

**Rio Sugimura, M.D., Ph.D.**

**Rio Sugimura, M.D., Ph.D.**  
**Principal Investigator, Assistant Professor, The University of Hong Kong**  
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**ORCID: 0000-0001-5701-3628**

**Education:**

2012	PhD	Stem Cell Biology, Stowers Institute for Medical Research, Kansas City, MO Thesis title (published in <i>Cell</i> ): Investigating the functional roles of Flamingo and Frizzled8 in hematopoietic stem cells.
2008	MD	Osaka University

**Research Experience:**

2021-	PI, The Centre for Translational Stem Cell Biology	<ul style="list-style-type: none"><li>• cancer immunotherapy</li></ul>
2020-	PI, Assistant Professor, University of Hong Kong, HK	<ul style="list-style-type: none"><li>• cancer immunotherapy</li></ul>
2020	Visiting Professor, University of Pavia, Italy	<ul style="list-style-type: none"><li>• cancer immunotherapy</li></ul>
2018-2020	Research Scientist, Kyoto University, Japan	<ul style="list-style-type: none"><li>• analysis of signaling pathways in human developmental hematopoiesis</li></ul>
2014-2018	Postdoctoral Fellow, Boston Children's Hospital	<ul style="list-style-type: none"><li>• induction of hematopoietic stem cells from human pluripotent stem cells</li></ul>
2012-2014	Postgraduate Researcher, Stowers Institute for Medical Research	<ul style="list-style-type: none"><li>• analysis of morphogens in hematopoietic stem cell maintenance</li></ul>

**Editorial Board:**

2024-	eLIFE
2023-	Cell & Bioscience
2022-	Frontiers in Immunology
2022-	Frontiers in Cell and Developmental Biology
2022-	Scientific Reports
2021-	Differentiation
2021-	Cellular Reprogramming

**Reviewer:**

2024-	Cell
2024-	STAR Protocols
2022-	Journal of Immunotherapy for Cancer
2022-	Frontiers in Immunology
2021-	Frontiers in Cell and Developmental Biology
2021-	Developmental Cell
2021-	Development
2021-	eLIFE

**Community Service and Professional Membership:**

2024-	Organizer, HKU BME mixer
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## Rio Sugimura, M.D., Ph.D.

2024-	Crowed lead, Immunology section, ASAPbio
2023-2024	Committee member, Early Career Immunology
2023-	Supervisor, iGEM HKU team
2023-	Judge, iGEM Grand Jamboree, Paris
2023-	Organizer, e-Seminar series of New PI Cell & Dev Bio Community
2023-2024	Communities Committee, NAVBO Northern America Vascular Biology Organization
2023-	Award Review Committee, SITC Society for Immunotherapy of Cancer
2023-	Abstract Reviewer, SITC Society for Immunotherapy of Cancer
2023-	Abstract Reviewer, ISSCR International Society of Stem Cell Research
2022-	Council member, FIMSA Federation of Immunological Societies of Asia-Oceania
2022	Organizing committee, New PI Cell & Dev Bio Symposium, Denmark
2021-	Organizer, Seminar series of Centre for Translational Stem Cell Biology
2021-	Organizer, Cancer immunology supergroup meetings, HKUMed
2021-2023	eLife Ambassador
2021-	Member, HK Society of Immunology
2021-	Silver Most Active Member, SITC Society for Immunotherapy of Cancer
2021-	Member, AAI American Association of Immunologists
2021-	Member, NAVBO Northern America Vascular Biology Organization

### Ongoing Funding (USD \$):

2025-2028	ITF TCFS, \$68,000
2024-2027	Seed CRF, \$128,000
2024-2025	Longevity Catalysis Award, National Academy of Medicine, \$50,000
2023-2026	CRF, Co-I, \$920,000
2023-2026	Seed CRF, \$123,000
2023-2025	RGC GRF, \$155,000
2023-2025	Gilead Liver Disease Program, \$130,000
2022-2024	RGC ECS, \$155,000
2021-2027	Seed Funding, \$386,000
2021-2025	InnoHK Centre for Translational Stem Cell Biology, \$1,610,000

