
BIOGRAPHICAL SKETCH

Chia-Lin Hsu

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NAME	POSITION TITLE
Chia-Lin Hsu	Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
National Taiwan University, Taipei, Taiwan	B.S.	1999	Zoology
National Yang-Ming University, Taipei, Taiwan	M.S.	2001	Microbiology and Immunology
Duke University, Durham, NC, U.S.A.	Ph.D.	2007	Immunology
Genentech, South San Francisco, CA, U.S.A.	Postdoc	2012	Immunology

Personal Statement:

Training as an immunologist and understanding how complicated and effective our immune system is has always been an endless pursuit. The immune system needs to develop and mature properly, recognize foreign insult, and initiate the proper inflammatory response to mount an effective response to fight off the pathogens. Once the threat is eliminated, the immune system enters the resolution phase to regain homeostasis. Dysregulation of any of these steps leads to the development of diseases. The activation of an immune response is an energy-consuming event, since active transcription, rapid production of proteins, and cell proliferation are all crucial parts of the inflammatory response. Metabolite transporters have a central role in redistributing essential biomolecules in and out of the cell in order to meet the metabolic demand and efficient recycling of metabolites that the body demands. My research interest is to understand how these metabolite transporters respond to and facilitate the development and activation of the immune system during homeostatic or disease settings.

Having extensive experience in both academic and industry settings have enabled me to gain valuable insights into the challenges each side faces. Mentoring young minds to ask key questions and support them to build up confidence and independence is a delight that comes with my position at academia; at the same time, it is also my goal to bridge basic research findings to the development of translational products. I enjoy and look forward to build up collaborations with scientists from different research disciplines.

Positions:

2022-present: Delegates

International Union of Immunological Societies

2022-present: Vice Secretary General

Chinese Society of Immunology, Taiwan

2022-present: Deputy Director

Laboratory Animal Center, NYMU

2021-present: Research and Development Group Leader

Laboratory Animal Center, NYMU

2019-present: Organizing Committee

Formosa Immunology Spring School & Symposium

2019-present: Associate Professor

Institute of Microbiology and Immunology, National Yang Ming Chiao Tung University, Taipei, Taiwan

2013-2019: Assistant Professor

Institute of Microbiology and Immunology, National Yang-Ming University, Taipei, Taiwan

2012-2013: Senior Scientist

Center of Therapeutic Innovation, Pfizer, San Francisco, California, U.S.A.

□ **Selected peer-reviewed publications (in chronological order):**

• Hsieh, Y.-T., Tsai, T.-L., Huang, S.-Y., Heng, J.-W., Huang, Y.-C., Tsai, P.-Y., Tu, C.-C., Chao, T.-L., Tsai, Y.-M., Chang, P.-C., Lee, C.-K., Yu, G.-Y., Chang, S.-Y., Dzhagalov, I.L. and **Hsu, C.-L.** (2023), IFN-stimulated metabolite transporter ENT3 facilitates viral genome release. *EMBO rep* e55286. DOI: <https://doi.org/10.15252/embr.202255286>

• Ching-Ya Chen, Fang-Yi Chou, Ya-Gin Chang, Chin-Jui Ho, Kuo-Chen Wu, **Chia-Lin Hsu**, Yijuang Chern, Chun-Jung Lin. Deletion of equilibrative nucleoside transporter 2 disturbs energy metabolism and exacerbates disease progression in an experimental model of Huntington's disease. *Neurobiology of Disease*. 177 (2023) 106004. DOI: <https://doi.org/10.1016/j.nbd.2023.106004>

• Tsung-Lin Tsai, Pei-Yuan Tsai, Ivan L.Dzhagalov, **Chia-Lin Hsu**. Protocol for standardized intrathymic injection in mice. *STAR protocols*. 2023 Jan. DOI: <https://doi.org/10.1016/j.xpro.2022.102010>

• Tyng-An Zhou, Hsuan-Po Hsu, Yueh-Hua Tu, Hui-Kuei Cheng, Chih-Yu Lin, Nien-Jung Chen, Jin-Wu Tsai, Ellen A Robey, Hsuan-Cheng Huang, **Chia-Lin Hsu**, Ivan L Dzhagalov. Thymic macrophages consist of two populations with distinct localization and origin. 2022 Nov. *eLife* 2022;11:e75148. DOI: <https://doi.org/10.7554/eLife.75148>

