


Wah Chiu

Wallenberg-Bienenstock Professor and Professor of Bioengineering and of Microbiology and Immunology

Photon Science Directorate

 Curriculum Vitae available Online

CONTACT INFORMATION

• Administrative Contact

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Bio

BIO

Wah Chiu is a pioneer in methodology development for cryogenic electron microscopy (cryo-EM). His work has made multiple transformational contributions in developing single particle cryo-EM as a tool for the structural determination of molecular machines at atomic resolution. His lab has solved many cryo-EM structures including viruses, chaperonins, membrane proteins, ion channels, antigen-antibody complexes, protein-RNA complexes and RNA in collaboration with many scientists around the world. He continues to establish high standard testing and characterization protocols for cryo-EM instrumentation and to develop new image processing and modeling algorithms for cryo-EM structure determination. His current research focuses on developing cryogenic electron tomography (cryo-ET) to determine near atomic resolution structures of molecular complexes in situ.

ACADEMIC APPOINTMENTS

- Professor, Photon Science Directorate
- Professor, Bioengineering
- Professor, Microbiology & Immunology
- Member, Bio-X
- Member, Cardiovascular Institute
- Faculty Fellow, Sarafan ChEM-H
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Director, Division of CryoEM and Bioimaging, SSRL, SLAC National Accelerator Laboratory, (2018- present)

HONORS AND AWARDS

- M.J. Buerger Award, American Crystallographic Association (2021)
- Inaugural Wallenberg-Bienenstock Professor, Stanford University (2020)
- Elected Member, United States National Academy of Sciences (2012)
- Distinguished Scientist Award for the Biological Sciences, Microscopy Society of America (2014)

- Honorary Doctorate of Philosophy, University of Helsinki, Finland (2014)
- Elected Academician, Academia Sinica, Taiwan (2008)
- Barbara and Corbin J. Robertson Jr. Presidential Award for Excellence in Education, Baylor College of Medicine (2015)
- Elected Member, The Academy of Medicine, Engineering, and Science of Texas (2013)
- Distinguished Faculty Award, Baylor College of Medicine Alumni Association (2013)
- Distinguished Service Professorship, Baylor College of Medicine (2010)
- Achievement Award, Society of Chinese Bioscientists in America Houston Chapter (2011)
- Presidential Award, American Academy of Nanomedicine (2006)
- Research Fellow, Japan Society for the Promotion of Science (1999)
- Alexander von Humboldt Research Prize, Alexander von Humboldt Foundation (1996)
- Guggenheim Fellow, Guggenheim Foundation (1986)
- Presidential Scholar, Electron Microscopy Society of America (1974)
- Award of Merit, Oakland City Council (1972)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Board of Scientific Counselor, National Institute of Diabetes, Digestive and Kidney Diseases, National Institutes of Health (2024 - present)
- Member, Scientific Advisory Board, UniProt (2022 - present)
- Member, Scientific Advisory Board, Institute of Molecular Biology, Academia Sinica, Taiwan (2018 - present)
- Member, Advisory Committee, World-wide Protein Data Bank (wwPDB) (2010 - present)
- Member, Scientific Advisory Board, RCSB Protein Data Bank (2005 - present)

PROFESSIONAL EDUCATION

- Ph.D., University of California, Berkeley , Biophysics (1975)
- B.A., University of California, Berkeley , Physics (1969)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My research includes methodology improvements in single particle cryo-EM for atomic resolution structure determination of molecules and molecular machines, as well as in cryo-ET of cells and organelles towards subnanometer resolutions. We collaborate with many researchers around the country and outside the USA on understanding biological processes such as protein folding, virus assembly and disassembly, pathogen-host interactions, signal transduction, and transport across cytosol and membranes.

