Stanford

Wah Chiu

Wallenberg-Bienenstock Professor and Professor of Bioengineering and, by courtesy, of Microbiology and Immunology

Photon Science Directorate

Curriculum Vitae available Online

CONTACT INFORMATION

- **Administrative Contact**

  JoAnn Polizzi

  Email joannp@slac.stanford.edu

  Tel 650-926-3357

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 (By courtesy), Microbiology and Immunology
- Member, Bio-X
- Member, Cardiovascular Institute
- 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 Neuro-degenerative diseases - 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

2025-26

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

2024-25

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

2023-24

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

2022-23

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

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

EJ Fine, Korbin Kleczko, Ernst Pulido

Postdoctoral Faculty Sponsor

Ian Cooney, David Flesher, Rachael Kretsch, Amos Nissley, Laura Pacoste

Doctoral Dissertation Advisor (AC)

Jane Lee

Doctoral Dissertation Co-Advisor (AC)

Yu Tin Lin, Jacob Summers

Doctoral (Program)

Seyone Chithrananda, Ana Masaltseva, Regina Sanchez Flores, Jeongwoong Yoon, Xuetong Zhou

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

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

Publications

PUBLICATIONS

- **Complex water networks visualized by cryogenic electron microscopy of RNA.** *Nature*
  Kretsch, R. C., Li, S., Pintilie, G., Palo, M. Z., Case, D. A., Das, R., Zhang, K., Chiu, W.
  2025
- **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
- **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
- **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
- **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

- **Cryo-EM in enzymology and dynamics.** *Structure (London, England : 1993)*
  Tsai, M. D., Wolf, M., Chang, C. M., Chiu, W.
  2026; 34 (5): 675-680

- **Cryogenic electron tomography reveals herpesvirus capsid assembly intermediates inside the cell nucleus.** *Nature communications*
  Oliver, S. L., Chen, M., Engel, L., Hecksel, C. W., Zhou, X., Schmid, M. F., Arvin, A. M., Chiu, W.
  2026

- **Molecular mechanism of exchange coupling in CLC chloride/proton antiporters.** *Nature communications*
  Aydin, D., Chien, C. T., Kreiter, J., Nava, A. R., Portasikova, J. M., Fojtik, L., Sobecks, B. L., Mosquera, C., Man, P., Dror, R. O., Chiu, W., Maduke, M.
  2026

- **Cryogenic electron microscopy and tomography for beam-sensitive materials** *NATURE REVIEWS PHYSICS*
  Cui, Y., Zhang, Z., Sinclair, R., Chiu, W.
  2025

- **Blind Prediction of Complex Water and Ion Ensembles Around RNA in CASP16.** *Proteins*
  Kretsch, R. C., Posani, E., Baulin, E. F., Bujnicki, J. M., Bussi, G., Cheatham, T. E., Chen, S. J., Elofsson, A., Farsani, M. A., Fisher, O. N., Gromiha, M. M., Gupta, A., Hamada, et al
  2025

- **Functional Relevance of CASP16 Nucleic Acid Predictions as Evaluated by Structure Providers.** *Proteins*
  Kretsch, R. C., Albrecht, R., Andersen, E. S., Chen, H. A., Chiu, W., Das, R., Gezelle, J. G., Hartmann, M. D., Höbartner, C., Hu, Y., Jadhav, S., Johnson, P. E., Jones, et al
  2025

- **Visualizing dynamic tubulin folding in chaperonin TRiC from nonnative nucleus to final native state.** *Nature communications*
  Zhao, Y., Schmid, M. F., Chiu, W.
  2025; 16 (1): 7878

- **Q-score as a reliability measure for protein, nucleic acid and small-molecule atomic coordinate models derived from 3DEM maps.** *Acta crystallographica. Section D, Structural biology*
  Pintilie, G., Shao, C., Wang, Z., Hudson, B. P., Flatt, J. W., Schmid, M. F., Morris, K. L., Burley, S. K., Chiu, W.
  2025

- **Cryogenic electron tomography and elemental analysis of mitochondrial granules in human retinal ganglion cells.** *Structure (London, England : 1993)*
  Wu, G. H., Hou, C., Thron, A., Patel, H. R., Spillane, L., Gupte, S. R., Yeung-Levy, S., Gulati, S., Booth, C., Liao, Y. J., Chiu, W.
  2025