• Sandra Abril Herrera-Heredia, Hsuan-Po Hsu, Cheng-Yen Kao, Yu-Huan Tsai, Yu Yamaguchi, Axel Roers, **Chia-Lin Hsu** and Ivan L. Dzhagalov. Heparin is required for the formation of granules in connective tissue mast cells. *Frontiers in Immunology*, Nov 9, 2022, DOI:<http://doi.org/10.3389/fimmu.2022.1000405>

• Tsung-Lin Tsai, Tyng-An Zhou, Yu-Ting Hsieh, Ju-Chu Wang, Hui-Kuei Cheng, Chen-Hua Huang, Pei-Yuan Tsai, Hsiu-Han Fan, Hsing-Kai Feng, Yu-Chia Huang, Chen-Ching Lin, Chao-Hsiung Lin, Chih-Yu Lin, Ivan L. Dzhagalov, **Chia-Lin Hsu***. Multiomics reveal the central role of pentose phosphate pathway in resident thymic macrophages to cope with efferocytosis-associated stress. *Cell reports*, Vol. 40, ISSUE 2, 111065, JULY 12, 2022. DOI:<https://doi.org/10.1016/j.celrep.2022.111065> *corresponding author

• Fan HH, Tsai TL, Dzhagalov I, **Hsu CL***. Evaluation of Mitochondria Content and Function in Live Cells by Multi-color Flow Cytometric Analysis. *Methods in Molecular Biology*, 2021, Vol. 2276: 203-213. doi: 0.1007/978-1-0716-1266-8_15 *corresponding author

• Hsuan-Po Hsu, Yun-Tzu Chen, Yu-Ying Chen, Chih-Yu Lin, Po-Yu Chen, Shio-Yi Liao, Ciara Christianne Y. Lim, Yu Yamaguchi, **Chia-Lin Hsu**, Ivan L. Dzhagalov. Heparan sulfate is essential for thymus growth. *Journal of Biological Chemistry*, Feb, 2021, S0021-9258(21)00192-7, DOI: <https://doi.org/10.1016/j.jbc.2021.100419>

• Feng HK, CF Chu, Sun KH, **Hsu CL**, Dzhagalov I. Examination of Fas-induced apoptosis of murine thymocytes in thymic tissue slices reveals that Fas is

dispensable for negative selection. *Front. Cell Dev. Biol.*, 21 October 2020 DOI: <https://doi.org/10.3389/fcell.2020.586807>

- Hsu KH, Wei CW, Su YR, Chou T, Lin YL, Yang FC, Tsou AP, **Hsu CL**, Tseng PH, Chen NJ, Jeng KS, Leu CM. Upregulation of RelB in the miR-122 knockout mice contributes to increased levels of proinflammatory chemokines/cytokines in the liver and macrophages. *Immunology Letters*, 2020 Oct;226:22-30. DOI: <http://doi.org/10.1016/j.imlet.2020.06.015>.
- Zhou TA, **Hsu CL**, Dzhagalov IL*. Testing the Efficiency and Kinetics of Negative Selection Using Thymic Slices. *Methods Mol Biol.* 2020;2111:205-219. DOI: https://doi.org/10.1007/978-1-0716-0266-9_17.
- **Hsu CL***, Dzhagalov I. Metabolite Transporters—The Gatekeepers for T cell Metabolism. *Immunometabolism.* 2019;1:e190012. DOI: <https://doi.org/10.20900/immunometab20190012> *corresponding author
- **Hsu CL***, Dzhagalov I, Niu DM*. “Response to Chung et al.” *Genetics in Medicine Jan 22, 2019* * co-corresponding author
- Wei, C.W., Zhou, T.A., Dzhagalov, I.L., **Hsu, C.L.*** Multicolor Flow Cytometry-based Quantification of Mitochondria and Lysosomes in T Cells. *J. Vis. Exp.* e58844, doi:10.3791/58844 (2018). *corresponding author
- Wei CW, Lee CY, Lee DJ, Chu CF, Wang JC, Wang TC, Jane WN, Chang ZF, Leu CM, Dzhagalov I, **Hsu CL***. Equilibrative Nucleoside Transporter 3 regulates T cell homeostasis by coordinating lysosomal function with nucleoside availability. *Cell Reports* 23, 2018: 2330-2341. doi:10.1016/j.celrep.2018.04.077 *corresponding author
- Hsu MJ, Chang FP, Lu YH, Hung SC, Wang YC, Yang AH, Lee HR, Sung SH, Wang YF, Yu WC, Hsu TR, Huang, Chang SK, Dzhagalov I, **Hsu CL***, Niu DM*. Identification of Lysosomal and Extralysosomal Globotriaosylceramide (Gb3) Accumulations Before the Occurrence of Typical Pathological Changes in the Endomyocardial Biopsies of Fabry Disease Patients. *Genetics in Medicine* 06 June 2018: 21, 224-232 doi:10.1038/s41436-018-0010-z * co-corresponding author
- Hsu MJ, Hsiao W, Chang FP, Ding HT, Lu YH, Chang SK, Dzhagalov I, Niu DM, **Hsu CL***. Pathogenic T cells contribute to the later-onset (IVS4+919G>A) Fabry Disease cardiomyopathy (*submitted*) *corresponding author
- Chuang TY, Cheng AJ, Lan TY, Huang IH, Shiao CW, **Hsu CL**, Liu YW, Tseng PH, Chang ZF, Kuo JC. Suppression of LPS-induced inflammatory responses by the hydroxyl groups of dexamethasone. *Oncotarget* 2017 Jul 25;8(30):49735-49748
- Hsu TR, Hung SC, Chang FP, Yu WC, Sung SH, **Hsu CL**, Dzhagalov I, Yang CF, Chu TH, Lee HJ, Lu YH, Chang SK, Liao HC, Lin HY, Liao TC, Lee PC, Li HY, Yang AH, Ho HC, Chiang CC, Lin CY, Desnick RJ, Niu DM. Later Onset Fabry Disease, Cardiac Damage Progress in Silence, *Journal of the American College of Cardiology* 68, 2016: 2554-2563.
- **Hsu CL**, Lin W, Seshasayee D, Chen YH, Ding X, Lin Z, Suto E, Huang Z, Lee WP, Park H, Xu M, Sun M, Rangell L, Lutman JL, Ulufatu S, Stefanich E, Chalouni C, Sagolla M, Diehl L, Fielder P, Dean B, Balazs M and Martin F. Equilibrative Nucleoside Transporter 3 Deficiency Perturbs Macrophage Lysosome Functions and Homeostasis. *Science*, 6 January 2012: 89-92.