PROJECTS

- Cryo-EM of RNA and Molecular Machines - Stanford University (1/1/2018 - present)
- From structure to therapy for Huntington's disease - Stanford University (1/1/2018)
- Pathogen-Host interactions studied by cryo-EM and cryo-ET - Stanford University (1/1/2018 - present)
- CryoET of Neurons - Stanford University (3/1/2020 - present)

Teaching

COURSES

2023-24

- Cryogenic electron microscopy and tomography: BIOE 320 (Win)

2022-23

- Cryogenic electron microscopy and tomography: BIOE 320 (Spr)

2021-22

- Cryogenic electron microscopy and tomography: BIOE 320 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Korbin Kleczko, Rachael Kretsch

Postdoctoral Faculty Sponsor

Ian Cooney, Yanyan Zhao

Doctoral Dissertation Advisor (AC)

Robin Cai

Doctoral Dissertation Co-Advisor (AC)

Jacob Summers, Lily Xu

Doctoral (Program)

Ana Masaltseva, Jeongwoong Yoon, Grace Zhong, Xuetong Zhou

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Bioengineering (Phd Program)
- Biophysics (Phd Program)
- Microbiology and Immunology (Phd Program)

Publications

PUBLICATIONS

- **Chikungunya virus assembly and budding visualized in situ using cryogenic electron tomography.** *Nature microbiology*
Chmielewski, D., Schmid, M. F., Simmons, G., Jin, J., Chiu, W.
2022
- **CryoEM reveals the stochastic nature of individual ATP binding events in a group II chaperonin.** *Nature communications*
Zhao, Y., Schmid, M. F., Frydman, J., Chiu, W.
2021; 12 (1): 4754
- **Cryo-EM structures of full-length Tetrahymena ribozyme at 3.1 Å resolution.** *Nature*
Su, Z., Zhang, K., Kappel, K., Li, S., Palo, M. Z., Pintilie, G. D., Rangan, R., Luo, B., Wei, Y., Das, R., Chiu, W.
2021
- **Measurement of atom resolvability in cryo-EM maps with Q-scores.** *Nature methods*
Pintilie, G., Zhang, K., Su, Z., Li, S., Schmid, M. F., Chiu, W.
2020
- **Multi-scale 3D Cryo-Correlative Microscopy for Vitrified Cells.** *Structure (London, England : 1993)*
Wu, G. H., Mitchell, P. G., Galaz-Montoya, J. G., Hecksel, C. W., Sontag, E. M., Gangadharan, V. n., Marshman, J. n., Mankus, D. n., Bisher, M. E., Lytton-Jean, A. K., Frydman, J. n., Czymmek, K. n., Chiu, et al
2020
- **Visualizing virus assembly intermediates inside marine cyanobacteria.** *Nature*

