

TAKANOBU TAGAWA, Ph.D.

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EDUCATION

- Doctoral degree (Dr. rer. nat, Ph.D. equivalent) in Biology 2011-2016
Ludwig-Maximilians-University, Munich, Germany
- Master of Science in Biology 2009-2011
University of Tokyo Graduate School, Tokyo, Japan
- Bachelor of Science 2005-2009
University of Tokyo, Department of Biophysics and Biochemistry (Major)
Undergraduate Program for Bioinformatics and Systems Biology (Minor)

RESEARCH EXPERIENCE

- Postdoctoral fellow,* 2017-present
Laboratory of Joseph Ziegelbauer, Ph.D.
HIV and AIDS Malignancy Branch, National Cancer Institute, USA
• I study the production and functions of circular RNAs during infection with Kaposi's sarcoma virus (KSHV). I discovered viral circRNAs as well as viral regulation of human circRNAs. I also perform RNA-Seq and single-cell RNA-Seq analysis of KSHV-positive clinical samples.
- Doctoral Student,* 2011- 2017
Laboratory of Wolfgang Hammerschmidt, Prof. Dr.
Research Unit Gene Vectors, Helmholtz Center Munich, Germany
• Investigation of immune evasive functions of Epstein-Barr virus (EBV) microRNAs in human primary B cells. Through RNA-Seq analysis and B/T cell immune assays, I found multiple viral miRNAs that control differentiation and recognition of anti-viral T cells. The degree was awarded from Ludwig-Maximilians-University.
- Master Student,* 2009 - 2011
Laboratory of Dr. Hideo Iba, Ph.D.
The Institution of Medical Science, University of Tokyo, Japan
• Identification of human miRNAs that target the carcinoma marker and transcription factor CDX2. I also contributed to the development of a miRNA inhibitor, S-TuD (synthetic Tough Decoy), now available from Sigma-Aldrich.
- Research Assistant,* 2007 - 2009
Laboratory of Yuichi Iino, Ph.D.
Molecular Genetics Research Laboratory, Department of Biophysics and Biochemistry
University of Tokyo, Japan
• Behavioral analysis of *C. elegans* salt-taxis using in silico and genetic approaches.

FUNDING

Wellcome Trust Career Development Awards 2024-2029
„Uncovering the control of pathogenic herpesviruses by human and viral circular RNAs“
For a tenure-track principle investigator position at the University of Edinburgh, Scotland

AWARDS AND FELLOWSHIPS

Gordon Research Seminar poster award 2023
Gordon Research Seminar: Viruses and cells

25th International KSHV conference travel award 2022
25th International KSHV conference

The Research Fellowship for Japanese Biomedical and Behavioral Researchers 2021 - 2022
Japan Society for the Promotion of Science, Japan

Norman P. Salzman Poster Award in Virology 2019
Foundation for the National Institutes of Health, USA

HIV Think Tank Oral Presentation Travel Award 2018, 2019
Center for Cancer Research, National Cancer Institute, USA

Funding for my doctoral research 2013 - 2016
Collaborative research centre 1054 - Control and Plasticity of Cell-Fate Decisions in the Immune System, Germany

Scholarship (stipend for my doctoral research) 2012 – 2015
German Academic Exchange Service (DAAD), Germany

PUBLICATIONS

1. Dremel, S.E. *, **T. Tagawa***, V.N. Koparde, J.H. Arbuckle, T.M. Kristie, L.T. Krug, and J.M. Ziegelbauer. 2023. Interferon induced circRNAs escape herpesvirus host shutoff and suppress lytic infection. *bioRxiv*. doi:10.1101/2023.09.07.556698.
(*: equal author contribution)
2. Ramaswami, R., **T. Tagawa**, G. Mahesh, A. Serquina, V. Koparde, K. Lurain, S. Dremel, X. Li, A. Mungale, A. Beran, Z.W. Ohler, L. Bassel, A. Warner, R. Mangusan, A. Widell, I. Ekwe, L.T. Krug, T.S. Uldrick, R. Yarchoan, and J.M. Ziegelbauer. In press. Transcriptional landscape of Kaposi sarcoma tumors identifies unique immunologic signatures and key determinants of angiogenesis. *J. Transl. Med.* doi: 10.1101/2022.03.18.484923.
3. **Tagawa T**, Oh D, Dremel S, Mahesh G, Koparde VN, Duncan G, Andresson T, and Ziegelbauer JM. 2023. A virus-induced circular RNA maintains latent infection of Kaposi sarcoma herpesvirus. *Proc Natl Acad Sci USA*. doi: 10.1073/pnas.2212864120.
4. Albanese, M.*, **T. Tagawa***, and W. Hammerschmidt. 2022. Strategies of Epstein-Barr virus to evade innate antiviral immunity of its human host. *Frontiers in Microbiology*. doi: 10.3389/fmicb.2022.955603.