- Chung E, **Hsu CL**, and Kondo M. Constitutive MAP kinase activation in hematopoietic stem cells induces myelo-proliferative neoplasm. *PLoS One*, 2011;6(12):e28350. Epub 2011 Dec 2.
- **Hsu CL**, and Kondo M. To be or not to be: that is the question—Lineage Commitment in Hematopoiesis. *Current Immunology Reviews*, 2007 Nov;3 (4) pp. 258-268(11)
- **Hsu CL**, Kikuchi K, Kondo M. Activation of MEK/ERK signaling is involved in myeloid lineage commitment during hematopoiesis. *Blood*, 2007 Sep 1;110(5):1420-8. Epub 2007 May 29.
- **Hsu CL**, King-Fleischman AG, Lai AY, Matsumoto Y, Weissman IL, Kondo M. Antagonistic effect of CCAAT enhancer-binding protein-alpha and Pax5 in myeloid or lymphoid lineage choice in common lymphoid progenitors. *Proc Natl Acad Sci U S A*. 2006 Jan 17;103(3):672-7.
- Kikuchi K, Lai AY, **Hsu CL**, Kondo M. IL-7 receptor signaling is necessary for stage transition in adult B cell development through up-regulation of EBF. *J Exp Med*. 2005 Apr 18;201(8):1197-203.
- He YW, Li H, Zhang J, **Hsu CL**, Lin E, Zhang N, Guo J, Forbush KA, Bevan MJ. The extracellular matrix protein mindin is a pattern-recognition molecule for microbial pathogens. *Nat Immunol*. 2004 Jan;5(1):88-97.

□ **Research Funding:**

Da-You Wu memorial research fund 吳大猷先生紀念獎計畫

Ministry of Science and Technology (MOST), Taiwan
The Metabolic Adaptation of Thymic Resident Macrophages
2021/08/01-2024/07/31

Research Grant 整合型研究計畫

Ministry of Science and Technology (MOST), Taiwan
Treatment of Alzheimer's disease by overcoming energy crisis
2021/01/01-2023/05/31

Outstanding Young Investigator Awards 優秀年輕學者研究計畫

Ministry of Science and Technology (MOST), Taiwan
Investigate the regulatory role of Equilibrative Nucleoside Transporter 3 in infection and inflammation
2019/08/01-2022/07/31

Research Grant 整合型研究計畫

Ministry of Science and Technology (MOST), Taiwan
Investigate the role of ENT3 in microglia and its implication in the neuro-inflammation of Huntington Disease
2018/08/01~2021/07/31