- Dai, W., Fu, C., Raytcheva, D., Flanagan, J., Khant, H. A., Liu, X., Rochat, R. H., Haase-Pettingell, C., Piret, J., Ludtke, S. J., Nagayama, K., Schmid, M. F., King, et al
2013; 502 (7473): 707-10
- **Mechanism of folding chamber closure in a group II chaperonin** *NATURE*
Zhang, J., Baker, M. L., Schroeder, G. F., Douglas, N. R., Reissmann, S., Jakana, J., Dougherty, M., Fu, C. J., Levitt, M., Ludtke, S. J., Frydman, J., Chiu, W.
2010; 463 (7279): 379-U130
 - **Hub stability in the calcium calmodulin-dependent protein kinase II.** *Communications biology*
Chien, C., Puhl, H., Vogel, S. S., Molloy, J. E., Chiu, W., Khan, S.
2024; 7 (1): 766
 - **Outcomes of the EMDDataResource cryo-EM Ligand Modeling Challenge.** *Nature methods*
Lawson, C. L., Kryshatovych, A., Pintilie, G. D., Burley, S. K., #erný, J., Chen, V. B., Emsley, P., Gobbi, A., Joachimiak, A., Noreng, S., Prisant, M. G., Read, R. J., Richardson, et al
2024
 - **Missing Wedge Completion via Unsupervised Learning with Coordinate Networks.** *International journal of molecular sciences*
Van Veen, D., Galaz-Montoya, J. G., Shen, L., Baldwin, P., Chaudhari, A. S., Lyumkis, D., Schmid, M. F., Chiu, W., Pauly, J.
2024; 25 (10)
 - **Cryogenic electron tomography reveals novel structures in the apical complex of Plasmodium falciparum.** *mBio*
Sun, S. Y., Segev-Zarko, L., Pintilie, G. D., Kim, C. Y., Staggers, S. R., Schmid, M. F., Egan, E. S., Chiu, W., Boothroyd, J. C.
2024: e0286423
 - **Tertiary folds of the SL5 RNA from the 5' proximal region of SARS-CoV-2 and related coronaviruses.** *Proceedings of the National Academy of Sciences of the United States of America*
Kretsch, R. C., Xu, L., Zheludev, I. N., Zhou, X., Huang, R., Nye, G., Li, S., Zhang, K., Chiu, W., Das, R.
2024; 121 (10): e2320493121
 - **Cryogenic electron microscopy and tomography reveal imperfect icosahedral symmetry in alphaviruses.** *PNAS nexus*
Chmielewski, D., Su, G. C., Kaelber, J. T., Pintilie, G. D., Chen, M., Jin, J., Auguste, A. J., Chiu, W.
2024; 3 (3): pgae102
 - **CryoEM structures of the human CLC-2 voltage-gated chloride channel reveal a ball-and-chain gating mechanism.** *eLife*
Xu, M., Neelands, T., Powers, A. S., Liu, Y., Miller, S. D., Pintilie, G. D., Bois, J. D., Dror, R. O., Chiu, W., Maduke, M.
2024; 12
 - **Outcomes of the EMDDataResource Cryo-EM Ligand Modeling Challenge.** *Research square*
Lawson, C. L., Kryshatovych, A., Pintilie, G. D., Burley, S. K., #erný, J., Chen, V. B., Emsley, P., Gobbi, A., Joachimiak, A., Noreng, S., Prisant, M., Read, R. J., Richardson, et al
2024
 - **Targeted mutagenesis of the herpesvirus fusogen central helix captures transition states.** *Nature communications*
Zhou, M., Vollmer, B., Machala, E., Chen, M., Grünwald, K., Arvin, A. M., Chiu, W., Oliver, S. L.
2023; 14 (1): 7958
 - **Improving resolution and resolvability of single-particle cryoEM structures using Gaussian mixture models.** *Nature methods*
Chen, M., Schmid, M. F., Chiu, W.
2023
 - **Structural insights into the modulation of coronavirus spike tilting and infectivity by hinge glycans.** *Nature communications*
Chmielewski, D., Wilson, E. A., Pintilie, G., Zhao, P., Chen, M., Schmid, M. F., Simmons, G., Wells, L., Jin, J., Singharoy, A., Chiu, W.
2023; 14 (1): 7175
 - **Voices The next decade in structural biology** *STRUCTURE*
Walsh, M. A., Nannenga, B. L., Gonen, T., Sexton, P. M., Wootten, D., Chiu, W., Sun, F., Carragher, B., Potter, C. S., Agard, D., Burley, S. K.
2023; 31 (11): 1284-1288
 - **Cryo-electron tomography reveals the structural diversity of cardiac proteins in their cellular context.** *bioRxiv : the preprint server for biology*