- **Resolving three-dimensional nanoscale heterogeneities in lithium metal batteries with cryoelectron tomography** *MATTER*
  Zhang, Z., Lee, J. K. J., Li, Y., Zhou, W., Wu, G., Lyu, H., Wan, J., Chen, H., Huang, W., Ye, Y., Schmid, M. F., Cui, Y., Chiu, et al
  2025; 8 (7)

- **Naturally ornate RNA-only complexes revealed by cryo-EM.** *Nature*
  Kretsch, R. C., Wu, Y., Shabalina, S. A., Lee, H., Nye, G., Koonin, E. V., Gao, A., Chiu, W., Das, R.
  2025

- **Single-particle cryogenic electron microscopy structure determination for membrane proteins.** *Current opinion in structural biology*
  Chien, C. T., Maduke, M., Chiu, W.
  2025; 92: 103047

- **MFSD6 is an entry receptor for enterovirus D68.** *Nature*

Varanese, L., Xu, L., Peters, C. E., Pintilie, G., Roberts, D. S., Raj, S., Liu, M., Ooi, Y. S., Diep, J., Qiao, W., Richards, C. M., Callaway, J., Bertozzi, et al
2025

- **MicroVQA: A Multimodal Reasoning Benchmark for Microscopy-Based Scientific Research.** *ArXiv*
  Burgess, J., Nirschl, J. J., Bravo-Sánchez, L., Lozano, A., Gupte, S. R., Galaz-Montoya, J. G., Zhang, Y., Su, Y., Bhowmik, D., Coman, Z., Hasan, S. M., Johannesson, A., Leineweber, et al
  2025

- **MicroVQA: A Multimodal Reasoning Benchmark for Microscopy-Based Scientific Research**
  Burgess, J., Nirschl, J. J., Bravo-Sanchez, L., Lozano, A., Gupte, S., Galaz-Montoya, J. G., Zhang, Y., Su, Y., Bhowmik, D., Coman, Z., Hasan, S. M., Johannesson, A., Leineweber, et al
  IEEE COMPUTER SOC.2025: 19552-19564

- **RNA-Puzzles Round V: blind predictions of 23 RNA structures.** *Nature methods*
  Bu, F., Adam, Y., Adamiak, R. W., Antczak, M., de Aquino, B. R., Badepally, N. G., Batey, R. T., Baulin, E. F., Boinski, P., Boniecki, M. J., Bujnicki, J. M., Carpenter, K. A., Chacon, et al
  2024

- **Cost-benefit analysis of cryogenic electron tomography subtomogram averaging of chaperonin MmCpn at near atomic resolution.** *Structure (London, England : 1993)*
  Zhao, Y., Schmid, M. F., Chiu, W.
  2024

- **Dramatic changes in mitochondrial subcellular location and morphology accompany activation of the CO2 concentrating mechanism.** *Proceedings of the National Academy of Sciences of the United States of America*
  Findinier, J., Joubert, L. M., Fakhimi, N., Schmid, M. F., Malkovskiy, A. V., Chiu, W., Burlacot, A., Grossman, A. R.
  2024; 121 (43): e2407548121

- **Electrified Operando-Freezing of Electrocatalytic CO2 Reduction Cells for Cryogenic Electron Microscopy.** *Nano letters*
  Li, Y., Liu, Y., Zhang, Z., Zhou, W., Xu, J., Ye, Y., Peng, Y., Xiao, X., Chiu, W., Sinclair, R., Li, Y., Cui, Y.
  2024

- **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 EMDataResource cryo-EM Ligand Modeling Challenge.** *Nature methods*
  Lawson, C. L., Kryshtafovych, A., Pintilie, G. D., Burley, S. K., Černý, J., Chen, V. B., Emsley, P., Gobbi, A., Joachimiak, A., Noreng, S., Prisant, M. G., Read, R. J., Richardson, et al
  2024

- **Invitro modeling of Optic Disc Drusen (ODD) using iPSC-derived retinal cells**
  Patel, H., Parte, S., Kumar, A., Kaushal, K., Swarup, A., Shariati, A., Liang, J., Wu, G., Iweka, C., Liu, L., Wu, A. Y., Chiu, W., Liao, et al
  ASSOC RESEARCH VISION OPHTHALMOLOGY INC.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
- **New insights into the molecular mechanisms of the coupling of proton and chloride in ClC antiporters**
  Nava, A. R., Kreiter, J., Chien, C., Aydin, D., Salcedo, C., Trifkovic, N., Chiu, W., Chiu, W., Dror, R. O., Maduke, M.
  CELL PRESS.2024: 400A
- **Outcomes of the EMDataResource Cryo-EM Ligand Modeling Challenge.** *Research square*
  Lawson, C. L., Kryshtafovych, A., Pintilie, G. D., Burley, S. K., Černý, 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., Grünewald, 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
- **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 GPDeltamucin 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., Kryshtafovych, 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
- **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