Outstanding Young Investigator Awards 優秀年輕學者研究計畫

Ministry of Science and Technology (MOST), Taiwan
The immunometabolism between T cell activation and the control of nucleoside availability
2015/08/01~2019/07/31

Yen Tjing Ling Medical Foundation 嚴慶齡基金會研究計畫

Investigate the molecular mechanism of how nucleoside metabolism affects the function of macrophages

2018/01/01~2018/12/31

Yen Tjing Ling Medical Foundation 嚴慶齡基金會研究計畫

Investigate if nucleoside metabolism plays a role in the differentiation and function of macrophages

2017/01/01~2017/12/31

Veterans General Hospitals and University System of Taiwan Joint Research

Program 榮台聯大研究計畫

Investigate the immune cell functional abnormalities in Fabry Disease

2017/01/01~2017/12/31

Research Grant 個別型研究計畫

Ministry of Science and Technology (MOST), Taiwan

Effects of disturbed glycosphingolipid metabolism on immune regulation

2015/08/01~2016/07/31

Veterans General Hospitals and University System of Taiwan Joint Research

Program 榮台聯大研究計畫

Investigate the immune regulation in IVS4 Fabry disease patients

2016/01/01~2016/12/31

New Investigator Research Grant 新進人員研究計畫

Ministry of Science and Technology (MOST), Taiwan

The role of the nucleoside transporter ENT3 in T cell development and metabolism

2014/01/01~2015/07/31

Member of Research Center

Cancer Progression Research Center (腫瘤卓越研究中心), NYMU: 2019-Present

Disease Prevention Center (防疫中心), NYMU: 2020-Present

Invited talks (the past five years only):

Date	Conference name
2022/11/08	2022 ICCB & APOCB Joint Meeting*
2022/10/22	44 th The Chinese Society of Immunology Meeting
2022/03/29	Institute of Medical Biochemistry, NTU Medical School
2021/09/14	Female scientists in STEM, Ministry of Science and Technology
2020/11/23	Dep. of Pharmacology, National Taiwan University
2019/11/12	Institute of Molecular Genetics, NHRI
2019/09/02	Dept. Medical Research, Veteran's General Hospital, Taipei
2019/07/17	2019 BD Flow User Club Annual Meeting
2019/03/03	Gordon Research Conference: Lysosomal Diseases*
2018/10/28	40 th The Chinese Society of Immunology Meeting
2018/10/14	The 7th Cross straight immunology conference*
2018/06/01	Graduate Institute of Biomedical Science, Chang Gung University
2018/05/26	2018 Medical camp for high school students

* International conferences

Awards:

- 2023 NYCU Key Publication Award 陽明交通大學重要論文發表獎
- 2022 Chinese Society of Immunology Outstanding Research Award 中華民國免疫學會傑出研究獎
- 2021-2023 Outstanding research award 特殊優秀教研人才獎勵
- 2019-2021 Outstanding research award 教師研究卓越獎勵
- 2019 Ta-You Wu Memorial Award 吳大猷先生紀念獎
- 2019 VGH-UST outstanding research award 榮台聯大合作研究優良論文獎
- 2018 Li-Yang Shen memorial award 沈力揚先生紀念獎
- 2018 Shui-Te Shen memorial award for excellent immunology research 沈水德優秀論文獎
- 2018 VGH-UST research symposium poster award 榮台聯大合作研究優良壁報獎
- 2016 Teaching excellence award, School of life science, NYMU 陽明大學生命科學院優良教師獎

□ **Committee and Administrative activity:**

- Review Editor in T cell biology, Frontiers in immunology. 2022-present
- Review Editor in Molecular Innate Immunity, Frontiers in immunology. 2020-present
- Ad hoc Journal reviewer:
eLife, Frontiers in immunology, Journal of Microbiology, Immunology and Infection, Scientific Reports
- Ad hoc Funding reviewer:
Ministry of Science and Technology, Taiwan
- NYMU IACUC committee: 2016-2020
- Taiwan International Graduate Program (TIGP) steering committee: 2015- 2020
- Institute of Microbiology and Immunology, NYMU
Graduate Student Admission Committee: 2014- Present
Graduate Course Curriculum Committee: 2014- 2020
- Organizing Committee Formosa Immunology Spring School and Symposium (FISS): 2019-Present
- NYMU Student Affair committee: 2016- 2019
- NYCU Faculty Representative for NYCU University Council: 2022-Present
- School of Life Science Faculty Representative, NYMU: 2017- 2019, 2020-Present