### Past Funding (USD \$):

2021-2022	Platform for Technology Funding, \$129,000
2020-2020	Uehara Foundation, \$18,000
2019-2020	KAKENHI Early Career Grant, Japanese Government, \$42,000
2019-2020	Takeda Science Foundation, \$18,000
2019-2020	CiRA Challenge Grant, \$25,000
2020	Research Scholarship of the University of Pavia, \$10,000
2019-2020	iPS Academia Japan Fellowship, \$18,000
2018-2020	Initiative for Excellent Young Researchers, \$150,000
2018-2019	SMRF Fellowship, \$8,000
2019	Kanehara Memorial Foundation, \$2,000
2016-2018	American Society of Hematology Scholar Award, \$100,000
2015-2016	Uehara Memorial Foundation CiRA, \$10,000

### Awards:

2024	Outstanding Research Output Award by Li Ka Shing Faculty of Medicine
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## **Rio Sugimura, M.D., Ph.D.**

2024	HKU-SZ Hospital Rare Disease Fund
2023	Longevity Catalyst Award, National Academy of Medicine
2023	HKU-HKSTP DeepTech100
2022	Young Investigator Competition, Cells Tissues Organs
2019	Kanehara Memorial Foundation
2013	Genius Prize, Young Hematologist Meeting in Japan
2013	Abstract Achievement Award, American Society of Hematology
2009	March of Dimes Scholarship
2007	Kishimoto Memorial Scholarship

### **Invited talks:**

2024	ICBME, Singapore
2024	The Harvey Course of Stem Cell & Medicine, University of Pavia, Italy
2024	Keystone Meeting, Innate Immunity, Canada
2024	UC Santa Cruz, USA
2024	UC San Francisco, USA
2024	UPMC, USA
2024	Gordon Research Conference, Immunoengineering, Italy
2023	Shenzhen Bay Lab, China
2023	BioCon Asia, Singapore
2023	National University of Singapore, Singapore
2023	Crick-HKU Symposium, UK
2023	EMBL Heidelberg, Germany
2023	CMMC-CECAD, Germany
2023	CIEMAT, Spain
2023	Gordon Research Conference, Phagocytes, USA
2023	Cambridge – CTSCB Symposium, Hong Kong
2023	HK Immunology Society Symposium, Hong Kong
2023	Li Ka Shing Faculty of Medicine Symposium, Hong Kong
2022	HCA Asia, Thailand
2022	Liver Research Series, University of Pittsburgh, USA
2022	Biomedical Engineering Series, University of North Carolina, USA
2022	New PI Cell & Developmental Biology Community Conference, Denmark
2022	Alessandro Volta Lecture, University of Pavia, Italy
2022	HK Developmental Biology Symposium, Hong Kong

### **Patents:**

1. Practitioner's Docket Number 701039-087152-PCT. Publication number: 20190119643. HEMATOPOIETIC STEM AND PROGENITOR CELLS DERIVED FROM HEMOGENIC ENDOTHELIAL CELLS.
2. US Provisional Application No. 63/550,683 filed on 7 Feb 2024 Title: VASCULAR ORGANOID AND VASCULAR IMMUNE ORGANOID FROM HUMAN EXPANDED POTENTIAL STEM CELLS. TTO/R: IP01348

