba, Y. Kobayashi, J. Futami, H. Murakami, H. Suga, K. Taira, T. Hasegawa, and M. Sisido*, Leucyl/Phenylalanyl-tRNA-protein transferase-mediated chemoenzymatic coupling of N-terminal Arg/Lys units in post-translationally processed proteins with nonnatural amino acids, ChemBioChem, 7, 1676-1679 (2006).
8) **M. Taki**, Y. Tokuda, T. Ohtsuki, and M. Sisido*, Design of carrier tRNAs and selection of four-base codons for efficient incorporation of various nonnatural amino acids into proteins in Spodoptera frugiperda 21 (Sf21) insect cell-Free translation system, J. Biosci. Bioeng., 102, 511-517 (2006).
9) **M. Taki**, J. Matsushita, M. Sisido*, Expanding the Genetic Code in a Mammalian Cell Line by the Introduction of Four-Base Codon/Anticodon Pairs, ChemBioChem, **7**, 425-428 (2006).
10) H. Hamada, N. Kameshima, A. Szymanska, K. Wegner, L. Lankiewicz, H. Shinohara, **M. Taki**, M. Sisido*, Position-specific incorporation of a highly photodurable and blue-laser excitable fluorescent amino acid into proteins for fluorescence sensing, Bioorganic & Medicinal Chemistry, **13**(10), 3379-3384 (2005).
11) **M. Taki,** Y. Kato, M. Miyagishi, Y. Takagi, K. Taira*, Small interfering RNA (siRNA) expression in cells based on an efficiently constructed dumbbell-shaped DNA, Angew. Chem. Int. Ed. Engl., **43**, 3160-3163 (2004).
12) **M. Taki,** M. Shiota, and K. Taira*, Enzymatic N- and C- terminal fluorescein labelling of a protein in vitro can support the native activity of the modified protein, Protein Eng., **17**, 119-126 (2004).
13) **M. Taki,** T. Hohsaka, H. Murakami, K. Taira, and M. Sisido*, Position-Specific Incorporation of a Fluorophore-Quencher Pair into a Single Streptavidin through Orthogonal Four-Base Codon/Anticodon Pairs, J. Am. Chem. Soc., **124**, 14586-14590 (2002).
14) **M. Taki**, and K. Taira*, Synthesis of novel Luminescent Substrates and their incorporation into a protein only at a terminal site via a transglutaminase-catalyzed enzymatic reaction, Chem. Lett., **33**, 234-235 (2004).
15) Y. Tanaka, Y. Kasai, S. Mochizuki, A. Wakisaka, E. H. Morita, C. Kojima, A. Toyozawa, Y. Kondo, **M. Taki**, Y. Takagi, A. Inoue, K. Yamasaki, K. Taira*, Nature of the Chemical Bond Formed with the Structural Metal Ion at the A9/G10.1 Motif Derived from Hammerhead Ribozymes, J. Am. Chem. Soc., **126**(3), 744-752 (2004).
16) Y. Ikeda, S. Kawahara, **M. Taki**, A. Kuno, T. Hasegawa, K. Taira*, Synthesis of a novel histidine analog and its efficient incorporation into a protein in vivo, Protein Engineering, **16**(9), 699-706 (2003).
17) **M. Taki,** S. Y. Sawata, and K. Taira*, Specific N-terminal biotinylation of a protein in vitro by a chemically modified $tRNA^{fmet}$ can support the native activity of the translated protein, J. Biosci. Bioeng., **92**, 149-153 (2001).
18) **M. Taki,** T. Hohsaka, H. Murakami, K. Taira, and M. Sisido*, A non-natural amino acid for efficient incorporation into proteins as a sensitive fluorescent probe, FEBS Lett., **507**, 35-38 (2001).
19) **M. Taki,** H. Murakami, M. Sisido*, A chiral Eu^{3+}-thienoyltrifluoroacetone complex on an avidin tetramer: Luminescence and CD studies on the supramolecular protein-metal chelate complex, Chem. Comm., 1199 (2000).
20) Y. Nakamura, **M. Taki**, A. Asami, S. Inokuma, K. Hiratani, K. Taguchi, M. Higuchi, J. Nishimura*, Langmuir Films of Amphiphilic [60]Fullerene Derivatives, Bulletin of the Chemical Society of Japan, **73**(7), 1615-1619 (2000).
21) Y. Nakamura, **M. Taki**, S. Tobita, H. Yokoi, K. Ishiguro, Y. Sawaki, J. Nishimura*, Photophysical properties of various regioisomers of [60]fullerene-o-quinodimethane bis-adducts, Journal of the Chemical Society, Perkin Transactions 2: Physical Organic Chemistry, (1), 127-130 (1999).
22) **M. Taki**, Y. Nakamura, H. Uehara, M. Sato, and J. Nishimura*, [60]Fullerene (A_1,D_1)-Bisadducts: CD Spectra of Enantiomers and Diastereospecific Synthesis, Enantiomer, **3**, 231-239 (1998).
23) **M. Taki**, S. Takigami, Y. Watanabe, Y. Nakamura, and J. Nishimura*, Synthesis of Polyesters Containing [60]Fullerene Moiety in the Main Chain by Mild Surface Condensation Method, Polym. J., **29**, 1020-1022 (1997).
24) **M. Taki**, S. Sugita, Y. Nakamura, E. Kasashima, E. Yashima, Y. Okamoto, and J. Nishimura*, Selective Functionalization on [60]Fullerene Governed by Tether Length, J. Am. Chem. Soc., **109**, 926-932 (1997).
25) Y. Nakamura, **M. Taki**, J. Nishimura*, Nomenclature of [60]fullerene derivatives by edge labeling, Chem. Lett., (8), 703-4 (1995).
26) M. Igarashi, M. Fukuda, **M. Taki**, T. Tago, T. Minowa, Y. Okada, J. Nishimura*, Photoreduction of water by the system of C60-platinum-methylviologen, Fullerene Science and Technology, 3(1), 37-43 (1995).