- Woldeyes, R. A., Nishiga, M., Vander Roest, A. S., Engel, L., Giri, P., Montenegro, G. C., Wu, A. C., Dunn, A. R., Spudich, J. A., Bernstein, D., Schmid, M. F., Wu, J. C., Chiu, et al
2023
- **CryoEM structures of the human CLC-2 voltage gated chloride channel reveal a ball and chain gating mechanism.** *bioRxiv : the preprint server for biology*
Xu, M., Neelands, T., Powers, A. S., Liu, Y., Miller, S. D., Pintilie, G., Du Bois, J., Dror, R. O., Chiu, W., Maduke, M.
2023
 - **RNA target highlights in CASP15: Evaluation of predicted models by structure providers.** *Proteins*
Kretsch, R. C., Andersen, E. S., Bujnicki, J. M., Chiu, W., Das, R., Luo, B., Masquida, B., McRae, E. K., Schroeder, G. M., Su, Z., Wedekind, J. E., Xu, L., Zhang, et al
2023
 - **Development of human cellular model for ectopic calcification to study the physiopathological mechanism for Optic Disc Drusen (ODD)**
Patel, H., Imventarza, J., Kumar, A., Shariati, A., Iweka, C., Swarup, A., Kaushal, K., Modgil, S., Li, S., Nahmou, M., Wu, G., Chiu, W., Liao, et al
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2023
 - **Previously uncharacterized rectangular bacterial structures in the dolphin mouth.** *Nature communications*
Dudek, N. K., Galaz-Montoya, J. G., Shi, H., Mayer, M., Danita, C., Celis, A. I., Viehboeck, T., Wu, G., Behr, B., Bulgheresi, S., Huang, K. C., Chiu, W., Relman, et al
2023; 14 (1): 2098
 - **Integrated analyses reveal a hinge glycan regulates coronavirus spike tilting and virus infectivity.** *Research square*
Chmielewski, D., Wilson, E. A., Pintilie, G., Zhao, P., Chen, M., Schmid, M. F., Simmons, G., Wells, L., Jin, J., Singharoy, A., Chiu, W.
2023
 - **CryoET reveals organelle phenotypes in huntington disease patient iPSC-derived and mouse primary neurons.** *Nature communications*
Wu, G. H., Smith-Geater, C., Galaz-Montoya, J. G., Gu, Y., Gupte, S. R., Aviner, R., Mitchell, P. G., Hsu, J., Miramontes, R., Wang, K. Q., Geller, N. R., Hou, C., Danita, et al
2023; 14 (1): 692
 - **3D RNA-scaffolded wireframe origami.** *Nature communications*
Parsons, M. F., Allan, M. F., Li, S., Shepherd, T. R., Ratanalert, S., Zhang, K., Pullen, K. M., Chiu, W., Rouskin, S., Bathe, M.
2023; 14 (1): 382
 - **Near-Atomic Resolution Cryo-EM Image Reconstruction of RNA.** *Methods in molecular biology (Clifton, N.J.)*
Li, S., Zhang, K., Chiu, W.
2023; 2568: 179-192
 - **Structural visualization of the tubulin folding pathway directed by human chaperonin TRiC/CCT.** *Cell*
Gestaut, D., Zhao, Y., Park, J., Ma, B., Leitner, A., Collier, M., Pintilie, G., Roh, S. H., Chiu, W., Frydman, J.
2022; 185 (25): 4770-4787.e20
 - **Electron microscopy holdings of the Protein Data Bank: the impact of the resolution revolution, new validation tools, and implications for the future.** *Biophysical reviews*
Burley, S. K., Berman, H. M., Chiu, W., Dai, W., Flatt, J. W., Hudson, B. P., Kaelber, J. T., Khare, S. D., Kulczyk, A. W., Lawson, C. L., Pintilie, G. D., Sali, A., Vallat, et al
2022: 1-21
 - **Alphavirus Particles Can Assemble with an Alternate Triangulation Number.** *Viruses*
Kaelber, J. T., Chmielewski, D., Chiu, W., Auguste, A. J.
2022; 14 (12)
 - **Metallic Support Films Reduce Optical Heating in Cryogenic Correlative Light and Electron Tomography.** *Journal of structural biology*
Dahlberg, P. D., Perez, D., Hecksel, C. W., Chiu, W., Moerner, W. E.
2022: 107901
 - **Topological crossing in the misfolded Tetrahymena ribozyme resolved by cryo-EM.** *Proceedings of the National Academy of Sciences of the United States of America*
Li, S., Palo, M. Z., Pintilie, G., Zhang, X., Su, Z., Kappel, K., Chiu, W., Zhang, K., Das, R.
2022; 119 (37): e2209146119