- **Interpretation of RNA cryo-EM maps of various resolutions**
  Kretsch, R., Das, R., Chiu, W.
  INT UNION CRYSTALLOGRAPHY.2021: A217
- **Outcomes from EMDataResource Model Challenges**
  Lawson, C., Kryshstafovych, A., Chiu, W.
  INT UNION CRYSTALLOGRAPHY.2021: C57
- **Quantifiying 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 EMDataResource Model Challenges**
  Lawson, C., Kryshtafovych, 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., Kryshtafovych, 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
- **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
- **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.
  2020
- **3D RNA nanocage for encapsulation and shielding of hydrophobic biomolecules to improve the in vivo biodistribution.** *Nano research*
  Xu, C., Zhang, K., Yin, H., Li, Z., Krasnoslobodtsev, A., Zheng, Z., Ji, Z., Guo, S., Li, S., Chiu, W., Guo, P.
  2020; 13 (12): 3241-3247
- **Resolving individualatoms of protein complex by cryo-electron microscopy.** *Cell research*
  Zhang, K., Pintilie, G. D., Li, S., Schmid, M. F., Chiu, W.
  2020
- **Unique cellular protrusions mediate breast cancer cell migration by tethering to osteogenic cells.** *NPJ breast cancer*
  Muscarella, A. M., Dai, W., Mitchell, P. G., Zhang, W., Wang, H., Jia, L., Stossi, F., Mancini, M. A., Chiu, W., Zhang, X. H.
  2020; 6 (1): 42
- **3D RNA nanocage for encapsulation and shielding of hydrophobic biomolecules to improve the in vivo biodistribution** *NANO RESEARCH*
  Xu, C., Zhang, K., Yin, H., Li, Z., Krasnoslobodtsev, A., Zheng, Z., Ji, Z., Guo, S., Li, S., Chiu, W., Guo, P.
  2020
- **Publisher Correction: A glycoprotein B-neutralizing antibody structure at 2.8 A uncovers a critical domain for herpesvirus fusion initiation.** *Nature communications*
  Oliver, S. L., Xing, Y., Chen, D., Roh, S. H., Pintilie, G. D., Bushnell, D. A., Sommer, M. H., Yang, E., Carfi, A., Chiu, W., Arvin, A. M.
  2020; 11 (1): 4398
- **A glycoprotein B-neutralizing antibody structure at 2.8A uncovers a critical domain for herpesvirus fusion initiation.** *Nature communications*
  Oliver, S. L., Xing, Y., Chen, D., Roh, S. H., Pintilie, G. D., Bushnell, D. A., Sommer, M. H., Yang, E., Carfi, A., Chiu, W., Arvin, A. M.
  2020; 11 (1): 4141
- **Opportunities for Cryogenic Electron Microscopy in Materials Science and Nanoscience.** *ACS nano*

