

CURRICULUM VITAE

Personal information:

Name: Tadanobu Takahashi

Affiliation: Department of Biochemistry,
School of Pharmaceutical Sciences,
Graduate Division of Pharmaceutical Sciences
University of Shizuoka, Japan

Position: Associate Professor

Education:

1995. 4-1999. 3 Graduated from School of Pharmaceutical Sciences,
University of Shizuoka, Japan (with top honors,
Iwasaki Prize)

1999. 4 - 2004. 3 Received the degree of Ph. D. in Pharmaceutical
Science
from Graduate School of Pharmaceutical Sciences,
University of Shizuoka, Japan

Employment:

2004. 4 - 2006. 3 Postdoctoral fellow,
Clarification of the biological functions of sugar
chains and the use of this knowledge in applied
technologies,
Core Research for Evolutional Science and
Technology (CREST), Japan Science and
Technology Agency

2006. 4 - 2007. 4	Research Associate, Department of Pharmaco-Biochemistry, School of Pharmaceutical Sciences, University of Shizuoka, Japan
2007. 5 - 2013. 3	Research Assistant Professor, Department of Biochemistry, School of Pharmaceutical Sciences, University of Shizuoka, Japan
2010. 4 - 2011. 3	Visiting scientist, Influenza Research Institute, Department of Pathobiological Sciences, School of Veterinary Medicine, University of Wisconsin-Madison, USA
2013. 4 - 2015. 5	Assistant Professor Department of Biochemistry, School of Pharmaceutical Sciences, University of Shizuoka, Japan
2015. 6 - Present	Associate Professor Department of Biochemistry, School of Pharmaceutical Sciences, University of Shizuoka, Japan

Scientific Achievements

Major Academic Papers:

1. Tadanobu Takahashi, Saori Unuma, Sawako Kawagishi, Yuuki Kurebayashi, Maiko Takano, Hiroki Yoshino, Akira Minami, Takashi Yamanaka, Tadamune Otsubo, Kiyoshi Ikeda, Takashi Suzuki. Substrate specificity of equine and human influenza A virus sialidase to molecular species of sialic acid.

Biol. Pharm. Bull. 39, 1728-1733 (2016)

2. Yuuki Kurebayashi*, Tadanobu Takahashi* (*These authors contributed equally to this work), Chihiro Tamoto, Keiji Sahara, Tadamune Otsubo, Tatsuya Yokozawa, Nona Shibahara, Hirohisa Wada, Akira Minami, Kiyoshi Ikeda, Takashi Suzuki. High-efficiency capture of drug resistant-influenza virus by live imaging of sialidase activity.

PLoS One 11, e0156400 (2016)

3. Tadanobu Takahashi, Takashi Agarikuchi, Yuuki Kurebayashi, Nona Shibahara, Chihiro Suzuki, Akiko Kishikawa, Keijo Fukushima, Maiko Takano, Fumie Suzuki, Hirohisa Wada, Tadamune Otsubo, Kiyoshi Ikeda, Akira Minami, Takashi Suzuki. Easy and Rapid Detection of Mumps Virus by Live Fluorescent Visualization of Virus-Infected Cells.

PLoS One 10, e0144038 (2015)

4. Tadanobu Takahashi, Sawako Kawagishi, Hiroki Funahashi, Nonoka Hayashi, Takashi Suzuki. Production and purification of secretory simian cytidine monophosphate-*N*-acetyl neuraminic acid hydroxylase by using baculovirus-protein expression system.

Biol. Pharm. Bull. 38, 1220-1226 (2015)

5. Tadanobu Takahashi*, Maiko Takano* (*they contributed equally as first authors), Yuuki Kurebayashi, Takashi Agarikuchi, Chihiro Suzuki, Keijo Fukushima,

Shunsaku Takahashi, Tadamune Otsubo, Kiyoshi Ikeda, Akira Minami, Takashi Suzuki. Rapid fluorescent detection assay for human parainfluenza viruses.