- **Efficient manual annotation of cryogenic electron tomograms using IMOD.** *STAR protocols*
Danita, C., Chiu, W., Galaz-Montoya, J. G.
2022; 3 (3): 101658
- **Cryo-electron tomography with mixed-scale dense neural networks reveals key steps in deployment of Toxoplasma invasion machinery.** *PNAS nexus*
Segev-Zarko, L. A., Dahlberg, P. D., Sun, S. Y., Pelt, D. M., Kim, C. Y., Egan, E. S., Sethian, J. A., Chiu, W., Boothroyd, J. C.
2022; 1 (4): pgac183
- **Integrative Structural Biology to Understand Biological Complexity**
Chiu, W.
ELSEVIER.2022: S29
- **Planar 2D wireframe DNA origami.** *Science advances*
Wang, X., Li, S., Jun, H., John, T., Zhang, K., Fowler, H., Doye, J. P., Chiu, W., Bathe, M.
2022; 8 (20): eabn0039
- **Cryo-EM analysis of Ebola virus nucleocapsid-like assembly.** *STAR protocols*
Wang, Y., Binning, J. M., Pintilie, G. D., Chiu, W., Amarasinghe, G. K., Leung, D. W., Su, Z.
1800; 3 (1): 101030
- **Cryo-EM, Protein Engineering, and Simulation Enable the Development of Peptide Therapeutics against Acute Myeloid Leukemia.** *ACS central science*
Zhang, K., Horikoshi, N., Li, S., Powers, A. S., Hameedi, M. A., Pintilie, G. D., Chae, H., Khan, Y. A., Suomivuori, C., Dror, R. O., Sakamoto, K. M., Chiu, W., Wakatsuki, et al
2022; 8 (2): 214-222
- **Characterizing the distribution of myosin H in the apical complex of conoid protruded and conoid retracted Toxoplasma gondii**
Balaji, A., Dahlberg, P. D., Segev-Zarko, L., Sun, S., Chiu, W., Boothroyd, J., Moerner, W. E.
CELL PRESS.2022: 409A
- **Cryo-ET of Toxoplasma parasites gives subnanometer insight into tubulin-based structures.** *Proceedings of the National Academy of Sciences of the United States of America*
Sun, S. Y., Segev-Zarko, L., Chen, M., Pintilie, G. D., Schmid, M. F., Ludtke, S. J., Boothroyd, J. C., Chiu, W.
2022; 119 (6)
- **Corrigendum to "Electron crystallography of chiral and non-chiral small molecules" [Ultramicroscopy 232 (2022) 113417].** *Ultramicroscopy*
Zhou, W., Bammes, B., Mitchell, P. G., Betz, K., Chiu, W.
1800: 113474
- **Capturing the swelling of solid-electrolyte interphase in lithium metal batteries.** *Science (New York, N.Y.)*
Zhang, Z., Li, Y., Xu, R., Zhou, W., Li, Y., Oyakhire, S. T., Wu, Y., Xu, J., Wang, H., Yu, Z., Boyle, D. T., Huang, W., Ye, et al
1800; 375 (6576): 66-70
- **Methods and Applications of Campenot Trichamber Neuronal Cultures for the Study of Neuroinvasive Viruses.** *Methods in molecular biology (Clifton, N.J.)*
Tierney, W. M., Vicino, I. A., Sun, S. Y., Chiu, W., Engel, E. A., Taylor, M. P., Hogue, I. B.
2022; 2431: 181-206
- **Multimerization of Ebola GPΔtamucin on protein nanoparticle vaccines has minimal effect on elicitation of neutralizing antibodies.** *Frontiers in immunology*
Powell, A. E., Xu, D., Roth, G. A., Zhang, K., Chiu, W., Appel, E. A., Kim, P. S.
2022; 13: 942897
- **Altered Cardiac Energetics and Mitochondrial Dysfunction in Hypertrophic Cardiomyopathy.** *Circulation*
Ranjbarvaziri, S., Kooiker, K. B., Ellenberger, M., Fajardo, G., Zhao, M., Vander Roest, A. S., Woldeyes, R. A., Koyano, T. T., Fong, R., Ma, N., Tian, L., Traber, G. M., Chan, et al
2021
- **Electron crystallography of chiral and non-chiral small molecules.** *Ultramicroscopy*
Zhou, W., Bammes, B., Mitchell, P. G., Betz, K., Chiu, W.
2021; 232: 113417

