Cheng-Chang Chen, Assist. Prof. Dr.rer.nat.

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SUMMARY OF QUALIFICATIONS

- 15+ years research experience in scientific and medical laboratories focus in electrophysiology, cell biology, pharmacology, virology, neurology, and hematology, resulting in several high-profile publications in Science, Science Advances, Nature Protocols, Nature Communications, PNAS, EMBOJ., eLife., and Cell Chem Biol.
- 29+ Peer-reviewed publications. H-index 22+ (Google Scholar). 4 Honors. 2 Featured on cover story (Science, BBA). 0.5 The best possible grade for a dissertation thesis (*Summa Cum laude*) in LMU Munich. 18+ invited talks at international organizations, including Oxford University (UK), Cambridge (UK), LMU Munich (Germany), Gordon Research Conference (USA), Federation of European Neuroscience (France), Hannover Medical School (Germany), European Calcium Channel Conference (Austria), NTU and NYCU (Taiwan).

WORKING EXPERIENCE

Assistant Professorship, Clinical Laboratory Sciences and Medical Biotechnology, College of Medicine, National Taiwan University, Taipei, Taiwan (2021-present)

- Supervising and management of endolysosomal ion channel research group.
- Establishing and training of advanced electrophysiological techniques and Ca^{2+}-imaging.
- Responsible for teaching of Hematology, Clinical Hematology, and Laboratory Sciences and Medical Biotechnology, Cell biology, Cell biology protocols, and Introduction of Medical Technology.

Adjunct Assistant Research Fellow, Department of Laboratory Medicine, National Taiwan University Hospital, Taipei, Taiwan (2021-present)

- Responsible for teaching Clinical Hematology and automated blood cell counter

Postdoctoral fellow (wissenschaftlich Mitarbeiter und Mitarbeiterinnen sowie Lehrkräfte), **Department of Pharmacy, LMU** Munich, Munich, Germany (2014–2020)

- Design and implementation of high quality cutting-edge endolysosomal electrophysiology and pharmacology experiments.
- Identify novel agonists and antagonists from natural products and synthesized small molecule compounds for endolysosomal ion channel by innovative whole- endolysosomal patch-clamp technique.
- Investigate the roles of endolysosomal ion channels in pathogen infection, neurodegeneration diseases, metabolism diseases and tumorigenesis.
- Contributing to the internal knowledge and advancement of the electrophysiological expertise in endolysosomal electrophysiology, including modified conventional patch-clamp (HEKA/Axon systems) and low-/high-throughput planar patch-clamp (e.g., Port-a-Patch and SURFE²R N1).

HONOR AND STIPENDS

- 2025, Nominated for the Wu Ta-You Memorial Award, National Science and Technology Council (NSTC), Taiwan
- 2021, Special Outstanding Talent Award, National Taiwan University (NTU), Taiwan
- 2015, AbbVie Promotionspreis – Best Dissertation of the year Award, Department of Pharmacy, Ludwig-Maximilians-Universität München (LMU), Germany
- 2014, Oskar-Karl-Forster-Stipendium - Doctoral Dissertation Award, LMU, Germany
- 2010-13, Bayerische Forschungsstiftung Doktorandenstipendium (BFS) - The Bavarian Research Foundation PhD Scholarship Department of Pharmacy, Ludwig-Maximilians-Universität München (LMU), Germany

EDUCATION

- **Dr. rer. nat.** ***(Summa cum laude** / die Note: 0.5 / 3.9-4.0 GPA)* in the group of Prof. Dr. Martin Biel and Prof. Dr. med. Christian Wahl-Schott, Pharmacology for Natural Sciences. Ludwig-Maximilians-Universität München (LMU), Germany (2010-2014)
- **Master** in the group of Prof. Wolfgang. B. Fischer, Institute of Biophotonics Engineering, National Yang-Ming University, Taiwan (2007-2009)
- **Bachelor** of Medical Biotechnology, Department of Clinical Laboratory Sciences and Medical Biotechnology, National Taiwan University, Taiwan (2002-2006)

