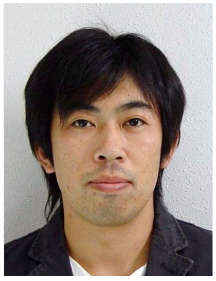

# Satoshi Ichikawa

**Contact details:**

Phone: 81-11-706-3228 Fax: 81-11-706-4980

E-mail: ichikawa@pharm.hokudai.ac.jp

**Education/Career:**

**1994:** B.S. from Faculty of Pharmaceutical Science, Hokkaido University (Prof. Akira Matsuda)

**1996:** M. S. from Graduate School of Pharmaceutical Science, Hokkaido University (Prof. Akira Matsuda)

**1999:** Ph. D. from Graduate School of Pharmaceutical Science, Hokkaido University (Prof. Akira Matsuda)

**1999-2001**: Postdoc, The Scripps Research Institute (Prof. Dale L. Boger)

**2001-2009**: Assistant Professor, Faculty of Pharmaceutical Science, Hokkaido University (Prof. Akira Matsuda)

**2009-2014**: Associate Professor, Faculty of Pharmaceutical Science, Hokkaido University (Prof. Akira Matsuda)

**2015-current**: Professor, Center for Research and Education on Drug Discovery, Faculty of Pharmaceutical Science, Hokkaido University

**Research Interests**

Synthetic organic chemistry, Medicinal chemistry, Total synthesis, Development of antibacterial and anticancer agents

**Scientific Activities, Honors, Awards, Responsibilities:**

The Pharmaceutical Society of Japan, Hokkaido Division Award for Young Scientists (2005)

The Pharmaceutical Society of Japan Award for Young Scientists (2008)

**Original papers**

1. Kitahata, Shun; Chiba, Takuya; Yoshida, Takashi; Ri, Masaki; Iida, Shinsuke; Matsuda, Akira; Ichikawa, Satoshi.* **Design, synthesis and biological activity of isosyringolin A.** *Org. Lett*. **2016**, *18*, 2312-2315. DOI: 10.1021/acs.orglett.6b01053
2. Chung, C. Ben; Mashalidis, H. Ellene; Tanino, Tetsuya; Kim, Mijung; Matsuda, Akira; Hong, Jiyong; Ichikawa, Satoshi; Lee, Seok-Yong.* **Structural insights into inhibition of lipid I production in bacterial cell wall synthesis.** *Nature*, **2016**, *accepted*. DOI:10.1038/nature17636
3. Tsukamoto, Yoshihiro; Ohtsu, Naoki; Echizenya, Smile; Otsuguro, Satoko; Ogura, Ryosuke; Natsumeda, Manabu; Isogawa, Mizuho; Aoki, Hiroshi; Ichikawa, Satoshi; Sakaitani, Masahiro; Matsuda, Akira; Maenaka, Katsumi; Fujii, Yukihiko; Kond, Toru.* **Chemical screening identifies EUrd as a novel inhibitor against Temozolomide-resistant glioblastoma-initiating cells**. *Stem Cells* **2016**, *accepted.* DOI: 10.1002/stem.2380
4. Chiba, Takuya; Shun, Kitahata; Matsuda, Akira; Ichikawa, Satoshi.* **Design, synthesis and biological evaluation of a structurally simplified syringoin A Analogues.** C*hem. Pharm. Bull*. **2016**, *accepted*.
5. Nakaya, Takeshi; Matsuda, Akira; Ichikawa, Satoshi*. **Design, synthesis and biological evaluation of 5′-*C*-piperidinyl-5′-*O*-aminoribosyluridines as a potential antibacterial agent.** *Org. Biomol. Chem*. **2015**, *14*, 7720-7735. DOI: 10.1039/c5ob01037c
6. Chiba, Takuya; Matsuda, Akira; Ichikawa, Satoshi*. **Structure–activity relationship study of syringolin A as a potential anticancer agent**. *Bioorg. Med. Chem. Lett*. **2015**, *25*, 4872-4877. DOI:10.1016/j.bmcl.2015.06.015
7. Ichikawa, Satoshi*; Yamaguchi, Mayumi; Hsuan, Lee Shang; Kato, Yuta; Matsuda, Akira. **Carbacaprazamycins: chemically stable analogues of the caprazamycin nucleoside antibiotics.** *ACS Infect. Dis.* **2015**, *1*, 151-156. DOI: 10.1021/id5000376
8. Yamaguchi, Mayumi; Matsuda, Akira; Ichikawa, Satoshi*. **Synthesis of isoxazolidine-containing uridine derivatives as caprazamycin analogues**. *Org. Biomol. Chem*. **2014**, *13*, 1187-1197. DOI: 10.1039/c4ob02142h
9. Takeoka, Yusuke; Tanino, Tetsuya; Sekiguchi, Mitsuaki; Yonezawa, Shuji; Sakagami, Masahiro; Takahashi, Fumiyo; Togame, Hiroko; Tanaka, Yoshikazu; Takemoto, Hiroshi;