Li, Y., Huang, W., Li, Y., Chiu, W., Cui, Y.
2020

- **Cryogenic single-molecule fluorescence annotations for electron tomography reveal in situ organization of key proteins in Caulobacter.** *Proceedings of the National Academy of Sciences of the United States of America*
  Dahlberg, P. D., Saurabh, S., Sartor, A. M., Wang, J., Mitchell, P. G., Chiu, W., Shapiro, L., Moerner, W. E.
  2020
- **Cryo-EM structures of NPC1L1 reveal mechanisms of cholesterol transport and ezetimibe inhibition.** *Science advances*
  Huang, C., Yu, X., Fordstrom, P., Choi, K., Chung, B. C., Roh, S., Chiu, W., Zhou, M., Min, X., Wang, Z.
  2020; 6 (25): eabb1989
- **Cryo-EM Structures of Human Drosha and DGCR8 in Complex with Primary MicroRNA.** *Molecular cell*
  Partin, A. C., Zhang, K., Jeong, B., Herrell, E., Li, S., Chiu, W., Nam, Y.
  2020
- **Inhibition mechanisms of AcrF9, AcrF8, and AcrF6 against type I-F CRISPR-Cas complex revealed by cryo-EM.** *Proceedings of the National Academy of Sciences of the United States of America*
  Zhang, K., Wang, S., Li, S., Zhu, Y., Pintilie, G. D., Mou, T., Schmid, M. F., Huang, Z., Chiu, W.
  2020
- **Structure of the G protein chaperone and guanine nucleotide exchange factor Ric-8A bound to Galphai1.** *Nature communications*
  McClelland, L. J., Zhang, K., Mou, T., Johnston, J., Yates-Hansen, C., Li, S., Thomas, C. J., Doukov, T. I., Triest, S., Wohlkonig, A., Tall, G. G., Steyaert, J., Chiu, et al
  2020; 11 (1): 1077
- **Ultra-thermostable RNA nanoparticles for solubilizing and high-yield loading of paclitaxel for breast cancer therapy.** *Nature communications*
  Guo, S., Vieweger, M., Zhang, K., Yin, H., Wang, H., Li, X., Li, S., Hu, S., Sparreboom, A., Evers, B. M., Dong, Y., Chiu, W., Guo, et al
  2020; 11 (1): 972
- **Cryogenic Superresolution Fluorescence Correlated with Cryogenic Electron Tomography: Combining Specific Labeling and High Resolution**
  Dahlberg, P. D., Saurabh, S., Wang, J., Sartor, A. M., Chiu, W., Shapiro, L., Moerner, W. E.
  CELL PRESS.2020: 20A–21A
- **TrkA undergoes a tetramer-to-dimer conversion to open TrkH which enables changes in membrane potential.** *Nature communications*
  Zhang, H., Pan, Y., Hu, L., Hudson, M. A., Hofstetter, K. S., Xu, Z., Rong, M., Wang, Z., Prasad, B. V., Lockless, S. W., Chiu, W., Zhou, M.
  2020; 11 (1): 547
- **Decontamination of SARS-CoV-2 and Other RNA Viruses from N95 Level Meltblown Polypropylene Fabric Using Heat under Different Humidities.** *ACS nano*
  Campos, R. K., Jin, J. n., Rafael, G. H., Zhao, M. n., Liao, L. n., Simmons, G. n., Chu, S. n., Weaver, S. C., Chiu, W. n., Cui, Y. n.
  2020
- **A 3.4-Å cryo-electron microscopy structure of the human coronavirus spike trimer computationally derived from vitrified NL63 virus particles.** *QRB discovery*
  Zhang, K., Li, S., Pintilie, G., Chmielewski, D., Schmid, M. F., Simmons, G., Jin, J., Chiu, W.
  2020; 1: e11
- **Cryogenic Correlative Single-Particle Photoluminescence Spectroscopy and Electron Tomography for Investigation of Nanomaterials.** *Angewandte Chemie (International ed. in English)*
  Dahlberg, P. D., Perez, D. n., Su, Z. n., Chiu, W. n., Moerner, W. E.
  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
- **Arrangement of the Polymerase Complexes inside a Nine-Segmented dsRNA Virus.** *Structure (London, England : 1993)*
  Kaelber, J. T., Jiang, W. n., Weaver, S. C., Auguste, A. J., Chiu, W. n.