### **Publications:**

**Citations = 1,937. h index = 12 (Google Scholar, October 14, 2024),**

## Rio Sugimura, M.D., Ph.D.

1. Hongfei Chen, Yishu Bao, Xiaojing Li, Fangke Chen, **Ryohichi Sugimura**, Xiangze Zeng, Jiang Xia (2024) Cell Surface Engineering by Phase-Separated Coacervates for Antibody Display and Targeted Cancer Cell Therapy. **Angewandte Chemie**
2. Xiaohan Feng, Zehaoyu Wu, Lily Kwan Wai Cheng, Yang Xiang, **Ryohichi Sugimura**, Xuyan Lin, Angela Ruohao Wu (2024) Reversibly-bonded microfluidic devices for stable cell culture and rapid, gentle cell extraction. **Lab on a Chip**
3. Chiu Wang Chau, Alex To, Rex K.H. Au-Yeung, Kaiming Tang, Yang Xiang, Degong Ruan, Lanlan Zhang, Hera Wong, Shihui Zhang, Man Ting Au, Seok Chung, Euijeong Song, Dong-Hee Choi, Pentao Liu, Shuofeng Yuan, Chunyi Wen, **Ryohichi Sugimura** (2024) SARS-CoV-2 infection activates inflammatory macrophages in vascular immune organoids. **Scientific Reports**
4. Wan, X., Xiao, J., Tam, S., Cai, M., **Sugimura, R.**, Wang, Y., Wan, X., Lin, Z., Wu, A., Yang, C. (2023) Integrating spatial and single-cell transcriptomics data using deep generative models with SpatialScope. **Nature Communications**
5. Cao, H., Xiang, Y., Zhang, S., Chao, Y., Guo, J., Ho, J.W.K., Huang, Y., Liu, P., **Sugimura, R.** (2023) PD-L1 regulates inflammatory programs of macrophages from human pluripotent stem cells. **Life Science Alliance**. DOI: 10.26508/lsa.202302461
6. Kitagawa, Y., Ikenaka, A., **Sugimura, R.**, Niwa, A., Saito, M. (2023) ZEB2 and MEIS1 independently contribute to hematopoiesis via early hematopoietic enhancer activation. **iScience**
7. Chao, Y., Xiang, Y., Xiao, J., Zhang, S., Zheng, W., Wan, X., Li, Z., Gao, M., Wang, G., Chen, Z., Ebrahimkhani, M., Yang, C., Wu, A. R., Liu, P., Huang, Y., **Sugimura R.** (2023) Organoid-based single-cell spatiotemporal gene expression landscape of human embryonic development and hematopoiesis. **Signal Transduction and Targeted Therapy**
8. Poon YC, Wang C, Hang S, Liu P, **Sugimura R.** (2023) Generation of Natural Killer Cells from Human Expanded Potential Stem Cells. **Journal of Visualized Experiments**. DOI:10.3791/64608
9. Wang Y, Ma B, Liu X, Gao G, Che Z, Fan M, Meng S, Zhao X, **Sugimura R**, Cao H, Zhou Z, Xie J, Lin C, Luo Z. (2022) ZFP281-BRCA2 prevents R-loop accumulation during DNA replication. **Nature Communications**. 13.
10. **Sugimura, R.**, Ohta, R., Mori, C., Li, A., Mano, T., Sano, E., Kosugi, K., Nakahata, T., Niwa, A., Saito, M., Torisawa, Y. (2020) Biomimetic Aorta-Gonad-Mesonephros on-a-Chip to Study Human Developmental Hematopoiesis. **Biomedical Microfluidics**. 22.
11. Ohta, R\*, **Sugimura, R\***, Niwa, A., Saito, M. (2019) Hemogenic Endothelium Differentiation from Human Pluripotent Stem Cells in A Feeder- and Xeno-Free Defined Condition. **Journal of Visualized Experiments**. \*equal contribution
12. **Sugimura, R.**, Jha, D., Han, A., Soria-Valles, C., da Rocha, E., Lu, Y., Goettel, J., Serrao, E., Rowe, R., Malleshiah, M., Wong, I., Sousa, P., Zhu, T., Ditadi, A., Keller, G., Engelman, A., Snapper, S., Doulatov, S., Daley, G. (2017) Hematopoietic Stem and Progenitor Cells from Human Pluripotent Stem Cells. **Nature**. 545, 432-438.
13. Venkatraman, A., He, X.C., Thorvaldsen, J., **Sugimura, R.**, Perry, P., Tao, F., Zhao, M., Christenson, M., Sanchez, R., Yu, J., Peng, L., Haug, J., Paulson, A., Li, H., Zhong, X., Clemens, T., Bartlomei, M., Li, L. (2013). Maternal-imprinting at H19-Igf2 locus maintains adult hematopoietic stem cell quiescence. **Nature**. 500, 345-349.