Ichikawa, Satoshi*; Matsuda. Akira. **Expansion of antibacterial spectrum of muraymycins toward *Pseudomonas aeruginosa*.** *ACS Med. Chem. Lett.* **2014**, *5*, 556-560. DOI: 10.1039/c4ob02142h

10. Chiba, Takuya; Hosono, Hidetaka; Nakagawa, Koji; Asaka, Masahiro; Takeda, Hiroshi; Matsuda, Akira; Ichikawa, Satoshi.* **Total synthesis of syringolin A and its improvement of biological activity.** *Angew. Chem. Int. Ed.* **2014**, *126*, 4936-4939. DOI: 10.1002/ange.201402428
11. Katayama, Katsushi; Okamura, Takuya; Sunadome, Takuya; Nakagawa, Koji; Takeda, Hiroshi; Shiro, Motoo; Matsuda, Akira; Ichikawa, Satoshi.* **Synthesis and biological evaluation of quinaldopeptin**. *J. Org. Chem*. **2014**, *79*, 2580-2590. DOI: 10.1021/jo500039d
12. Tanino, Tetsuya; Yamaguchi, Mayumi; Matsuda, Akira; Ichikawa, Satoshi.* **Function-oriented synthesis of liponucleoside natural products.** *Eur. J. Org. Chem*. **2014**, 1836-1840. DOI: 10.1002/ejoc.201400140
13. Katayama, Katsushi; Nakagawa, Koji; Takeda, Hiroshi; Matsuda, Akira; Ichikawa, Satoshi.* **Total synthesis of sandramycin and its analogues via a multi-component assemblage.** *Org. Lett.* **2014**, *16*, 428-431. DOI: 10.1021/ol403319m
14. Ichikawa, Satoshi*; Takuya, Okamura, Matsuda, Akira. **Total synthesis of quinaldopeptin and its analogues.** *J. Org. Chem*. **2013**, *78*, 12662-12670. DOI: 10.1021/jo402267r
15. Ichikawa, Satoshi*; Tatebayashi, Nana; Matsuda, Akira. **Synthesis of *C*-glycosyl pyrrolo[3,4-*c*]carbazole-1,3(*2H*,*6H*)-diones as a scaffold for check point 1 kinase inhibitors.** *J. Org. Chem*. **2013**, *78*, 12065-12075. DOI: 10.1021/jo4020672
16. Ichikawa, Satoshi*; Ueno, Hideaki; Sunadome, Takuya; Sato, Kousuke; Matsuda, Akira. **Tris(azidoethyl)amine hydrochloride; a versatile reagent for synthesis of functionalized dumbbell oligodeoxynucleotides.** *Org. Lett.* **2013**, *15*, 694-697. DOI: 10.1021/ol400001w (*Selected as JACS Selected Issue 'Nucleic Acids: Chemistry and Application'*)
17. Okamoto, Kazuya; Sakagami, Masahiro; Feng, Fei; Fumiyo, Takahashi; Kouichi, Uotani; Togame, Hiroko; Takemoto, Hiroshi; Ichikawa, Satoshi*; Matsuda Akira.* **Synthesis of pacidamycin analogue via an Ugi-multicomponent reaction.** *Bioorg. Med. Chem. Lett.*