- **A very special chaperonin: How does TRiC/CCT achieve tubulin folding?**
Gestaut, D., Zhao, Y., Park, J., Ma, B., Leitner, A., Collier, M., Aebersold, R., Roh, S., Chiu, W., Frydman, J.
WILEY.2021: 149
- **CryoEM reveals the stochastic nature of individual ATP binding events in a group II chaperonin.**
Zhao, Y., Schmid, M. F., Frydman, J., Chiu, W.
WILEY.2021: 144
- **Target highlights in CASP14: analysis of models by structure providers.** *Proteins*
Alexander, L. T., Lepore, R., Kryshstafovich, A., Adamopoulos, A., Alahuhta, M., Arvin, A. M., Bomble, Y. J., Bottcher, B., Breyton, C., Chiarini, V., Chinnam, N. B., Chiu, W., Fidelis, et al
2021
- **Rapid prototyping of arbitrary 2D and 3D wireframe DNA origami.** *Nucleic acids research*
Jun, H., Wang, X., Parsons, M. F., Bricker, W. P., John, T., Li, S., Jackson, S., Chiu, W., Bathe, M.
2021
- **Validation, analysis and annotation of cryo-EM structures.** *Acta crystallographica. Section D, Structural biology*
Pintilie, G., Chiu, W.
2021; 77 (Pt 9): 1142-1152
- **Cryo-EM and antisense targeting of the 28-kDa frameshift stimulation element from the SARS-CoV-2 RNA genome.** *Nature structural & molecular biology*
Zhang, K., Zheludev, I. N., Hagey, R. J., Haslecker, R., Hou, Y. J., Kretsch, R., Pintilie, G. D., Rangan, R., Kladwang, W., Li, S., Wu, M. T., Pham, E. A., Bernardin-Souibgui, et al
2021
- **Interpretation of RNA cryo-EM maps of various resolutions**
Kretsch, R., Das, R., Chiu, W.
INT UNION CRYSTALLOGRAPHY.2021: A217
- **Outcomes from EMDDataResource Model Challenges**
Lawson, C., Kryshstafovich, A., Chiu, W.
INT UNION CRYSTALLOGRAPHY.2021: C57
- **Quantifying resolvability of atomic features in cryo-EM maps using Q-scores**
Pintilie, G., Schmid, M. F., Chiu, W.
INT UNION CRYSTALLOGRAPHY.2021: C58
- **Outcomes from EMDDataResource Model Challenges**
Lawson, C., Kryshstafovich, A., Chiu, W.
INT UNION CRYSTALLOGRAPHY.2021: A219
- **Cryogenic Electron Microscopy for Energy Materials.** *Accounts of chemical research*
Zhang, Z., Cui, Y., Vila, R., Li, Y., Zhang, W., Zhou, W., Chiu, W., Cui, Y.
2021
- **Cryo-electron tomography provides topological insights into mutant huntingtin exon 1 and polyQ aggregates.** *Communications biology*
Galaz-Montoya, J. G., Shahmoradian, S. H., Shen, K., Frydman, J., Chiu, W.
2021; 4 (1): 849
- **Regulation of Reversible Conformational Change, Size Switching, and Immunomodulation of RNA Nanocubes.** *RNA (New York, N.Y.)*
Blanco Carcache, P. J., Guo, S., Li, H., Zhang, K., Xu, C., Chiu, W., Guo, P.
2021
- **REMBI: Recommended Metadata for Biological Images-enabling reuse of microscopy data in biology.** *Nature methods*
Sarkans, U., Chiu, W., Collinson, L., Darrow, M. C., Ellenberg, J., Grunwald, D., Heriche, J., Iudin, A., Martins, G. G., Meehan, T., Narayan, K., Patwardhan, A., Russell, et al
2021
- **RNA Nanotechnology to Build a Dodecahedral Genome of Single-Stranded RNA Virus.** *RNA biology*