Biol. Pharm. Bull. 38, 1214-1219 (2015)

6. Keijo Fukushima*, Tadanobu Takahashi* (*they contributed equally as first authors), Hiroo Ueyama, Masahiro Takaguchi, Seigo Ito, Kenta Oishi, Akira Minami, Erika Ishitsubo, Hiroaki Tokiwa, Toru Takimoto, Takashi Suzuki. Amino acid substitutions contributing to α 2,6-sialic acid linkage binding specificity of human parainfluenza virus type 3 hemagglutinin-neuraminidase.

FEBS Lett. 589, 1278-1282 (2015)

7. Kentaro Shoji, Tadanobu Takahashi, Kohta Kurohane, Koki Iwata, Takeshi Matsuoka, Shogo Tsuruta, Takatomo Sugino, Masaki Miyake, Takashi Suzuki, Yasuyuki Imai. Recombinant IgA specific for influenza A virus hemagglutinin: production, functional analysis and formation of secretory IgA.

Viral Immunol. 28, 170-178 (2015)

8. Tomohiro Kawahara, Tadanobu Takahashi, Kenta Oishi, Hiromu Tanaka, Midori Masuda, Shunsaku Takahashi, Maiko Takano, Tatsuya Kawakami, Keijo Fukushima, Hiroaki Kanazawa, Takashi Suzuki. Consecutive oral administration of *Bifidobacterium longum* MM-2 improves the defense system against influenza virus infection by enhancing natural killer cell activity in a murine model.

Microbiol. Immunol. 59, 1-12 (2015)

9. Tadanobu Takahashi, Maiko Takano, Takashi Agarikuchi, Yuuki Kurebayashi, Akira Minami, Tadamune Otsubo, Kiyoshi Ikeda, Takashi Suzuki. A novel method for detection of Newcastle disease virus with a fluorescent sialidase substrate.

J. Virol. Methods 209, 136-142 (2014)

10. Tadanobu Takahashi, Tadamune Otsubo, Kiyoshi Ikeda, Akira Minami, Takashi Suzuki. Histochemical imaging of alkaline phosphatase using a novel fluorescent substrate.

Biol. Pharm. Bull. 37, 1668-1673 (2014)

11. Keijo Fukushima*, Tadanobu Takahashi* (*they contributed equally as first authors), Seigo Ito, Masahiro Takaguchi, Maiko Takano, Yuuki Kurebayashi, Kenta Oishi, Akira Minami, Tatsuya Kato, Enoch Y Park, Hidekazu Nishimura, Toru Takimoto, Takashi Suzuki. Terminal Sialic Acid Linkages Determine Different Cell Infectivities of Human Parainfluenza Virus Type 1 and Type 3.
Virology 464-465, 424-431 (2014)

12. Tadanobu Takahashi, Maiko Takano, Yuuki Kurebayashi, Midori Masuda, Sawako Kawagishi, Masahiro Takaguchi, Takashi Yamanaka, Akira Minami, Tadamune Otsubo, Kiyoshi Ikeda, Takashi Suzuki. *N*-glycolylneuraminic Acid on Human Epithelial Cells Prevents Entry of Influenza A Virus with *N*-glycolylneuraminic Acid Binding Ability.
J. Virol. 88, 8445-8456 (2014)

13. Yuuki Kurebayashi*, Tadanobu Takahashi* (*these authors contributed equally to this work), Tadamune Otsubo, Kiyoshi Ikeda, Shunsaku Takahashi, Maiko Takano, Takashi Agarikuchi, Tsubasa Sato, Yukino Matsuda, Akira Minami, Hiroaki Kanazawa, Yuko Uchida, Takehiko Saito, Yoshihiro Kawaoka, Toshihiro Yamada, Fumihiko Kawamori, Robin Thomson, Mark von Itzstein, Takashi Suzuki. Imaging of influenza virus sialidase activity in living cells.
Sci. Rep. 4, 4877 (2014)