**2012**, *22*, 4810-4815. DOI:10.1016/j.bmcl.2012.05.050

18. Okamoto, Kazuya; Sakagami, Masahiro; Feng, Fei; Togame, Hiroko; Takemoto, Hiroshi; Ichikawa, Satoshi*; Matsuda Akira.* **Total synthesis and biological evaluation of pacidamycin D and its 3′-hydroxy analogue.** *J. Org. Chem*. **2012**, *77*, 1367-1377.
19. Muranaka, Kazuhiro; Ichikawa, Satoshi*; and Matsuda, Akira.* **Development of the carboxamide protecting group, 4-(*tert*-butyldimethylsiloxy)-2-methoxy-benzyl.** *J. Org. Chem*. **2011**, *76*, 9278-9293. DOI: 10.1021/jo202159q
20. Okamoto, Kazuya; Sakagami, Masahiro; Feng, Fei; Togame, Hiroko; Takemoto, Hiroshi; Ichikawa, Satoshi*; Matsuda Akira*. **Total synthesis of pacidamycin D by $Cu^{(I)}$-catalyzed oxy enamide formation.** *Org. Lett.* **2011**, *13,* 5240-5243. DOI: 10.1021/ol202124b
21. Tanino, Tetsuya; Al-Dabbagh, Bayan; Mengin-Lecreulx, Dominique; Bouhss, Ahmed; Oyama, Hiroshi; Ichikawa, Satoshi*; and Matsuda, Akira. **Mechanistic analysis of muraymycin analogues: a guide to the design of MraY inhibitors.** *J. Med. Chem.* **2011**, *54*, 8421-8439. DOI: 10.1021/jm200906r
22. Tanino, Tetsuya; Ichikawa, Satoshi*; Matsuda, Akira. **Synthesis of L-*epi*-capreomycidine derivatives via C-H amination.** *Org. Lett.* **2011**, *13,* 4028-4031. DOI: 10.1021/ol201527k
23. Furuita, Kyoko; Murata, Shunpei; Jee, Jun Goo; Ichikawa, Satoshi; Matsuda, Akira; Kojima, Chojiro.* **Structural feature of DNA recognized by HMGB1.** *J. Am. Chem. Soc.* **2011**, *133*, 5788-5790. DOI: 10.1021/ja2013399
24. Sako, Yuki; Osada, Akiko; Ichikawa, Satoshi*; Matsuda, Akira.* **Synthesis and evaluation of 5-substituted 9-hydroxypyrrolo[3,4-*c*]carbazole-1,3(*2H*,*6H*)-diones as check point 1 kinase inhibitors.** *Bioorg. Med. Chem*. **2010**, *18*, 7878-7889. DOI:10.1016/j.bmc.2010.09.042
25. Sekiguchi, Hironori; Muranaka, Kazuhiro; Osada, Akiko; Ichikawa, Satoshi*; Matsuda, Akira.* **Efficient synthesis of Hsp90 inhibitor dimers as potential antitumor agents.** *Bioorg. Med. Chem*. **2010**, *18*, 7732-5737. DOI:10.1016/j.bmc.2010.05.075
26. Tanino, Tetsuya; Ichikawa, Satoshi*; Al-Dabbagh, Bayan; Bouhss, Ahmed; Matsuda, Akira.* **Synthesis and biological evaluation of muraymycin analogues as potential anti-drug-resistant bacterial.** *ACS Med. Chem. Lett*. **2010**, *1*, 258-262. DOI: 10.1021/ml100057z (*Highlighted article*)