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14. **Sugimura, R.**, He, X.C., Venkatraman, A., Arai, F., Box, A., Semerad, C., Haug, J., Peng, L., Zhong, X., Suda, T., Li, L. (2012). Noncanonical Wnt signaling maintains hematopoietic stem cells in the niche. **Cell**. 150, 351-365.
15. Perry, J.M., He, X.C., **Sugimura, R.**, Grindley, J.C., Haug, J.S., Ding, S., and Li, L. (2011). Cooperation between both Wnt/ $\beta$ -catenin and PTEN/PI3K/Akt signaling promotes primitive hematopoietic stem cell self-renewal and expansion. **Genes & development**. 25, 1928-1942.

## Preprints:

1. Chun Lai CHAN, Alex TO, Shihui ZHANG, Jason Wing Hon WONG, Yuanhua HUANG, Yiming CHAO, **Ryohichi SUGIMURA**. (2024). Lipidic and senescent macrophages predict progression and response to combinatorial immunotherapy in triple-negative breast cancer **Biorxiv**. doi.org/10.1101/2024.06.24.600550
2. Xue, Y., Chao, Y., Lin, X., Huang, Y., Ho, J.W.K., **Sugimura, R.** (2023) Single-cell mitochondrial variant enrichment resolved clonal tracking and spatial architecture in human embryonic hematopoiesis. **Biorxiv**. doi.org/10.1101/2023.09.18.558215

## Reviews:

1. Wang TK, **Sugimura R** (2024) Breakthroughs in synthetic controlling strategies for precision in CAR-T therapy. **Progress in Molecular Biology and Translational Science**.
2. Luo EY, **Sugimura R** (2024) Taming microglia: the promise of engineered microglia in treating neurological diseases. **Journal of Neuroinflammation**.
3. Chen Z, **Sugimura R**, Zhang YS, Ruan C, Wen C. (2024) Organoids in concert: engineering in vitro models toward enhanced fidelity. **Aggregate**. doi/10.1002/agt2.478
4. Chan CL, **Sugimura R**. (2023) Unveiling the immune system ageing in single-cell resolution. **Journal of Leukocyte Biology**. doi.org/10.1093/jleuko/qiad136
5. Wong H., **Sugimura R**. (2023) Immune-epigenetic crosstalk in haematological malignancies. **Front. Cell Dev. Biol.** 11
6. Wang C. C., **Sugimura R**. (2023) Organoids in COVID-19: Can we break the glass ceiling? **Journal of Leukocyte Biology**. https://doi.org/10.1093/jleuko/qiad098
7. Lin, X., Sun, Y., Dong, X., Liu, Z., **Sugimura, R.\***, Xie, G.\* (2023) iPSC-derived CAR-NK cells for cancer immunotherapy. **Biomed Pharmacother**. Jul 3;165:115123  
**\* Co-corresponding**
8. Ma Z., **Sugimura R.\***, Lui K.O.\* (2023) The role of m6A mRNA modification in normal and malignant hematopoiesis. **Journal of Leukocyte Biology**. doi.org/10.1093/jleuko/qiad061  
**\* Co-corresponding**
9. Wang Y, **Sugimura R**. (2023). Ex vivo expansion of hematopoietic stem cells. **Exp. Cell Res**. doi: 10.1016/j.yexcr.2023.113599.
10. Yip S, Wang N, **Sugimura R**. (2023). Give them vasculature and immune cells – how to fill the gap of organoids. **Cells Tissues Organs**. doi: 10.1159/000529431.  
**Awarded Young Investigator Competition**
11. Hang S., Wang N., **Sugimura R**. (2023). T, NK, then macrophages: Recent advances and challenges in adaptive immunotherapy from human pluripotent stem cells. **Differentiation**. doi: 10.1016/j.diff.2023.01.001
12. Poon YC, **Sugimura R**. (2022). The prospect of genetic engineering Natural Killers cells for cancer immunotherapy. **Biology Open**.