ACADEMIC ACTIVITIES

Publications (Peer-reviewed)

Z.-Q. Gu*, H.-T. Wang*, Y. Li*, E. Krogsaeter*, A. Lin, J. Lin, Y.-S. Liu, W.-S. Lin, W. Burton, M.-L. Liu, C. Feldmann, R. Tang, C.-W. Po, P.-S. Hou, N.-Y. Lin, J.-Y. Lin, T.-L. Chao, S.-Y. Chang, Z. Yang, M. Keller, C. Leser, S. Fenske, F. Bracher, C. Wahl-Schott, A. Galione, Y.-H. Tsai, C. Grimm, M. Biel, **C.-C. Chen**‡. TRPML2 channel modulation by PI(3,5)P_2 and small-molecule agonists controls endosomal vesicle dynamics. ***Biomedicine & Pharmacotherapy*** (2025) 189:118350

C. Abrahamian, R. Tang, R. Deutsch, L. Ouologuem, E. Weiden, V. Kudrina, J. Blenninger, J. Rilling, C. Feldmann, S. Kuss, Y. Stepanov, A. Scotto Rosato, G.T. Calvo, M. S. Soengas, D. Mayr, T. Fröhlich, T. Gudermann, M. Biel, C. Wahl-Schott, **C.-C. Chen**, K. Bartel & C. Grimm. Rab7a is a direct effector of the intracellular Ca^{2+} channel TPC2 regulating melanoma progression through modulation of the GSK3β/β-Catenin/MITF axis. ***Nature Communications*** (2024) 15:10008

K. Gibbs, L. Wang, Z. Yang, C. Anderson, J. Bourgeois, Y. Cao, M. Gaggioli, M. Biel, R. Puertollano, **C.-C. Chen** & D. Ko. Human variation impacting MCOLN2 restricts Salmonella Typhi replication by magnesium deprivation. ***Cell Genomics*** (2023) 3, 100290

J.-J. Lee, S.-T. Chen, J.-A. Lin, C.-H. Lin, H.-Y. Lin, Y.-H. Su, **C.-C. Chen**, M.-C. Lin, C.-Y. Kuo, M.-C. Haung, N.-Y. Lin. Truncation of GalNAc-type O-glycans suppresses CD44-mediated osteoclastogenesis and bone metastasis in breast cancer. ***Molecular Cancer Research*** (2023) 21:664-674.

B. Spix, E. Butz, **C.-C. Chen**, A. Scotto Rosato, R. Tang, A. Jeridi, V. Kudrina, E. Plesch, P. Wartenberg, E. Arlt, D. Briukhovetska, M. Ansari, G. Günes Günsel, T. Conlon, A. Wyatt, S. Wetzel, D. Teupser, L. Holdt, F. Ectors, I. Boekhoff, U. Boehm, J. García-Añoveros, P. Saftig, M. Giera, S. Kobold, H. Schiller, S. Zierler, T. Gudermann, C. Wahl-Schott, F. Bracher, A. Önder Yildirim, M. Biel, C. Grimm. Lung emphysema and impaired macrophage elastase clearance in mucolipin 3 deficient mice. ***Nature Communications*** (2022) 13:1

Y. Li, C. Schön, **C.-C. Chen**, Z. Yang, R. Liegl, E. Murenu, B. Schworm, N. Klugbauer, C. Grimm, C. Wahl-Schott, S. Michalakis, M. Biel. TPC2 promotes choroidal angiogenesis and inflammation in a mouse model of neovascular age-related macular degeneration. ***Life Science Alliance*** (2021) 4:8

P. Netcharoensirisuk, C. Abrahamian, R. Tang, **C.-C. Chen**, A. Scotto Rosato, W. Beyers, Y.-K. Chao, A. Filippini, S. Di Pietro, K. Bartel, M. Biel, A. Vollmar, K. Umehara, W. Eknamkul, C. Grimm. Flavonoids increase melanin production and reduce proliferation, migration and invasion of melanoma cells by blocking endolysosomal/melanosomal TPC2. ***Scientific Reports*** (2021) 11:1