2020

- **Cryo-EM structures of NPC1L1 reveal mechanisms of cholesterol transport and ezetimibe inhibition.** *Science advances*
  Huang, C. S., Yu, X. n., Fordstrom, P. n., Choi, K. n., Chung, B. C., Roh, S. H., Chiu, W. n., Zhou, M. n., Min, X. n., Wang, Z. n.
  2020; 6 (25)
- **Evolving data standards for cryo-EM structures.** *Structural dynamics (Melville, N.Y.)*
  Lawson, C. L., Berman, H. M., Chiu, W. n.
  2020; 7 (1): 014701
- **A single immunization with spike-functionalized ferritin vaccines elicits neutralizing antibody responses against SARS-CoV-2 in mice.** *bioRxiv : the preprint server for biology*
  Powell, A. E., Zhang, K. n., Sanyal, M. n., Tang, S. n., Weidenbacher, P. A., Li, S. n., Pham, T. D., Pak, J. E., Chiu, W. n., Kim, P. S.
  2020
- **Cryo-EM and MD infer water-mediated proton transport and autoinhibition mechanisms of Vo complex.** *Science advances*
  Roh, S. H., Shekhar, M. n., Pintilie, G. n., Chipot, C. n., Wilkens, S. n., Singharoy, A. n., Chiu, W. n.
  2020; 6 (41)
- **Accelerated cryo-EM-guided determination of three-dimensional RNA-only structures.** *Nature methods*
  Kappel, K. n., Zhang, K. n., Su, Z. n., Watkins, A. M., Kladwang, W. n., Li, S. n., Pintilie, G. n., Topkar, V. V., Rangan, R. n., Zheludev, I. N., Yesselman, J. D., Chiu, W. n., Das, et al
  2020; 17 (7): 699–707
- **Preface.** *Progress in biophysics and molecular biology*
  Lok, S. M., Chiu, W. n.
  2020
- **Unique cellular protrusions mediate breast cancer cell migration by tethering to osteogenic cells.** *NPJ breast cancer*
  Muscarella, A. M., Dai, W., Mitchell, P. G., Zhang, W., Wang, H., Jia, L., Stossi, F., Mancini, M. A., Chiu, W., Zhang, X. H.
  2020; 6: 42
- **Full-length three-dimensional structure of the influenza A virus M1 protein and its organization into a matrix layer.** *PLoS biology*
  Selzer, L. n., Su, Z. n., Pintilie, G. D., Chiu, W. n., Kirkegaard, K. n.
  2020; 18 (9): e3000827
- **Federating Structural Models and Data: Outcomes from A Workshop on Archiving Integrative Structures** *STRUCTURE*
  Berman, H. M., Adams, P. D., Bonvin, A. A., Burley, S. K., Carragher, B., Chiu, W., DiMaio, F., Ferrin, T. E., Gabanyi, M. J., Goddard, T. D., Griffin, P. R., Haas, J., Hanke, et al
  2019; 27 (12): 1745–59
- **Unravelling Degradation Mechanisms and Atomic Structure of Organic-Inorganic Halide Perovskites by Cryo-EM** *JOULE*
  Li, Y., Zhou, W., Li, Y., Huang, W., Zhang, Z., Chen, G., Wang, H., Wu, G., Rolston, N., Vila, R., Chiu, W., Cui, Y.
  2019; 3 (11): 2854–66
- **Unravelling Atomic Structure and Degradation Mechanisms of Organic-Inorganic Halide Perovskites by Cryo-EM.** *Joule*
  Li, Y., Zhou, W., Li, Y., Huang, W., Zhang, Z., Chen, G., Wang, H., Wu, G. H., Rolston, N., Vila, R., Chiu, W., Cui, Y.
  2019; 3 (11): 2854-2866
- **Structural basis of amino acid surveillance by higher-order tRNA-mRNA interactions.** *Nature structural & molecular biology*
  Li, S., Su, Z., Lehmann, J., Stamatopoulou, V., Giarimoglou, N., Henderson, F. E., Fan, L., Pintilie, G. D., Zhang, K., Chen, M., Ludtke, S. J., Wang, Y., Stathopoulos, et al
  2019
- **Cryo-electron microscopy targets in CASP13: Overview and evaluation of results** *PROTEINS-STRUCTURE FUNCTION AND BIOINFORMATICS*
  Kryshtafovych, A., Malhotra, S., Monastyrskyy, B., Cragnolini, T., Joseph, A., Chiu, W., Topf, M.
  2019; 87 (12): 1128–40
- **Segmentation and Comparative Modeling in an 8.6-angstrom Cryo-EM Map of the Singapore Grouper Iridovirus** *STRUCTURE*
  Pintilie, G., Chen, D., Bich Ngoc Tran, Jakana, J., Wu, J., Hew, C., Chiu, W.