13. Cao H, Gao S, Jogani R, **Sugimura R.** (2022). The tumor microenvironment reprograms immune cells. **Cellular Reprogramming.** Oct 26. doi: 10.1089/cell.2022.0047
14. Wang CY, Ting Cheung SP, **Sugimura R.** (2022). Combating challenges in CAR-T cells with engineering immunology. **Front. Cell Dev. Biol.** Oct 10;10:969020
15. Wang Chau C, **Sugimura R.** (2022). COVID-19: Locked in a pro-inflammatory state. **eLife.** 11
16. **Sugimura R,** Chao Y. (2022). Deciphering Innate Immune Cell-Tumor Microenvironment Crosstalk at a Single-Cell Level. **Front. Cell Dev. Biol.** 10
17. **Sugimura R,** Wang CY. (2022). The Role of Innate Lymphoid Cells in Cancer Development and Immunotherapy. **Front. Cell Dev. Biol.** 10
18. Gao S, **Sugimura R.** (2022). The Single-Cell Level Perspective of the Tumor Microenvironment and Its Remodeling by CAR-T Cells. **Cancer Treat. Res.** 183
19. Cao H, **Sugimura R.** (2022). Off-the-Shelf Chimeric Antigen Receptor Immune Cells from Human Pluripotent Stem Cells. **Cancer Treat. Res.** 183
20. Xiang Y, **Sugimura R.** (2021). Single-Cell Approaches to Deconvolute the Development of HSCs. **Cells.** doi.org/10.3390/cells10112876
21. Dong Y, Wong JSL, **Sugimura R,** Lam KO, Li B, Kwok GGW, Leung R, Chiu JWY, Cheung TT, Yau T. (2021). Recent Advances and Future Prospects in Immune Checkpoint (ICI)-Based Combination Therapy for Advanced HCC. **Cancers.** doi: 10.3390/cancers13081949
22. **Sugimura, R.** (2019). Derivation of Hematopoietic Stem and Progenitor Cells from Human Pluripotent Stem Cells. **Methods in Mol. Biol.** doi: 10.1007/978-1-4939-9524-0\_3.
23. **Sugimura, R.** (2018). The significance and application of vascular niche in the development and maintenance of hematopoietic stem cells. **Int. Journal of Hematology.** doi: 10.1007/s12185-018-2450-2.
24. **Sugimura R.** (2015). Bioengineering Hematopoietic Stem Cell Niche toward Regenerative Medicine **Adv Drug Deliv Rev.** S0169-409X(15)00235-5.
25. He XC, Li Z, **Sugimura R,** Ross J, Zhao M, and Li L. (2014). Homing and migration assays of hematopoietic stem/progenitor cells. **Methods in Mol Biol.** 1185:279-84.
26. Perry, J., He, X., **Sugimura, R.,** and Li, L. (2013). Stem Cell Dormancy: Maintaining a Reserved Population. **Advances in Molecular Biology and Medicine volume 1,** 119-132
27. **Sugimura, R.** and Li, L. (2011). Bone metastasis targets the endosteal hematopoietic stem cell niche. **IBMS BoneKEy,** 8, 381-384.
28. **Sugimura, R.,** and Li, L. (2010a). Noncanonical Wnt signaling in vertebrate development, stem cells, and diseases. **Birth Defects Res C Embryo Today** 90, 243-256.
29. **Sugimura, R.,** and Li, L. (2010b). Shifting in balance between osteogenesis and adipogenesis substantially influences hematopoiesis. **J Mol Cell Biol** 2, 61-62.

### **Press Releases:**

Los Angeles Times, 2017. Scientists get closer to making personalized blood cells by using patients' own stem cells.

<https://www.latimes.com/science/sciencenow/la-sci-sn-blood-stem-cells-20170517-story.html>

HKUMED, 2024. HKUMed researchers develop a robust platform to generate cells to enhance cancer immunotherapy efficacy.

<https://www.hku.hk/press/press-releases/detail/27082.html>