M. Müller, S. Gerndt, Y.-K. Chao, T. Zisis, O.N.P. Nguyen, A. Gerwien, N. Urban, C. Müller, F.A. Gegenfurtner, F. Geisslinger, C. Ortler, **C.-C. Chen**, S. Zahler, M. Biel, M. Schaefer, C. Grimm, F. Bracher, A.M. Vollmar, K. Bartel K. Gene editing and synthetically accessible inhibitors reveal role for TPC2 in HCC cell proliferation and tumor growth. ***Cell Chemical Biology*** (2021) 11:S2451

C. Leser, N. Urban, M. Keller, S. Gerndt, **C.-C. Chen**, M. Schäfer, C. Grimm, F. Bracher. Chemical and pharmacological characterization of the TRPML calcium channel blockers ML-SI1 and ML-SI3. ***European Journal of Medicinal Chemistry*** (2021) 210:112966

C.-C. Chen*‡, E. Krogsaeter*, E. Butz, Y. Li, R. Puertollano, C. Wahl-Schott, M. Biel, C. Grimm. TRPML2 is an osmo-/mechano-sensitive cation channel in endolysosomal organelles. ***Science Advances*** (2020) 6;eabb5064

S. Gerndt*, Y.-K. Chao*, **C.-C. Chen***, Y. Yuan*, S. Burgstaller, A. S. Rosato, E. Krogsaeter, N. Urban, K. Jacob, O. N. P. Nguyen, M. Miller, M. Keller, A. Vollmar, T. Gudermann, J. Schredelseker, S. Zierler, E. Polishchuk, M. Schaefer, M. Biel, D. Medina, R. Malli, C. Wahl-Schott, F. Bracher, S. Patel, C. Grimm. Agonist-mediated switching of ion selectivity in two-pore channel 2 differentially promotes lysosomal function. ***EIife*** (2020) 9:e54712

E. Plesch*, **C.-C. Chen***, E. Butz*, A. S. Rosato, E. Krogsaeter, H. Yinan, K. Bartel, M. Keller, D. Robaa , D. Teupser, L. Holdt, A. M. Vollmar, W. Sippl, R. Puertollano, D. L. Medina, M. Biel, C. Wahl-Schott, F. Bracher, C. Grimm. Selective agonist of TRPML2 reveals direct role in chemokine release from innate immune cells. ***Elife*** (2018) 7, e39720

C.-C. Chen*, C. Cang*, S. Fenske, E. Butz, Y.-K. Chao, M. Biel, D. Ren, C. Wahl-Schott, C. Grimm. Patch clamp technique to characterize ion channels in enlarged individual endolysosomes. ***Nature Protocols*** (2017) 12:1639

C.-C. Chen*, E. Butz*, Y.-K. Chao, Y. Grishchuk, L. Becker, S. Heller, S. Slaugenhaupt, M. Biel, C. Wahl-Schott, C. Grimm. Small molecules for early endosome-specific patch clamping. ***Cell Chemical Biology*** (2017) 24; 7:907

Y.-K. Chao*, V. Schludi*, **C.-C. Chen**, E. Butz, P. Nguyen, M. Müller, J. Krüger, C. Kammerbauer, A. Vollmar, C. Berking, M. Biel, C. Wahl-Schott, C. Grimm. TPC2 polymorphisms associated with a hair pigmentation phenotype in humans result in gain of channel function by independent mechanisms. ***PNAS*** (2017) 114;41

N. Bobak*, S. Feliciangeli*, **C.-C. Chen**, I. B. Soussia, S. Bittner, S. Pagnotta, T. Ruck, M. Biel, C. Wahl-Schott, C. Grimm, S. G. Meuth, F. Lesage. Recombinant tandem of pore-domains in a Weakly Inward rectifying K+ channel 2 (TWIK2) forms active lysosomal channels. ***Scientific Reports*** (2017) 7; 649

Y. Sakurai, A. A. Kolokoltsov, **C.-C. Chen**, M. W. Tidwell, W. E. Bauta, N. Klugbauer, C. Grimm, C. Wahl-Schott, M. Biel, R. A. Davey. Two-pore channels control Ebola virus host cell entry and are drug targets for disease treatment. ***Science*** (2015) 347;6225:995 Featured on cover