(*: equal author contribution)

5. Albanese, M., Y. F. A. Chen, C. Hüls, K. Gärtner, **T. Tagawa**, M. Mejias-Perez, E., O. T. Keppler, C. Göbel, R. Zeidler, M. Shein, L. Martin, A. K. Schütz, & W. Hammerschmidt. 2021. MicroRNAs are minor constituents of extracellular vesicles that are rarely delivered to target cells, **PLoS Genetics** doi: 10.1371/journal.pgen.1009951
6. Serquiña, A. K. P., **T. Tagawa**, D. Oh, Mahesh & J.M. Ziegelbauer. 2021. M. 25-Hydroxycholesterol Inhibits Kaposi's Sarcoma Herpesvirus and Epstein-Barr Virus Infections and Activates Inflammatory Cytokine Responses. **Mbio** 12, e02907-21 doi: /10.1128/mBio.02907-21.
7. **Tagawa T.**, D. Oh, J. Santos, S. Dremel, G. Mahesh, T.S. Uldrick, R. Yarchoan, V.N. Kopardé, & J.M. Ziegelbauer. 2021. Characterizing expression and regulation of gamma-herpesviral circular RNAs. **Frontiers in Microbiology** doi: 10.3389/fmicb.2021.670542
8. Bouvet, M., S. Voigt, **T. Tagawa**, M. Albanese, Y.A. Chen, Y. Chen, DN. Fachko, D. Pich, C. Göbel, RL. Skalsky, & W. Hammerschmidt. 2021. Multiple Viral microRNAs Regulate Interferon Release and Signaling Early during Infection with Epstein-Barr Virus. **Mbio** 12, doi:10.1128/mbio.03440-20.
9. **Tagawa, T.**, Kopardé, V. N. & J. M. Ziegelbauer. 2021. Identifying and characterizing virus-encoded circular RNAs. **Methods** doi:10.1016/j.ymeth.2021.03.004.
10. Ideta, Y., **T. Tagawa**, Y. Hayashi, J. Baba, K. Takahashi, K. Mitsudo, & K. Sakurai. 2021. Transcriptomic Profiling Predicts Multiple Pathways and Molecules Associated with the Metastatic Phenotype of Oral Cancer Cells. **Cancer Genomics & Proteomics** 18, 17–27. doi:10.21873/cgp.20238.
11. **Tagawa, T.**, A. Serquiña, I. Kook, & J.M. Ziegelbauer. Viral non-coding RNAs: Stealth strategies in the tug-of-war between humans and herpesviruses. **Seminars in cell & developmental biology** 13, 607 (2020). doi:10.1016/j.semcdb.2020.06.015.
12. Schaeffner, M., P. Mrozek-Gorska, A. Buschle, A. Woellmer, **T. Tagawa**, F.M. Cernilogar, G. Schotta, N. Krietenstein, C. Lieleg, P. Korber, and W. Hammerschmidt. 2019. BZLF1 interacts with chromatin remodelers promoting escape from latent infections with EBV. **Life Sci Alliance**. 2:e201800108. doi:10.26508/lsa.201800108.
13. Davis, D.A., P. Shrestha, A.I. Aisabor, A. Stream, V. Galli, C.A. Pise-Masison, **T. Tagawa**, J.M. Ziegelbauer, G. Franchini, and R. Yarchoan. 2019. Pomalidomide increases immune surface marker expression and immune recognition of oncovirus-infected cells. **Oncolmmunology**. 8:e1546544. doi:10.1080/2162402X.2018.1546544.
14. **Tagawa, T.**, S. Gao, V.N. Koparde, M. Gonzalez, J.L. Spouge, A.P. Serquiña, K. Lurain, R. Ramaswami, T.S. Uldrick, R. Yarchoan, and J.M. Ziegelbauer. 2018. Discovery of Kaposi's sarcoma herpesvirus-encoded circular RNAs and a human antiviral circular RNA. **Proc Natl Acad Sci USA**. 115:12805–12810. doi:10.1073/pnas.1816183115. **[F1000 Primer Recommended]**
15. Danisch, S., C. Slabik, A. Cornelius, M. Albanese, **T. Tagawa**, Y.-F.A. Chen, N. Krönke, B. Eiz-Vesper, S. Lienenklaus, A. Bleich, S.J. Theobald, A. Schneider, A. Ganser, C. von Kaisenberg, R. Zeidler, W. Hammerschmidt, F. Feuerhake, and R. Stripecke. 2018. Spatiotemporally Skewed Activation of Programmed Cell Death Receptor 1-Positive T Cells after Epstein-Barr Virus Infection and Tumor Development in Long-Term Fully

Humanized Mice. *The American Journal of Pathology*. doi:10.1016/j.ajpath.2018.11.014.