- Li, H., Zhang, K., Binzel, D. W., Shlyakhtenko, L. S., Lyubchenko, Y., Chiu, W., Guo, P.
2021
- **Structural analyses of an RNA stability element interacting with poly(A).** *Proceedings of the National Academy of Sciences of the United States of America*
Torabi, S., Chen, Y., Zhang, K., Wang, J., DeGregorio, S. J., Vaidya, A. T., Su, Z., Pabit, S. A., Chiu, W., Pollack, L., Steitz, J. A.
2021; 118 (14)
 - **Evolution of Standardization and Dissemination of Cryo-EM Structures and Data Jointly by the Community, PDB and EMDB.** *The Journal of biological chemistry*
Chiu, W., Schmid, M. F., Pintilie, G., Lawson, C. L.
2021: 100560
 - **Structural and functional dissection of reovirus capsid folding and assembly by the prefoldin-TRiC/CCT chaperone network.** *Proceedings of the National Academy of Sciences of the United States of America*
Knowlton, J. J., Gestaut, D., Ma, B., Taylor, G., Seven, A. B., Leitner, A., Wilson, G. J., Shanker, S., Yates, N. A., Prasad, B. V., Aebersold, R., Chiu, W., Frydman, et al
2021; 118 (11)
 - **Structural and functional dissection of reovirus capsid folding and assembly by the prefoldin-TRiC/CCT chaperone network** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Knowlton, J. J., Gestaut, D., Ma, B., Taylor, G., Seven, A., Leitner, A., Wilson, G. J., Shanker, S., Yates, N. A., Prasad, B., Aebersold, R., Chiu, W., Frydman, et al
2021; 118 (11)
 - **Cryo-EM model validation recommendations based on outcomes of the 2019 EMDataResource challenge.** *Nature methods*
Lawson, C. L., Kryshchak, A., Adams, P. D., Afonine, P. V., Baker, M. L., Barad, B. A., Bond, P., Burnley, T., Cao, R., Cheng, J., Chojnowski, G., Cowtan, K., Dill, et al
2021; 18 (2): 156–64
 - **A Single Immunization with Spike-Functionalized Ferritin Vaccines Elicits Neutralizing Antibody Responses against SARS-CoV-2 in Mice.** *ACS central science*
Powell, A. E., Zhang, K., Sanyal, M., Tang, S., Weidenbacher, P. A., Li, S., Pham, T. D., Pak, J. E., Chiu, W., Kim, P. S.
2021; 7 (1): 183–99
 - **Cathode-Electrolyte Interphase in Lithium Batteries Revealed by Cryogenic Electron Microscopy** *MATTER*
Zhang, Z., Yang, J., Huang, W., Wang, H., Zhou, W., Li, Y., Li, Y., Xu, J., Huang, W., Chiu, W., Cui, Y.
2021; 4 (1)
 - **The N-terminus of varicella-zoster virus glycoprotein B has a functional role in fusion.** *PLoS pathogens*
Oliver, S. L., Xing, Y. n., Chen, D. H., Roh, S. H., Pintilie, G. D., Bushnell, D. A., Sommer, M. H., Yang, E. n., Carfi, A. n., Chiu, W. n., Arvin, A. M.
2021; 17 (1): e1008961
 - **Mapping the catalytic conformations of an assembly-line polyketide synthase module.** *Science (New York, N.Y.)*
Cogan, D. P., Zhang, K., Li, X., Li, S., Pintilie, G. D., Roh, S. H., Craik, C. S., Chiu, W., Khosla, C.
2021; 374 (6568): 729-734
 - **DARCNN: Domain Adaptive Region-based Convolutional Neural Network for Unsupervised Instance Segmentation in Biomedical Images**
Hsu, J., Chiu, W., Yeung, S., IEEE COMP SOC
IEEE COMPUTER SOC.2021: 1003-1012
 - **Three-Dimensional Analysis of Particle Distribution on Filter Layers inside N95 Respirators by Deep Learning.** *Nano letters*
Lee, H. R., Liao, L., Xiao, W., Vailionis, A., Ricco, A. J., White, R., Nishi, Y., Chiu, W., Chu, S., Cui, Y.
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