M. Ruas, L. C. Davis, **C.-C. Chen**, K.-T. Chuang, T. Walseth, C. Grimm, A. J. Morgan, M. Biel, C. Wahl-Schott, J. Parrington, A. Galione. Expression of Ca2+-permeable two-pore channels rescues NAADP signalling in TPC-deficient cells. ***EMBO*** (2015) 34;13:1743

C.-C. Chen*, M. Keller*, M. Hess, R. Schiffmann, N. Urban, Michael Schaefer, F. Bracher, M. Biel, C. A. Wahl-Schott, and C. Grimm. A small molecule to restore function of TRPML1 mutant isoforms causing mucolipidosis type IV. ***Nature Communications*** *(*2014) 14;5:4681

C. Grimm, **C.-C. Chen***, L. M. Holdt*, S. Hassan*, S. Jörs, H. Cuny, S. Kissing, B. Schröder, E. Butz, B. Northoff, C. Müller, S. Spahn, J. Castonguay, C. A. Luber, M. Moser, R. Lüllmann-Rauch, C. Fendel, N. Klugbauer, O. Griesbeck, A. Haas, M. Mann, F. Bracher, D. Teupser, P. Saftig, M. Biel, and C. Wahl-Schott. High susceptibility to fatty liver disease in two-pore channel 2 deficient mice. ***Nature Communications*** (2014) 21;5:4699

M. P. Cuajungco, L. C. Basilio, T. Hart, **C.-C. Chen**, J. Silva, M. Biel, and C. Grimm. Cellular zinc levels are modulated by trpml1-tmem163 interactions. ***Traffic*** (2014)15;11:1247

X. Zong, S. Krause, **C.-C. Chen**, J. Krüger, C. Gruner, X. Cao-Ehlker, S. Fenske, C. Wahl-Schott and M. Biel. Regulation of HCN

channel activity by cyclic cytidine 3', 5'-monophosphate (cCMP). ***Journal of Biological Chemistry*** (2012) 287;32:26506

M. Skasko, A. Tokarev, **C.-C. Chen**, W. B. Fischer, S. K. Pillai, J. Guatelli. BST-2 is rapidly down-regulated from the cell surface by the HIV-1 protein Vpu: evidence for a post-ER mechanism of Vpu-action. ***Virology*** (2011) 411;1:65

C.-C. Chen, J. Krüger, I. Sramala, H.-J. Hsu, P. Henklein, Y.-M. A. Chen, W. B. Fischer. ORF 8a of SARS-CoV forms an ion channel: experiments and molecular dynamics simulations. ***Biochim. Biophys. Acta Biomembranes*** (2011) 1808;2:572 Featured on cover

Book Chapters

C.-C. Chen‡. Electrophysiological Techniques on the Study of Endolysosomal Ion Channels. ***Handbook of experimental pharmacology***. (Springer, 2023) C. Wahl-Schott, M. Biel, Eds. ISBN 978-3-031-31522-0

S. Rautenberg, M. Keller, C. Leser, **C.-C. Chen**, F. Bracher, C. Grimm. Expanding the Toolbox: Novel Modulators of Endolysosomal Cation Channels. ***Handbook of experimental pharmacology.*** (Springer, 2022) Series E-ISSN 1865-0325

C.-C. Chen, C. Grimm, C. Wahl-Schott, M. Biel. Endolysosomal patch-clamping: approaches to measure vesicular ion channel activities. ***Ion and Molecule Transport in Lysosomes***. (CRC Press, 2020) B. Gasnier, M. Zhu, Eds. ISBN 9781138560390.