14. Maiko Takano*, Tadanobu Takahashi* (*they contributed equally as first authors), Takashi Agarikuchi, Yuuki Kurebayashi, Akira Minami, Tadamune Otsubo, Kiyoshi Ikeda, Hiroaki Kanazawa, Takashi Suzuki. Histochemical fluorescent staining of Sendai virus-infected cells with a novel sialidase substrate.
Virology 464-465, 206-212 (2014)

15. Tadanobu Takahashi, Masahiro Takaguchi, Tatsuya Kawakami, Takashi Suzuki. Sulfatide regulates caspase-3-independent apoptosis of influenza A virus through viral PB1-F2 protein.
PLoS One 8, e61092 (2013)

16. Tadanobu Takahashi, Tatsuya Kawakami, Takashi Mizuno, Akira Minami, Yuko Uchida, Takehiko Saito, Shigeyuki Matsui, Makoto Ogata, Taichi Usui, Nongluk Sriwilaijaroen, Hiroaki Hiramatsu, Yasuo Suzuki, Takashi Suzuki. Sensitive and direct detection of receptor binding specificity of highly pathogenic avian influenza A virus in clinical samples.

PLoS One 8, e78125 (2013)

17. Tadanobu Takahashi, Jiasheng Song, Takashi Suzuki, Yoshihiro Kawaoka. Mutations in NA that induced low pH-stability and enhanced the replication of pandemic (H1N1) 2009 influenza A virus at an early stage of the pandemic.

PLoS One 8, e64439 (2013)

18. Reiko Nishino, Takuya Hayakawa, Tadanobu Takahashi, Takashi Suzuki, Masayuki Sato, Kiyoshi Ikeda. Syntheses of 2-Deoxy-2,3-didehydro-*N*-acetylneuraminic Acid Analogues Modified by α -Acylaminoamido Groups at the C-4 Position Using Isocyanide-Based Four-Component Coupling and Biological Evaluation as Inhibitors of Human Parainfluenza Virus Type 1.

Chem. Pharm. Bull. 61, 69-74 (2013)

19. Tadanobu Takahashi, Chairul A. Nidom, Mai thi QuynhLe, Takashi Suzuki, Yoshihiro Kawaoka. Amino acid determinants conferring stable sialidase activity at low pH for H5N1 influenza A virus neuraminidase.

FEBS Open Bio 2, 261-266 (2012)

20. Tadanobu Takahashi, Kazuhiko Ito, Keijo Fukushima, Masahiro Takaguchi, Takuya Hayakawa, Yasuo Suzuki, and Takashi Suzuki. Sulfatide Negatively Regulates the Fusion Process of Human Parainfluenza Virus Type 3.

J. Biochem. 152, 373-380 (2012)

21. Keijo Fukushima, Tadanobu Takahashi, Masahiro Takaguchi, Hiroo Ueyama, Seigo Ito, Yuuki Kurebayashi, Tomohiro Kawanishi, Jennifer L. Mckimm-Breschkin, Toru Takimoto, Akira Minami, Takashi Suzuki. Plaque formation assay for human

parainfluenza virus type 1.

Biol. Pharm. Bull. 34, 996-1000 (2011)

22. Masahiro Takaguchi, Tadanobu Takahashi, Chika Hosokawa, Hiroo Ueyama, Keijo Fukushima, Takuya Hayakawa, Kazuhiko Itoh, Kiyoshi Ikeda, Takashi Suzuki. A single amino acid mutation at position 170 of human parainfluenza virus type 1 fusion glycoprotein induces obvious syncytium formation and caspase-3-dependent cell death.

J. Biochem. 149, 191-202 (2011)

23. Tadanobu Takahashi, Yuuki Kurebayashi, Kumiko Ikeya, Takashi Mizuno, Keijo Fukushima, Hiroko Kawamoto, Yoshihiro Kawaoka, Yasuo Suzuki, and Takashi Suzuki. The Low-pH Stability Discovered in Neuraminidase of 1918 Pandemic Influenza A Virus Enhances Virus Replication.