16. Albanese, M.*, **T. Tagawa***, A. Buschle, and W. Hammerschmidt. 2017. MicroRNAs of Epstein-Barr Virus Control Innate and Adaptive Antiviral Immunity. *Journal of Virology*. 91:e01667–16. doi:10.1128/JVI.01667-16.

(*: equal author contribution)

17. Albanese, M*., **T. Tagawa***, M. Bouvet, L. Maliqi, D. Lutter, J. Hoser, M. Hastreiter, M. Hayes, B. Sugden, L. Martin, A. Moosmann, and W. Hammerschmidt. 2016. Epstein-Barr virus microRNAs reduce immune surveillance by virus-specific CD8+ T cells. *Proc. Natl. Acad. Sci. U.S.A.* 113:E6467–E6475. doi:10.1073/pnas.1605884113.

(*: equal author contribution) **[F1000 Primer Recommended]**

18. **Tagawa, T.***, M. Albanese*, M. Bouvet, A. Moosmann, J. Mautner, V. Heissmeyer, C. Zielinski, D. Lutter, J. Hoser, M. Hastreiter, M. Hayes, B. Sugden, and W. Hammerschmidt. 2016. Epstein-Barr viral miRNAs inhibit antiviral CD4+ T cell responses targeting IL-12 and peptide processing. *Journal of Experimental Medicine*. 213:2065–2080. doi:10.1084/jem.20160248. (*: equal author contribution) **[F1000 Primer Recommended]**

19. Vereide, D.T., E. Seto, Y.-F. Chiu, M. Hayes, **T. Tagawa**, A. Grundhoff, W. Hammerschmidt, and B. Sugden. 2013. Epstein-Barr virus maintains lymphomas via its miRNAs. *Oncogene*. 33:1258–1264. doi: 10.1038/onc.2013.71.

20. Yoshida, K., T. Hirotsu, **T. Tagawa**, S. Oda, T. Wakabayashi, Y. Iino, and T. Ishihara. 2012. Odour concentration-dependent olfactory preference change in *C. elegans*. *Nature Communications*. 3:739. doi:10.1038/ncomms1750.

21. **Tagawa, T.**, T. Haraguchi, H. Hiramatsu, K. Kobayashi, K. Sakurai, K.-I. Inada, and H. Iba. 2012. Multiple microRNAs induced by Cdx1 suppress *Cdx2* in human colorectal tumour cells. *Biochemistry Journal*. 447:449–455. doi:10.1042/BJ20120434.

22. Haraguchi, T., H. Nakano, **T. Tagawa**, T. Ohki, Y. Ueno, T. Yoshida, and H. Iba. 2012. A potent 2'-O-methylated RNA-based microRNA inhibitor with unique secondary structures. *Nucleic Acids Research*. 40:e58–e58. doi:10.1093/nar/gkr1317.

23. Sakurai, K., C. Furukawa, T. Haraguchi, K.I. Inada, K. Shiogama, **T. Tagawa**, S. Fujita, Y. Ueno, A. Ogata, M. Ito, Y. Tsutsumi, and H. Iba. 2011. MicroRNAs miR-199a-5p and -3p target the Brm subunit of SWI/SNF to generate a double-negative feedback loop in a variety of human cancers. *Cancer Research*. 71:1680–1689. doi:10.1158/0008-5472.CAN-10-2345.

CONFERENCE PRESENTATIONS

T. Tagawa[†] and JM. Ziegelbauer. A circular RNA induced by Kaposi sarcoma herpesvirus infection maintains viral latency. Viruses and Cells Gordon Research Conference, May 2023, Poster presentation

T. Tagawa and JM. Ziegelbauer. A circular RNA induced by Kaposi sarcoma herpesvirus infection maintains viral latency. CCR RNA Symposium, April 2023, Poster presentation

T. Tagawa and JM. Ziegelbauer. Exposing stealth strategies: non-coding RNAs during oncogenic herpesvirus infection. JSPS-NIH symposium, March 2023, Invited talk

T. Tagawa[†] and JM. Ziegelbauer. Kaposi's sarcoma herpesvirus-induced circular RNAs control infection and cell growth. 25th International KSHV conference, July 2022, Oral presentation

T. Tagawa[†] and JM. Ziegelbauer. Kaposi's sarcoma herpesvirus-induced circular RNAs control infection and cell growth. 46th Annual International Herpesvirus Workshop, June 2022, Oral presentation

T. Tagawa[†] and JM. Ziegelbauer. Kaposi's sarcoma herpesvirus-induced circular RNAs control infection and cell growth. Annual Herpesvirus: Pathogenesis and Cancer Symposium, June 2022, Oral presentation