27. Ii, Kensuke; Ichikawa, Satoshi*; Al-Dabbagh, Bayan; Bouhss, Ahmed; Matsuda, Akira.* **Function-oriented synthesis of simplified caprazamycins: discovery of oxazolidine-containing uridine derivatives as antibacterial agents against drug-resistant bacteria.** *J. Med. Chem*. **2010**, *53*, 3793-3813. DOI: 10.1021/jm100243n
28. Kaysser, Leonard; Eitel, Kornelia; Tanino, Tetsuya; Siebenberg, Stefanie; Matsuda, Akira; Ichikawa, Satoshi; Gust, Bertolt.* **A new ASST-type sulfotransferase involved in liponucleoside antibiotic biosynthesis in Streptomycetes.** *J. Biol. Chem*. **2010**, *285*, 12684-12694. DOI: 10.1074/jbc.M109.094490
29. Tanino, Tetsuya; Ichikawa, Satoshi*; Shiro, Motoo; Matsuda, Akira.* **Total synthesis of (−)-muraymycin D2 and its epimer.** *J. Org. Chem.* **2010**, *75*, 1366-1377. DOI: 10.1021/jo9027193 *(Featured article)*
30. Muranaka, Kazuhiro; Ichikawa, Satoshi*; Matsuda, Akira.* **Design and synthesis of 3',5'-ansa-adenosines as potential Hsp90 inhibitors.** *Tetrahedron Lett.* **2009**, *50*, 5102-5106.
31. Ichikawa, Satoshi*; Hayashi, Ryoko; Hirano, Shinpei; Matsuda, Akira. **Highly β-selective *C*-allylation of a ribofuranoside controlling steric hindrance in the transition state.** *Org. Lett.* **2008**, *10,* 5107-5110.
32. Muranaka, Kazuhiro; Sano, Akiko; Ichikawa, Satoshi*; Matsuda, Akira.* **Synthesis of Hsp90 inhibitor dimers as potential antitumor agents.** *Bioorg. Med. Chem.* **2008***, 16,* 5862-5870.
33. Nakane, Masanori; Ichikawa, Satoshi*; Matsuda, Akira.* **Triazole-linked dumbbell oligodeoxynucleotides with NF-κB binding ability as new decoy molecules.** *J. Org. Chem*. **2008**, *73,* 1842-1851.
34. Hirano, Shinpei; Ichikawa, Satoshi*; Matsuda, Akira.* **Structure-activity relationship of truncated analogs of caprazamycins as potential anti-tuberculosis agents.** *Bioorg. Med. Chem.* **2008***, 16,* 5123-5133.
35. Hirano, Shinpei; Ichikawa, Satoshi*; Matsuda, Akira.* **Synthesis of caprazamycin analogs and their structure-activity relationship for antibacterial activity.** *J. Org. Chem.* **2008**, *73*, 569-577.
36. Hirano, Shinpei; Ichikawa, Satoshi*; Matsuda, Akira.* **Design and synthesis of diketopiperazine and acyclic analogs related to the caprazamycins and**

**liposidomycins as potential antibacterial agents.** *Bioorg. Med. Chem*. **2008**, *16*, 428-436.

37. Ichikawa, Satoshi* **Fine synthetic nucleoside chemistry based on nucleoside natural products synthesis.** *Chem. Pharm. Bull.* **2008**, *56*, 1059-1072.
38. Hirano, Shinpei; Ichikawa, Satoshi*; Matsuda, Akira.* **Development of a highly β-selective ribosylation reaction without using neighboring group participation: total synthesis of (+)-caprazol, a core structure of caprazamycins.** *J. Org. Chem.* **2007**, *72*, 9936-9946.
39. Murata, Shunpei; Muzumura, Youko; Hino, Kaori; Ueno, Yoshihito; Ichikawa, Satoshi*; Matsuda, Akira.* **Modular bent DNAs: A new class of artificial DNAs with a protein binding ability.** *J. Am. Chem. Soc.* **2007**, *129*, 10300-10301. *(Highlighted by Chemical & Engineering News)*
40. Miyauchi, Seiji; Gopal, Elangovan; Thakkar, Santosh V.; Ichikawa, Satoshi; Prasad, Puttur D.; Ganapathy, Vadivel.* **Differential modulation of sodium- and chloride-dependent opioid peptide transport system by small nonopioid peptides and free amino acids.** *J. Pharmacol. Exp. Ther.* **2007**, *321*, 257-264.
41. Ohtawa, Masaki; Ichikawa, Satoshi*; Teishikata, Yasuhiro; Fujimuro, Masahiro; Yokosawa, Hideyoshi; Matsuda, Akira.* **9-(2-*C*-Cyano-2-deoxy-β -D-arabino-pentofuranosyl)guanine, a potential antitumor agent against B-lymphoma infected with Kaposi's sarcoma-associated herpesvirus.** *J. Med. Chem.* **2007**, *50*, 2007-2010.
42. Hirano, Shinpei.; Ichikawa, Satoshi*; Matsuda, Akira.* **Total synthesis of (+)-FR-900493 and establishment of its absolute stereochemistry.** *Tetrahedron* **2007**, *63*, 2798-2804.
43. Ichikawa, Satoshi*; Minakawa, Noriaki; Shuto, Satoshi; Tanaka, Motohiro; Sasaki Takuma; Matsuda, Akira.* **Synthesis of 3'-β-carbamoylmethylcytidine (CAMC) and its derivatives as potential antitumor agents.** *Org. Biomol. Chem.* **2006**, *4*, 1284-1294.
44. Ichikawa, Satoshi*; and Matsuda, Akira. **Synthesis of complex nucleoside antibiotics.** *Nucleosides, Nucleotides & Nucleic Acids* **2005**, *24*, 319-329.
45. Kudoh, Takashi; Fukuoka, Masayoshi; Ichikawa, Satoshi; Murayama, Takashi; Ogawa, Yasuo; Hashii, Minako; Higashida, Haruhiro; Kunerth, Svenja; Weber, Karin; Guse, Andreas H.; Potter, Barry V. L.; Matsuda, Akira; Shuto, Satoshi.* **Synthesis of stable**