PLoS One 5, e15556 (2010)

24. Repon Kumer Saha, Tadanobu Takahashi, Yuki Kurebayashi, Keijo Fukushima, Akira Minami, Noriaki Kinbara, Masaki Ichitani, Yuko M. Sagesaka, Takashi Suzuki. Antiviral effect of strictinin on influenza virus replication.

Antiviral Res. 88, 10-18 (2010)

25. Tadanobu Takahashi, Hiroaki Satoh, Masahiro Takaguchi, Suguru Takafuji, Hideshi Yokoyama, Satoshi Fujii, Takashi Suzuki. Binding of sulfatide to recombinant hemagglutinin of influenza A virus produced by a baculovirus protein expression system.

J. Biochem. 147, 459-462 (2010)

26. Tadanobu Takahashi, Asako Hashimoto, Mami Maruyama, Hideharu Ishida, Makoto Kiso, Yoshihiro Kawaoka, Yasuo Suzuki, Takashi Suzuki. Identification of amino acid residues of influenza A virus H3 HA contributing to the recognition of molecular species of sialic acid.

FEBS Lett. 583, 3171-3174 (2009)

27. Repon Kumer Saha, Tadanobu Takahashi, and Takashi Suzuki. Glucosyl Hesperidin Prevents Influenza A Virus Replication In Vitro by Inhibition of Viral Sialidase.
Biol. Pharm. Bull. 32, 1188-1192 (2009)
28. Tadanobu Takahashi, Kouki Murakami, Momoe Nagakura, Hideyuki Kishita, Shinya Watanabe, Koichi Honke, Kiyoshi Ogura, Tadashi Tai, Kazunori Kawasaki, Daisei Miyamoto, Kazuya I. P. J. Hidari, Chao-Tan Guo, Yasuo Suzuki, and Takashi Suzuki. Sulfatide Is Required for Efficient Replication of Influenza A Virus.
J. Virol. 82, 5940-5950 (2008)
29. Tadanobu Takahashi, Yusuke Moriyama, Akira Ikari, Junko Sugatani, Takashi Suzuki, Masao Miwa. Surface localization of the nuclear receptor CAR in influenza A virus-infected cells.
Biochem. Biophys. Res. Commun. 368, 550-555 (2008)
30. Chao-Tan Guo, Tadanobu Takahashi, Kazuya I.-P. Jwa Hidari, Daisei Miyamoto, Takashi Suzuki, and Yasuo Suzuki. Edible bird's nest extraction inhibits the influenza virus infection.
Antiviral research 70, 140-146 (2006)
31. Toshihiro Kogure, Takashi Suzuki, Tadanobu Takahashi, Daisei Miyamoto, Kazuya I P. J. Hidari, Guo Chao-Tan, Toshihiro Ito, Yoshihiro Kawaoka, Yasuo Suzuki. Human trachea primary epithelial cells express both sialyl(α 2,3)Gal receptor for human parainfluenza virus type 1 and avian influenza viruses, and sialyl(α 2,6)Gal receptor for human influenza viruses.
Glycoconj. J. 23, 101-106 (2006)
32. Takashi Suzuki*, Tadanobu Takahashi*(*These authors contributed equally to this work.), Chao-Tan Guo, Kazuya I P. J. Hidari, Daisei Miyamoto, Hideo Goto, Yoshihiro Kawaoka, and Yasuo Suzuki. Sialidase activity of influenza A virus in an endocytic pathway enhances viral replication.
J. Virol. 79, 11705-11715 (2005)
33. Takashi Suzuki, Tadanobu Takahashi, Takehiko Saito, Chao-Tan Guo, Kazuya I.-P.

Jwa Hidari, Daisei Miyamoto and Yasuo Suzuki. Evolutional analysis of human influenza A virus N2 neuraminidase genes based on the transition of the low-pH stability of sialidase activity.

FEBS Lett. 557, 228-232 (2004)

34. Takashi Suzuki, Tadanobu Takahashi, Daisuke Nishinaka, Masanori Murakami, Satoshi Fujii, Kazuya I.-P. Jwa Hidari, Daisei Miyamoto, Yu-The Li and Yasuo Suzuki. Inhibition of influenza A virus sialidase activity by sulfatide.