T. Tagawa[†], D. Oh, S. Dremel, TS. Uldrick, R. Yarchoan, and JM. Ziegelbauer. Characterizing Expression and Regulation of Human and Viral Circular RNAs, 23rd Int'l Workshop on Kaposi's Sarcoma Herpesvirus & Related Agents, June 2021, Poster presentation

T. Tagawa[†], D. Oh, S. Dremel, TS. Uldrick, R. Yarchoan, and JM. Ziegelbauer. Characterizing Expression and Regulation of Human and Viral Circular RNAs, CCR RNA Symposium, April 2021, Poster presentation

T. Tagawa[†] and JM. Ziegelbauer. Functional Analysis of Human and Viral Circular RNAs During Kaposi's Sarcoma Herpesvirus Infection, 17th International Conference on Malignancies in HIV/AIDS, October 2019, Oral presentation

T. Tagawa[†] and JM. Ziegelbauer. Understanding the KSHV miRNA-Target Network, 22nd International Workshop on Kaposi's Sarcoma Herpesvirus and Related Agents, June 2019, Oral presentation

T. Tagawa[†], S. Gao, VN. Koparde, MW. Gonzakez, JL. Spouge, A. Serquina, K. Lurain, R. Ramaswami, TS. Uldrick, R. Yarchoan, and JM. Ziegelbauer. Human and Viral Circular RNAs during infection, CCR RNA Symposium, April 2019, Poster presentation

T. Tagawa[†], S. Gao, VN. Koparde, MW. Gonzakez, JL. Spouge, A. Serquina, K. Lurain, R. Ramaswami, TS. Uldrick, R. Yarchoan, and JM. Ziegelbauer. Human and Viral Circular RNAs during infection, RNA Biology Workshop, Center for Cancer Research, November 2018, Oral presentation

T. Tagawa[†], S. Gao, VN. Koparde, MW. Gonzakez, JL. Spouge, A. Serquina, K. Lurain, R. Ramaswami, TS. Uldrick, R. Yarchoan, and JM. Ziegelbauer. Human and Viral Circular RNAs during infection, RNA Club, National Institute of Health, November 2018, Oral presentation

T. Tagawa[†] and JM. Ziegelbauer. Human and Viral Circular RNAs during infection, International EBV and KSHV symposium, Madison, USA, August 2018, Oral presentation

Tagawa T.[†], M. Albanese, M. Bouvet, D. Lutter, J. Hoser, M. Hastreiter, and W. Hammerschmidt, Epstein- Barr viral miRNAs inhibit antiviral CD4+ T cell responses early in infection, International EBV symposium, Zurich, Switzerland, August 2016, Oral presentation

Tagawa T.[†], C. Hurukawa, T. Haraguchi, H. Iba, miRNAs induced by CDX1 suppresses CDX2 expression, Biochemistry and Molecular Biology 2010, Kobe, Japan, September 2010, Poster session

Yoshida K.[†], T. Hirotsu, **T. Tagawa**, S. Oda, Y. Iino, and T. Ishihara, Neural and behavioral mechanisms of response to an odorant depending on its concentration, 4th East Asia C. elegans Meeting, Tokyo, July 2010, Poster session

Yoshida K.[†], T. Hirotsu, **T. Tagawa**, S. Oda, Y. Iino, and T. Ishihara, Neural and behavioral mechanisms of response to an odorant depending on its concentration, CeNeuro2010, Madison, June 2010, Poster session

Iino Y.[†], M. Tomioka, K. Adachi, K. Yoshida, and **T. Tagawa**, Molecular and Cellular Mechanisms of Chemotaxis and Chemotaxis Learning in *C. elegans*, 80th Annual meeting of the Genetics Society of Japan, Nagoya, September 2008, Poster session

Iino Y.[†], K. Yoshida, and **T. Tagawa**, Behavioral Strategy for Salt Chemotaxis and Underlying Neurons, CeNeuro2008, Madison, August 2008, Poster session

([†]: presenter)

TEACHING AND MENTORING

<i>Journal club leader</i>	2022
Summer interns National Institutes of Health, USA	
<i>Research mentor,</i>	2019, 2021
Daniel Oh (Summer intern and post-bac), National Cancer Institute, USA Current: PhD candidate, Rockefeller University	
<i>Research mentor,</i>	2019-2020
Jerico Santos, MD (PhD student), National Cancer Institute, USA Current: PhD candidate, University of Philippines, Philippines	
<i>Research mentor,</i>	2016
Liridona Maliqi (Master student), Helmholtz Center Munich, Germany Current: PhD candidate, University of Zürich, Switzerland	
<i>Teaching Assistant,</i>	2009
Bioinformatics workshop, University of Tokyo, Japan	