□ **Mentoring activity:**

Ph.D. student:

- Yu-Ting Hsieh (2022- Present)
- Pei-Yuan Tsai(2021-Present), Ying-Sui Lu (2021-Present)
- Tsung-Lin Tsai (2021-2022)
- Hsui-Han Fan(2019-Present)

- Chin-Wen Wei (2014-2019)

M.S. student:

- Din-Jin Lee, Wen Hsiao (2015 graduate)
 - Chia-Yin Lee, Chia-Chun Tu, Share-Ler Tay, He-Ting Ding (2016 graduate),
 - Ming-Jia Hsu, Po-Kai Chou (2017 graduate),
 - Ju-Chu Wang, Tien-Chiao Wang (2018 graduate),
 - Hsui-Han Fan, Cheng-Han Tsai (2019 graduate),
 - Tsung-Lin Tsai, Bing-Yu Hung, Yu-Ting Hsieh (2010 graduate)
 - Jian-Wen Heng, Pei-Yuan Tsai, Ying-Sui Lu (2021 graduate)
 - Shen-Yen Huang (2022 graduate)
 - Yu-Chia Huang (2023 graduate)
 - Zi-Sean Shen (2023 graduate)
 - Yi-Ling Tseng, Tse-Sieng Tsai, Tze-Wei Tsai (2024 graduate)
- B.S. student: Tze-Han Chao (2016), Pham Hong Ha (2017), Jia-Chin Wei (2017), Sze-Huey Leong (2020), Tze-Ling Kuo (2021), Cathy Hsu (2021)
- M.D. student: Hui-Ju Cheng (2024), Shao-Chun Huang (2023), Huan-Yu Wu (2025)
- Summer interns: Monica Lu (Taipei American School, 2014), Stephanie Cheng (Taipei American School, 2015), Martina Kerndl (TIGP-IIP, 2016), Christine Chen (Taipei American School, 2017), Albert Ay (Michigan State University, U.S.A., 2021), Emma Kuok (Taipei American School, 2021)

指導學生得獎紀錄:

年度	競賽、會議名稱	學生 (碩/博)
2023	陽明大學優良研究論文比賽-微免所初賽	第二名: 沈子翔 (碩)
2023	37屆生醫年會永信基金會免疫學壁報競賽獎	謝毓庭 (博)
2023	Formosa Immunology Summer School 2023 Scholar	范琇涵 (博)
2023	Formosa Immunology Summer School 2023 Scholar	黃昱嘉 (碩)
2022	中華民國免疫學會口頭競賽獎	范琇涵 (博)
2022	中華民國免疫學會壁報競賽獎	黃昱嘉 (碩)
2022	中華民國免疫學會壁報競賽獎	蔡沛芄 (博)
2022	財團法人陳宗仁先生免疫學研究發展基金會獎學金	黃昱嘉 (碩)
2022	Formosa Immunology Summer School 2022 Poster Award	范琇涵 (博)
2022	陽明大學優良研究論文比賽微免所初賽	佳作: 黃昱嘉 (碩)
2022	中華民國免疫學會生醫年會口頭競賽	佳作: 黃昱嘉 (碩)
2021	陽明大學優良研究論文比賽-微免所初賽	第一名: 呂瑩穗 (碩) 第三名: 蔡沛芄 (碩)
2020	中華民國免疫學會生醫年會口頭競賽	蔡宗霖 (碩)
2020	陽明大學優良研究論文比賽決賽	蔡宗霖 (碩)
2020	陽明大學優良研究論文比賽微免所初賽	第一名: 蔡宗霖 (碩) 第三名: 洪秉煜 (碩)

		佳作:謝毓庭(碩)
2019	Formosa Immunology Spring School 2019	碩士班入選參與學者:蔡宗霖、謝毓庭
2019	Gordon conference: Phagocytes	壁報口頭報告: 范琇涵(碩)
2019	尹珣若論文比賽初審	第一名:范琇涵(碩)
2018	學術交流競賽	第二名:魏晉文(博)
2017	尹珣若論文比賽初審	佳作:王恬喬同學
2016	尹珣若論文比賽初審	佳作:徐明嘉同學
2016	罕見疾病基金會研究論文獎	徐明嘉
2016	生命科學系大學部專題壁報展	優等獎 趙姿涵
2015	尹珣若論文比賽初審	佳作:李佳螢同學 佳作:涂嘉峻同學
2015	罕見疾病基金會研究論文獎	丁鶴婷
2014	罕見疾病基金會研究論文獎	蕭雯