FEBS Lett. 553, 355-359 (2003)

35. Tadanobu Takahashi, Takashi Suzuki, Kazuya I.-P. Jwa Hidari, Daisei Miyamoto, Yasuo Suzuki. A molecular mechanism for the low-pH stability of sialidase activity of influenza A virus N2 neuraminidases.

FEBS Lett. 543, 71-75 (2003)

36. Tadanobu Takahashi, Yasuo Suzuki, Daisuke Nishinaka, Nana Kawase, Yukiko Kobayashi, Kazuya I.-P. Jwa Hidari, Daisei Miyamoto, Chao-Tan Guo, Kennedy F. Shortridge, Takashi Suzuki. Duck and human pandemic influenza A viruses retain sialidase activity in low pH conditions.

J. Biochem. 130, 279-283 (2001)

Reviews:

1. Tadanobu Takahashi, Yuuki Kurebayashi, Tadamune Otsubo, Kiyoshi Ikeda, Akira Minami, Takahashi Suzuki. Tadanobu Takahashi. Fluorescence Imaging of Virus-infected Cells with a Sialidase Imaging Probe.
The Japan Society for Analytical Chemistry "Bunsekikagaku" 65 (12), 689-701 (2016)
2. Tadanobu Takahashi. Function analysis of glyco-molecules that bind with influenza virus.
The Japanese Society for Virology "Virus" 66 (1), 101-116 (2016)
3. Tomonari Tanaka, Tadanobu Takahashi, Takashi Suzuki. Protecting-Group-Free Synthesis of Glycopolymers and Their Binding Assay with Lectin and Influenza Virus.
Methods Mol. Biol. 1367, Springer Publishing, 39-48 (2016)
4. Tadanobu Takahashi. Properties of and a new technique for fluorescent detection of influenza virus sialidase (English and Japanese).
Trends Glycosci. Glycotechnol. 27 (158), E(J)49-E(J)60 (2015)
5. Tadanobu Takahashi and Takashi Suzuki. Low-pH Stability of Influenza A Virus Sialidase Contributing to Virus Replication and Pandemic.
Biol. Pharm. Bull. 38, 817-826 (2015)
6. Tadanobu Takahashi and Takashi Suzuki. Role of Sulfatide in Influenza A virus Replication.
Biol. Pharm. Bull. 38, 809-816 (2015)
7. Tadanobu Takahashi and Takashi Suzuki. Role of glycans in viral infection.
Sugar Chains, Springer Publishing, 71-93 (2015)
8. Tadanobu Takahashi. Development and application of a fluorescent imaging reagent

of viral sialidases for rapid and easy detection of virus and virus-infected cell (Japanese only).

Zikken Igaku 33 (13), 2114 (2015)

9. Tadanobu Takahashi. Study on development of new drug and epidemic prevention strategy of influenza virus (Japanese only).

Aging&Health 73, 38-41 (2015)

10. Tadanobu Takahashi. Function of Glycochains in Virus Infection (Japanese only).

YAKUGAKU ZASSHI 134 (8), 889-899 (2014)

11. Tadanobu Takahashi and Takashi Suzuki. Binding of influenza viruses to glycans.

Glycoscience: Biology and Medicine (Part IIIIV, Microbial Glycobiology and Infection, Glycobiology: Role of Glycans in Infections), Springer Publishing, 769-774 (2014)

12. Tadanobu Takahashi. Virological research based on glycobiology as the background (Japanese only).

Yakuzinippou (Published in October 2nd, 2013), pp 8 (2013)

13. Tadanobu Takahashi and Takashi Suzuki. Role of sulfatide in normal and pathological cells and tissues.

J. Lipid Res. 53, 1437-1450 (2012)

14. Tadanobu Takahashi and Takashi Suzuki. Function of membrane rafts in viral lifecycles and host cellular response.

Biochemistry Research International, vol. 2011, Article ID 245090, 23 pages (2011)