**and cell-type selective analogues of cyclic ADP-ribose, a $Ca^{2+}$-mobilizing second messenger. Structure-activity relationship of the N1-ribose moiety.** *J. Am. Chem. Soc*. **2005**, *127*, 8846-8855.

46. Murata, Shunpei; Ichikawa, Satoshi; Matsuda, Akira.* **Synthesis of galactose-linked uridine derivatives with simple linkers as potential galactosyltransferase inhibitors.** *Tetrahedron* **2005***, 61,* 5837-5842.
47. Hirano, Shinpei; Ichikawa, Satoshi*; Matsuda, Akira.* **Total synthesis of caprazol, a core structure of the caprazamycin antituberculosis antibiotics.** *Angew. Chem. Int. Ed.* **2005**, *44*, 1854-1856.
48. Terauchi, Masaru; Yahiro, Yumi; Abe, Hiroshi; Ichikawa, Satoshi; Tovey, Stephen C.; Dedos, Skarlatos G.; Taylor, Colin W.; Potter, Barry V. L.; Matsuda, Akira; Shuto, Satoshi.* **Synthesis of 4,8-anhydro-D-glycero-D-ido-nonanitol 1,6,7-trisphosphate as a novel $IP_3$ receptor ligand using a stereoselective radical cyclization reaction based on a conformational restriction strategy.** *Tetrahedron* **2005**, *61*, 3697-3707.
49. Yamamoto, Yuji; Shuto, Satoshi; Tamura, Yutaka; Kodama, Tetsuya; Hoshika, Shuichi; Ichikawa, Satoshi; Ueno, Yoshihito; Ohtsuka, Eiko; Komatsu, Yasuo; Matsuda, Akira.* **Oligodeoxynucleotides having a loop consisting of 3'-deoxy-4'-*C*-(2-hydroxyethyl)thymidines form stable hairpins.** *Biochemistry* **2004**, *43*, 8690-8699.
50. Ichikawa, Satoshi*; Matsuda, Akira.* **Synthesis of tunicaminyluracil derivatives.** *Nucleosides, Nucleotides & Nucleic Acids* **2004**, *23*, 239-253.
51. Buck, Suzanne B.; Hardouin, Christophe; Ichikawa, Satoshi; Soenen, Danielle R.; Gauss, C.-M.; Hwang, Inkyu; Swingle, Mark R.; Bonness, Kathy M.; Honkanen, Richard E.; Boger, Dale L.* **Fundamental role of the fostriecin unsaturated lactone and implications for selective protein phosphatase inhibition.** *J. Am. Chem. Soc.* **2003**, *125*, 15694-15695.
52. Sukeda, Makoto; Ichikawa, Satoshi; Matsuda, Akira*; Shuto, Satoshi.* **The first radical method for the introduction of an ethynyl group using a silicon tether and its application to the synthesis of 2'-deoxy-2'-*C*-ethynylnucleosides.** *J. Org. Chem.* **2003**, *68*, 3465-3475.
53. Sukeda, Makoto; Ichikawa, Satoshi; Matsuda, Akira*; Shuto, Satoshi.* **A new entry to the stereoselective introduction of an ethynyl group by a radical reaction: synthesis of the potential antimetabolite 2'-deoxy-2'-*C*-ethynyluridine.** *Angew. Chem. Int. Ed.*