Publications-Review articles (Peer-reviewed)

H.-T. Wang, **C.-C. Chen**‡. Patch-Clamp Techniques for Single Endolysosomal Vesicle Analysis. ***JoVE*** (2025) 4;218

S. Patel, Y. Yuan, **C.-C. Chen**, D. Jaślan, G. Gunaratne, C. Grimm, T. Rahman, J. Marchant. Electrophysiology of endolysosomal two-pore channels: A current account. ***Cells*** (2022) 11;15, 2368

C.-C. Chen‡, E. Krogsaeter, C.-Y. Kuo, M.-C. Huang, S.-Y. Chang, M. Biel. Endolysosomal cation channels point the way towards precision medicine of cancer and infectious diseases. ***Biomedicine & Pharmacotherapy*** (2022) 148;112751

C.-C. Chen‡, E. Krogsaeter, C. Grimm. Two-pore and TRP cation channels in endolysosomal osmo-/mechanosensation and volume regulation. ***BBA - Molecular Cell Research*** (2021) 1868:118921

B. Spix*, Y.-K. Chao*, C. Abrahamian*, **C.-C. Chen**, C. Grimm. TRPML cation channels in inflammation and immunity. ***Frontiers in Immunology*** (2020) 11;225

C. Grimm, E. Butz, **C.-C. Chen**, C. Wahl-Schott, M. Biel. From mucolipidosis type IV to Ebola: TRPML and two-pore channels at the crossroads of endolysosomal trafficking and disease. ***Cell Calcium*** (2017) 17; 30046, IF=3.7

C. Grimm, **C.-C. Chen**, C. Wahl-Schott, M. Biel. Two-Pore Channels: Catalyzers of endolysosomal transport and function. ***Front. Pharmacol.*** (2017) 8;45

** These authors contributed equally* ‡ *Corresponding author*

Invited talks and conferences (oral presentations and chair only)

1. *Targeting Endolysosomal Ion Channels by Electrophysiology: TRPML2 and Beyond.* Symposium on endolysosomal ion channels & diseases 2025, ELiD 2025, NTU College of Medicine, Taipei, Taiwan, 25.10.25 **Chair and Organizer**
2. *On-Demand Phosphoinositide Activation of TRPML2 Regulates Endosomal Calcium Release and Rab4⁺ Vesicle Trafficking*, The 5th European Calcium Channel Conference, Alpbach, Austria, 26-30.05.25
3. *Workshop: Introduction of endolysosomal patch-clamp recordings*, Bordeaux Neurocampus and School of Neuroscience, France, 14-16.10.24 Organizer: Cheng-Chang Chen and Eric Boué-Grabot
4. *Exploring Endolysosomal Ion Channels: Significance and Methodologies*, Bordeaux Neurocampus, France, 11.10.24 Host: Eric Boué-Grabot
5. Invited Chair of Trainee Talks, Exploring Contemporary Issues in Lysosomal Ca^{2+} Signalling, LysoNet Workshop II, Cambridge UK, 05.09.24 Host: Sandip Patel
6. *The On-Demand Functionality of TRPML2 in Endolysosomal System*. Symposium on endolysosomal ion channels & diseases 2024, ELiD 2024, NTU College of Medicine, Taipei, Taiwan, 30.08.24 **Chair and Organizer**
7. *Endolysosomal ion channels*, Universität Tübingen - National Taiwan University Online Science Fair, 14.11.23
8. *Using novel endo-lysosomal patch-clamp to investigate the mechanism of TPC2 and TRPML2 in viral trafficking and its implication in the viral diseases*, 2023 Biomedical Research Symposium of National Health Research Institutes, Taiwan, 10.08.23 Host: Rean Wu
9. *TRPML2 sets codes for redistribution of apical endosomes*, Walther-Straub-Institute for Pharmacology and Toxicology, Faculty of Medicine, Ludwig-Maximilians University (LMU) Munich, Germany. 03.02.23 Host: Christian Grimm
10. *TRPML2 activations determine intracellular vesicles specific distribution and functions*, Institute of Cardiovascular Physiology and Pathophysiology, Biomedical Center of the LMU Medical Faculty, Munich, Germany. 26.01.23 Host: Christian Wahl-Schott
11. *Endolysosomal ion channels point the way towards precision medicine*, Department of Laboratory Medicine, National Taiwan University Hospital, Taipei, Taiwan. 12.12.22 Host: Wen-Chien Chou
12. *The patch-clamp technique in endolysosomal ion channel research*, Brain Research Center (BRC), NYMU, Taiwan, 16.04.21 Host: Yeh-Shiu Chu
13. *Endo-lysosomal ion channels in health and disease*, Institute of Anatomy and Cell Biology, National Taiwan University, Taiwan, 25.06.19 Host: Neng-Yu Lin
14. *Characterization of TRPML2 in endolysosomes*, Institute for Neurophysiology, Hannover Medical School, Germany, 22.05.19 Host: Christian Wahl-Schott
15. *An electrophysiological approach to analyse TRPML2 in endolysosomes*, Oxford talk, Department of Pharmacy, University of Oxford, 27.07.18 Host: Antony Galione
16. *Characterization of TRPML2 on intracellular organelles from macrophages*, 3rd European Calcium Channel Conference 2018 (ECCC), Alpbach, Austria, 9-12.05.18 Chair: Martin Biel
17. *Endolysosomal ion channels: A new approach to treat NCL?* 3rd JNCL Young Investigator Symposium, NCL Foundation, Hamburg, Germany, 6-8.08.17
18. Instructor: *Whole Endolysosomal Patch Clamp Technique to analyze TRPML1 channel*, CAJAL Advanced Neuroscience Training Programme "Ion channels in the brain in health and disease", Bordeaux School of Neuroscience, FENS France, 4-22.09.17 Director:

Florian Lesage

19. *An electrophysiological approach to analyze organellar two-pore channels regulating Ebola virus infection*, Institute of Biophotonics, National Yang-Ming University, Taiwan, 04.01.16 Host: Wolfgang Fischer
20. *Two-Pore Channels and Tetrandrine Regulate Ebola Virus Infection*, Gordon Research Conference "Organellar Channels & Transporters", Waltham, USA, 14-19.06.15 Chair: Haoxing Xu

Third-party funding

2025/08-2028/07 Research Project Grant (National Science and Technology Council, Taiwan) PI
2025/01-2026/12 NSTC-DAAD (Taiwan-Germany) Project-Based Personnel Exchange Program, Co-PI with Martin Biel, LMU Munich
2025/01-2025/12 NTU-LMU Joint Seed Funding, Co-PI with Christian Wahl-Schott, LMU Munich, Germany
2025/01-2026/12 Programme of Integrated Actions (PIA) - ORCHID (TAIWAN), Co-PI with Eric Boué-Grabot, CNRS, France
2025/01-2027/12 Higher Education Sprout Project (Ministry of Education & National Taiwan University, Taiwan) PI
2024/01-2024/12 NTU-UBx Joint Seed Funding, Co-PI with Eric Boué-Grabot, University of Bordeaux, France
2023/02-2025/02 International Exchanges Award 2022 Cost Share Program (National Science and Technology Council, Taiwan – Royal Society, UK) Co-PI with Antony Galione, Oxford, UK
2022/01-2025/12 Career Development Grant, CDG (National Health Research Institutes, Taiwan) PI
2022/01-2024/12 Higher Education Sprout Project (Ministry of Education & National Taiwan University, Taiwan) PI
2021/08-2024/07 Research Project Grant (National Science and Technology Council, Taiwan) PI

Reviewer activities for scientific journals and funding agencies

Reviewer, e.g., for ACS Nano and Cells
Reviewer for National Science and Technology Council, Taiwan. National Taiwan University Hospital, Taiwan

Mentoring activity (Students):

Hsuan-Ti (Cindy) Wang, (2023-Present) 4 years Ye-Lin NTU Outstanding Ph.D. Scholarship
Alice C. Lin (2024-Present), 2024 Sophion Bioscience's Ion Channel Modulation Symposium (ICMS) Japan - Student Travel Grant; 2025 Taiwan-Germany Summer Institute Program (NSTC-DAAD)
Yi-Shan (Ena) Liu, 2025 Sophion Bioscience's Ion Channel Modulation Symposium (ICMS) Japan - Student Travel Grant