15. Tadanobu Takahashi and Takashi Suzuki. Promotion effect of influenza A virus replication by sulfatide.

Glycoforum,

<http://www.glycoforum.gr.jp/science/glycomicrobiology/GM05/GM05J.html>,

SEIKAGAKU CORPORATION (English and Japanese) (2010)

16. Tadanobu Takahashi and Takashi Suzuki. Role of sulfatide in virus infection and replication (English and Japanese).
TRENDS IN GLYCOSCIENCE AND GLYCOTECHNOLOGY (TIGG) 21 (121), 25
5-265 (2009)
17. Tadanobu Takahashi and Takashi Suzuki. Emergence of pandemic influenza viruses and low-pH stability of neuraminidase (Japanese only).
THE LUNG perspective 17 (4), 83-88 (2009)
18. Tadanobu Takahashi and Takashi Suzuki. Role of membrane rafts in viral infection.
The Open Dermatology Journal 3, 165-181 (2009)
19. Takashi Suzuki, Tadanobu Takahashi, Yasuo Suzuki. Role of sulfatide on influenza A virus replication (Japanese only).
PROTEIN NUCLEIC ACID AND ENZYME 53 (12), 1676-1682 (2008)
20. Takashi Suzuki, Tadanobu Takahashi, Kazuya I.-P. Jwa Hidari. Role of spike glycoproteins and host sialoglycoconjugates in the replication of influenza viruses (Japanese only).
Zikkenigaku 25 (7), 30-36 (2007)
21. Tadanobu Takahashi, Yasuo Suzuki, Takashi Suzuki. Role of influenza virus sialidase (Japanese only).
Seikagaku 78 (5), The Japanese Biochemical Society, 409-412 (2006)
22. Takashi Suzuki, Tadanobu Takahashi, Yasuo Suzuki. Structure and function of pandemic influenza type A virus neuraminidase (Japanese only).
Idenshi Igaku Mook 3, Medical do, 261-266 (2005)

Prizes:

1999. 3. 1st Iwasaki Prize (Graduated from School of Pharmaceutical Sciences, University of Shizuoka, Japan, with top honors)
2005. 7. 8th Poster Prize, US/Japan Glyco 2004 (Honolulu), The Japanese Society of Carbohydrate Research (Nihon tousei gakkai)
“Molecular mechanism and evolutionary analysis of human influenza A virus N2 neuraminidase genes based on the transition of the low-pH stability of sialidase activity.”
2010. 3. 2009 Young Scientist Encouraging Prize, Nagoya Strongpoint for Glycoscience (Tousakagaku Nagoya-kyoten)
“Analysis of virus infection mechanism associated with sulfated glycolipid sulfatide.”
2013. 7. 2013 Academic Encouraging Prize, Tokai branch of the Pharmaceutical Society of Japan (Nihon yakugakukai Tokai-shibu)
“Function analysis of glycochain on virus infection.”
2014. 8. 2014 Academic Encouraging Prize, The Japanese Society of Carbohydrate Research (Nihon tousei gakkai)
“Function analysis of viral glycoproteins and glycochains on the respiratory virus infection.”
2014. 11. 2014 Prize for Aging and Health Sciences, Japan Foundation for Aging and Health (Chouzyukagaku shinkou zaidan)
“Development of techniques and researches of glycoscience for novel drugs and epidemic preventions of influenza virus.”
2015. 2. 3rd TOBIRA Encouraging Prize, Tokyo Biomarker Innovation Research Association (TOBIRA) (Tokyo biomarker innovation gizyutsukenkyukumiai)

“Development and application for easy and rapid detection reagents of virus and virus-infected cells using viral enzyme.”

2015. 3. 1st President’s Awards, University of Shizuoka
2015. 11. 2015 Sugiura Award, The Japanese Society for Virology (Nihon uirusu gakkai)
“Functional analysis of glyco-molecules that bind with influenza virus”
2016. 3. 2nd President’s Awards, University of Shizuoka
2016. 10. Award for Researchers on Chemical and Biological Materials, Japan Bioindustry Association
“A novel fluorescent probe for live cell imaging of viral sialidases”