**2002**, *41*, 4748-4750.

54. Kodama, Tetsuya; Shuto, Satoshi; Ichikawa, Satoshi; Matsuda, Akira.* **A Highly stereoselective samarium diiodide-promoted aldol reaction with 1'-phenylseleno-2'-keto nucleosides. Synthesis of 1'α-branched uridine derivatives.** *J. Org. Chem*. **2002**, *67*, 7706-7715.
55. Boger, Dale L.*; Ichikawa, Satoshi; Zhong, Wenge. **Total synthesis of fostriecin (CI-920).** *J. Am. Chem. Soc*. **2001**, *123*, 4161-4167.
56. Boger, Dale L.*; Ichikawa, Satoshi; Tse, Winston C.; Hedrick, Michael P.; Jin, Qing. **Total syntheses of thiocoraline and BE-22179 and assessment of their DNA binding and biological properties.** *J. Am. Chem. Soc.* **2001**, *123*, 561-568.
57. Boger, Dale L.; Ichikawa, Satoshi; Jiang, Hongjian. **Total synthesis of the rubrolone aglycon.** *J. Am. Chem. Soc.* **2000**, *122*, 12169-12173.
58. Boger, Dale L*; Ichikawa, Satoshi. **Total syntheses of thiocoraline and BE-22179: establishment of relative and absolute stereochemistry.** *J. Am. Chem. Soc*. **2000**, *122*, 2956-2957.
59. Sukeda, Makoto; Shuto, Satoshi; Sugimoto, Isamu; Ichikawa, Satoshi; Matsuda, Akira.* **Synthesis of pyrimidine 2'-deoxy ribonucleosides branched at the 2'-position via radical atom-transfer cyclization reaction with a vinylsilyl group as a radical-acceptor tether.** *J. Org. Chem*. **2000**, *65*, 8988-8996.
60. Shuto, Satoshi; Yahiro, Yumi; Ichikawa, Satoshi; Matsuda, Akira.* **Synthesis of 3,7-anhydro-D-*glycero*-D-*ido*-octitol 1,5,6-trisphosphate as an $IP_3$ receptor ligand using a radical cyclization reaction with a vinylsilyl tether as the key step. Conformational restriction strategy using steric repulsion between adjacent bulky protecting groups on a pyranose ring.** *J. Org. Chem*. **2000**, *65*, 5547-5557.
61. Shuto, Satoshi; Terauchi, Masaru; Yahiro, Yumi; Abe, Hiroshi; Ichikawa, Satoshi; Matsuda, Akira.* **Stereoselective synthesis of α- and β-*C*-glucosides via radical cyclization with an allylsilyl tether. Control of the stereoselectivity by changing the conformation of the pyranose ring.** *Tetrahedron Lett.* **2000**, *41*, 4151-4155.
62. Ichikawa, Satoshi; Shuto, Satoshi; Matsuda, Akira.* **The first synthesis of herbicidin B. Stereoselective construction of the tricyclic undecose moiety by a conformational restriction strategy using steric repulsion between adjacent bulky silyl protecting**