Achievements

Authors	Title	Journal title	Vol, page	Year

III: Selected oral presentations

Selected invited lectures:

1. **M. Taki**, BIOmolecular Targeted Covalent Inhibitor (bioTCI), Simposium Teknik Biomedis, Universitas Gadjah Mada (UGM), Indonesia, 2024/11/14.
2. **M. Taki**, Turn-on/keep-on fluctuated fluorescent molecules as targeted binders, the 58th Annual Meeting of the Biophysical Society of Japan, online, 2020/09/17.
3. **M. Taki**, Turn-on / keep-on fluorescent molecules as targeted binders, The third international workshop on symbiosis of biology and nanodevices (JSPS), Nara, 2019/06/26.
4. **M. Taki**, Creation of neobiological molecules via the 10BASEd-T for drug discovery, Polish Academy of Sciences, Warsaw (Poland), 2017/08/06.
5. **M. Taki**, Artificial Molecule Evolution via the 10BASEd-T, ETH Zurich Intergroup Seminar, 2016/09/26
6. **M. Taki**, Construction of peptide/protein-hybrid molecules via the NEXT-A and the 10BASEd-T reaction for PET imaging, The 9th ICME International Conference on Complex Medical Engineering (CME 2015), 2015/06/20
7. **M. Taki**, Artificial Molecule Evolution via the 10BASEd-T, IMS Asian International Symposium (Supramolecular Dynamics at the Interface of Chemistry and Biology), 2015/06/12
8. **M. Taki**, Keynote speech: Cancer detection and cure: antibody drugs and (hybrid) peptides as antibody substitutes, The second conference on interdisciplinary research in traditional medicine and modern medical bioscience, Nanjing, 2014/04/24
9. **M. Taki**, Drug-discovery systems engineering: construction of peptide/protein hybrid molecules via the NEXT-A and/or the 10BASEd-T reaction, BIT's 7th annual congress of industrial biotechnology (ibio)-2014, Dalian, 2014/04/27
10. **M. Taki**, Position-specific modification of nucleic acids/peptides/proteins toward pharmaceutical systems engineering, Nanjing Med. Univ., 2014/04/23.
11. Introduction of functional amino acids at the N-terminus of peptide/protein by the NEXT-A (N-Terminal EXtension with Transferase and ARS) reaction, Univ. Copenhagen, 2011/09.
12. **M. Taki**, Introduction of non-natural amino acids into the N-terminus of proteins via the NEXT-A reaction, Workshop at the 11th annual meeting of the Protein Science Society of Japan, Osaka, 2011/06/07.
13. **M. Taki**, Introduction of functional amino acids at the N-terminus of peptide/protein by the NEXT-A (N-Terminal EXtension with Transferase and ARS) reaction, the 4th HiPep-Okinawa Workshop, Naha, 2010/07/09.
14. **M. Taki**, An invited lecture-Regiospecific modifications of (bio)macromolecules, Polish Academy of Sciences, Warsaw (Poland), 2009/09/04.
15. **M. Taki**, N-terminal specific fluorescence and PET probe labeling at the N-terminus of protein by L/F-transferase, Seminar at Institure for Protein Research, Osaka university, Osaka, 2008/09/26.
16. **M. Taki**, Regiospecific modifications of (bio)macromolecules, 40th summer school of the Japanese Peptide Society, Otaru, 2007/08/07.
17. **M. Taki**, J. Matsushita, M. Sisido, Expanding the genetic code by the introduction of four-base codon/anticodon pairs, the 11th annual meeting of the Protein Science Society of Japan, Sendai, 2007/05/24.