**groups on a pyranose ring.** *J. Am. Chem. Soc.* **1999**, *121*, 10270-10280.

63. Yahiro, Yumi; Ichikawa, Satoshi; Shuto, Satoshi; Matsuda, Akira.* **Synthesis of *C*-glycosides via radical cyclization reactions with a vinylsilyl tether. Control of the reaction course by a change in the conformation of the pyranose ring due to steric repulsion between adjacent bulky protecting groups.** *Tetrahedron Lett*. **1999**, *40*, 5527-5531.
64. Ichikawa, Satoshi; Shuto, Satoshi; Matsuda, Akira.* **A novel aldol-type *C*-glycosidation reaction promoted by samarium diiodide. Regioselective generation of a ulose-1-enolate from phenyl 3,4,6-tri-*O*-benzyl-1-thio-β-D-arabino-hexopyranosid-2-ulose.** *Tetrahedron Lett*. **1998**, *39*, 4525-4528.
65. Shuto, Satoshi; Kanazaki, Makiko; Ichikawa, Satoshi; Minakawa, Noriaki; Matsuda, Akira.* **Stereo- and regioselective introduction of 1- or 2-hydroxyethyl group via intramolecular radical cyclization reaction with a novel silicon-containing tether. An efficient synthesis of 4'α-branched 2'-deoxyadenosines.** *J. Org. Chem*. **1998**, *63*, 746-754.
66. Shuto, Satoshi; Kanazaki, Makiko; Ichikawa, Satoshi; Matsuda, Akira.* **A novel ring-enlargement reaction of (3-oxa-2-silacyclopentyl)methyl radicals into 3-oxa-2-silacyclohexyl radicals. Stereoselective introduction of a hydroxyethyl group via unusual 6-endo-cyclization products derived from 3-oxa-4-silahexenyl radicals and its application to the synthesis of a 4'-α-branched nucleoside.** *J. Org. Chem.* **1997**, *62*, 5676-5677.
67. Ichikawa, Satoshi; Shuto, Satoshi; Minakawa, Noriaki; Matsuda, Akira.* **Synthesis of 3'-β-branched uridine derivatives via intramolecular Reformatsky-type reaction promoted by samarium diiodide.** *J. Org. Chem*. **1997**, *62*, 1368-1375.

**Reviews**

68. 千葉拓也、仲谷岳志、片山勝史、松田彰、市川聡*、**多成分反応を用いた天然物合成と構造活性相関研究**、有機合成化学協会誌、**2016**, *accepted*.
69. Ichikawa, Satoshi. F**unction-oriented Synthesis: How to Design Simplified Analogues of Antibacterial Nucleoside Natural Products?** *Chem. Rec.* **2016**, *accepted*.
70. Ichikawa, Satoshi; Yamaguchi, Mayumi; Matsuda, Akira. **Antibacterial nucleoside**

**natural products inhibiting phospho-MurNAc-pentapeptide translocase; chemistry and structure-activity relationship.** *Current Med. Chem.* **2015**, *22*, 3951-3979.

71. 千葉拓也、松田彰、市川聡*、**躍進するプロテアソーム阻害剤：変革する多発性骨髄腫治療薬**、化学、**2014**, *69*, 70-71.
72. 市川聡*、松田彰、**ヌクレオシド系天然物の全合成を基盤とした抗薬剤耐性菌シーズの創製研究**、有機合成化学協会誌、**2011**, *69*, 1020-1033.
73. 谷野哲也、市川聡、魚谷幸一、大山洋、松田彰*、**新規抗菌剤開発を指向したMraY阻害天然物ムライマイシン類の合成研究**、薬学雑誌、**2011**, *131*, 335-346
74. 市川聡*、松田彰、**新たな切り口で結核菌と戦う！**、化学、**2010**, *65*, 30-34.
75. 市川聡*、**精密有機合成化学に基づいたヌクレオシドと核酸の創薬研究**、薬学雑誌、**2008**, *128*, 1403-1430.
76. Ichikawa, Satoshi*; Matsuda, Akira. **Nucleoside natural products and related analogs with potential therapeutic properties as antibacterial and antiviral agents.** *Expert Opin. Ther. Pat.* **2007**, *17*, 487-498.
77. 市川聡*、**核酸系抗生物質の合成研究**、薬学雑誌、**2006**, *126*, 579-595.
78. Shuto, Satoshi; Kanazaki, Makiko; Sugimoto, Isamu; Ichikawa, Satoshi; Nagasawa, Yuki; Ueno, Yoshihito; Abe, Hiroshi; Minakawa, Noriaki; Sukeda, Makoto; Kodama, Tetsuya; Nomura, Makoto; Matsuda, Akira.* **Development of new radical reactions with a vinylsilyl group and their application to the synthesis of branched-chain sugar nucleosides.** *Recent Advances in Nucleosides* **2002**, 21-55 (Elsevier Science).

**Patents**

79. Matsuda, Akira and Ichikawa, Satoshi. **Nucleoside-type antibiotic derivative.** WO 2010101061A.
80. Matsuda, Akira and Ichikawa, Satoshi. **Nucleoside-type antibiotic containing muraymycin derivatives.** WO 2010098365A.
81. Ichikawa, Satoshi; Sako, Yuki; Matsuda, Akira; Osada, Akiko. **Pyrrolocarbazoledione compounds, and pharmaceutical compositions, antitumor agents, antitumor activity enhancers, and checkpoint kinase 1 inhibitors containing them.** JP2020205920A.

82. Muranaka, Kazuhiro; Ichikawa, Satoshi; Matsuda, Akira; Sano, Akiko. **Purine dimers or their salts, and their use for pharmaceuticals and antitumor agents.** JP2009107939A.
83. Ichikawa, Satoshi; Fujimuro, Masahiro; Matsuda, Akira. **Nucleoside derivative having antiherpesvirus activity.** WO2007119624A.

**Invited lectures**

84. 市川聡、生理活性天然物を基盤とする創薬化学、創薬懇話会in藁科、2016年月30日、長野
85. 市川聡、天然物の改変による新規プロテアソーム阻害剤の開発研究、日本生化学会北海道支部例会、2015年7月17日、札幌
86. 市川聡、シリンゴリン類の構造活性相関研究、新学術領域研究「天然物ケミカルバイオロジー：分子標的と活性制御」地区ミニシンポジウム・仙台「ケミカルバイオロジーにおける天然物」、2015年6月30日、仙台
87. Ichikawa Satoshi, Medicinal chemistry based on natural products, Taipei Medical University, 2015, March, 17th, Taipei, Taiwan.
88. 市川聡、ヌクレオシド系天然物による創薬基盤研究、日本薬学会第134年会シンポジウム「天然物ケミカルバイオロジー（2）」、2014年3月、熊本
89. 市川聡、Liponucleoside natural products: synthesis and structure-activity relationship、日本化学会東北支部70周年記念国際会議、2013年9月、仙台
90. 市川聡、新規抗菌剤のシードとしてのヌクレオシド系天然物：合成とその生物活性、第21回未来創薬・医療イノベーションセミナー、2013年9月、札幌
91. Ichikawa, Satoshi. Liponucleoside natural products: synthesis and structure-activity relationship. 3rd International SFB 766 **(The Bacterial Cell Envelope: Structure, Function, and Infection Interface)** Symposium, 2013, May, Irsee, Germany.
92. 市川聡、天然物を用いる創薬化学、第27回生体機能関連若手フォーラム、2012年9月、札幌
93. 市川聡、新規抗菌剤の開発を指向した天然物の単純化プロセス、日本薬学会第132年会シンポジウム「創薬を革新するプロセス化学」、2012年3月、札幌

94. 市川聡、ヌクレオシド系天然物をリードとした新規抗菌剤の開発研究（招待講演）、メディシナルケミストリーシンポジウム「若手研究シンポジウム」、2009年11月、東京
95. 市川聡、新規抗菌剤の創成を目指したヌクレオシド系抗生物質の合成研究、有機合成化学協会東海支部「若手研究者のためのセミナー」、2009年7月、静岡
96. 市川聡、ヌクレオシドを基盤とした創薬研究、有機合成化学協会北海道支部「若手研究者のためのセミナー」、2008年11月、札幌
97. Ichikawa, Satoshi. Chemistry and structure-activity relationship of antibacterial nucleoside natural products. XVIII International Round Table on Nucleosides, Nucleotides and Nucleic Acids, 2008, September, 12th, Kyoto, Japan.
98. 市川聡、核酸系天然物の合成研究を基軸とした精密ヌクレオシド合成化学（日本薬学会奨励賞受賞講演）、2008年3月、横浜
99. 市川聡、新規作用機序を有する抗結核核酸系抗生物質の合成研究、第125回日本薬学会北海道支部例会（日本薬学会北海道支部奨励受賞講演）、2005年12月、札幌
100. Ichikawa, Satoshi. The synthesis of complex nucleoside antibiotics. XVI International Round Table on Nucleosides, Nucleotides and Nucleic Acids, 2004, September, 15th, Minneapolis, USA.
101.