Selected international symposiums (spoken in English):

1. **M. Taki**, Design, Selection, and Engineering of Targeted Hybrid-Middle Molecules via 10BASEd-T / NEXT-A Reactions, PACIFICHEM2021, O-16 (Section #370), online, 2021/12/20.
2. **M. Taki**, Chemoenzymatic synthesis of biologics-fused hybrid molecules via NEXT-A reaction, International Conference of 56th Japanese Peptide Symposium (56JPS), Tokyo, 2019/10/15.
3. **M. Taki**, Combinatorially Screened Peptide as Targeted Covalent Binder, ICBMBB2018, Kuala Lumpur, 2018/08/15.
4. **M. Taki**, Turn-on and color-changeable fluorogenic sensor created by the 10BASEd-T, ICONAN2016, Paris, 2016/09/28.
5. **M. Taki**, H. Inoue, K. Mochizuki, Turn-on and color-changeable fluorogenic sensor created by the 10BASEd-T, 52nd Japanese Peptide Symposium, 2015/11/18.
6. **M. Taki**, T. Hamamoto, M. Sisido, Synthesis of cyclic peptides/proteins using the NEXT-A/Cyclization reaction, 4th European Conference on Chemistry for Life Sciences (4ECCLS), Budapest, 2011/09
7. **M. Taki**, T. Hamamoto, and M. Sisido, Synthesis of cyclic peptides using the NEXT-A reaction, PACIFICHEM2010, Hawaii, 2010/12/17.
8. H. Kuroiwa, M. Sisido, **M. Taki**, N-terminal specific ^{18}F-labeling of peptides and proteins, PACIFICHEM2010, Hawaii, 2010/12/16.
9. **M. Taki**, K. Ebisu, M. Sisido, N-TERMINAL SPECIFIC POINT-IMMOBILIZATION OF PEPTIDE/PROTEIN BY THE ONE-POT NEXT-A REACTION, International Conference of 46th Japanese Peptide Symposium and 5th Peptide Engineering Meeting, Kokura, 2009/11/05.
10. **M. Taki**, H. Kuroiwa, and M. Sisido、The NEXT-A reaction, 6th Int. Conf. of Nucleic Acids Chemistry, Takayama, 2009/09/29.
11. **M. Taki**, K. Ebisu, and M. Sisido、Tag-Free N-Terminal Specific Immobilization of Lectin via the NEXT-A Reaction for Sugar Detection, EuroAnalysis2009, Innsbruck (Austria), 2009/09/07.
12. **M. Taki**, Y. Yamazaki, M. Sisido, Position-specific incorporation of blue-laser excitable fluorescent amino acids into peptides, International Conference of 43rd Japanese Peptide Symposium and 4th Peptide Engineering Meeting, Yokohama, 2006/11/06.