2019; 27 (10): 1561-+

- **Rapid RNA structure determination through cryo-EM, high-throughput biochemistry, and computational modeling**
  Kappel, K., Zhang, K., Su, Z., Pintilie, G., Chiu, W., Das, R.
  AMER CHEMICAL SOC.2019
- **Cryo-EM Structures of Atomic Surfaces and Host-Guest Chemistry in Metal-Organic Frameworks** *MATTER*
  Li, Y., Wang, K., Zhou, W., Li, Y., Vila, R., Huang, W., Wang, H., Chen, G., Wu, G., Tsao, Y., Wang, H., Sinclair, R., Chiu, et al
  2019; 1 (2): 428–38
- **Cryo-EM structures of atomic surfaces and host-guest chemistry in metal-organic frameworks.** *Matter*
  Li, Y., Wang, K., Zhou, W., Li, Y., Vila, R., Huang, W., Wang, H., Chen, G., Wu, G. H., Tsao, Y., Wang, H., Sinclair, R., Chiu, et al
  2019; 1 (2): 428-438
- **Redox Engineering of Cytochrome c using DNA Nanostructure-Based Charged Encapsulation and Spatial Control.** *ACS applied materials & interfaces*
  Ge, Z., Su, Z., Simmons, C. R., Li, J., Jiang, S., Li, W., Yang, Y., Liu, Y., Chiu, W., Fan, C., Yan, H.
  2019; 11 (15): 13874–80
- **The Chaperonin TRiC/CCT Associates with Prefoldin through a Conserved Electrostatic Interface Essential for Cellular Proteostasis.** *Cell*
  Gestaut, D., Roh, S. H., Ma, B., Pintilie, G., Joachimiak, L. A., Leitner, A., Walzthoeni, T., Aebersold, R., Chiu, W., Frydman, J.
  2019
- **Cryo-EM structures of Helicobacter pylori vacuolating cytotoxin A oligomeric assemblies at near-atomic resolution.** *Proceedings of the National Academy of Sciences of the United States of America*
  Zhang, K., Zhang, H., Li, S., Pintilie, G. D., Mou, T., Gao, Y., Zhang, Q., van den Bedem, H., Schmid, M. F., Au, S. W., Chiu, W.
  2019
- **Structure of Calcarisporiella thermophila Hsp104 Disaggregase that Antagonizes Diverse Proteotoxic Misfolding Events** *STRUCTURE*
  Michalska, K., Zhang, K., March, Z. M., Hatzos-Skintges, C., Pintilie, G., Bigelow, L., Castellano, L. M., Miles, L. J., Jackrel, M. E., Chuang, E., Jedrzejczak, R., Shorter, J., Chiu, et al
  2019; 27 (3): 449-+
- **Coupling of ssRNA cleavage with DNase activity in type III-A CRISPR-Csm revealed by cryo-EM and biochemistry.** *Cell research*
  Guo, M., Zhang, K., Zhu, Y., Pintilie, G. D., Guan, X., Li, S., Schmid, M. F., Ma, Z., Chiu, W., Huang, Z.
  2019
- **Outcomes of the Cryo-EM Map and Model Challenges**
  Lawson, C. L., Kryshtafovych, A., Pintilie, G., Berman, H. M., Chiu, W.
  CELL PRESS.2019: 160A
- **Automated Sequence Design of 3D Polyhedral Wireframe DNA Origami with Honeycomb Edges** *ACS NANO*
  Jun, H., Shepherd, T. R., Zhang, K., Bricker, W. P., Li, S., Chiu, W., Bathe, M.
  2019; 13 (2): 2083–93
- **Cryo-EM structure of a 40 kDa SAM-IV riboswitch RNA at 3.7 Å resolution** *Nat Commun*
  Zhang, K., Li, S., Kappel, K., Pintilie, G., Su, Z., Mou, T., Schmid, M. F., Das, R., Chiu, W.
  2019; 10 (1): 5511
- **Evolving Data Standards for cryo Electron Microscopy**
  Lawson, C. L., Kryshtafovych, A., Pintilie, G., Berman, H. M., Chiu, W.
  INT UNION CRYSTALLOGRAPHY.2019: A68
- **Quantifying the Resolvability in Cryo-EM Structures**
  Chiu, W., Pintilie, G.
  INT UNION CRYSTALLOGRAPHY.2019: A353
- **Photo-controlled release of paclitaxel and model drugs from RNA pyramids.** *Nano research*
  Xu, C., Li, H., Zhang, K., Binzel, D. W., Yin, H., Chiu, W., Guo, P.
  2019; 12 (1): 41-48

- **Structures of TRPV2 in distinct conformations provide insight into role of the pore turret** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
  Dosey, T. L., Wang, Z., Fan, G., Zhang, Z., Serysheva, I. I., Chiu, W., Wensel, T. G.
  2019; 26 (1): 40-+
- **NANOSCALE ELUCIDATION OF THE INVASION APPARATUS OF APICOMPLEXAN PARASITES**
  Segev-Zarko, L., Sun, S. Y., Dahlberg, P. D., Pelt, D., Chen, J., Schmid, M. F., Galaz-Montoya, J., Moerner, W. E., Larabell, C., Sethian, J., Chiu, W., Boothroyd, J.
  AMER SOC TROP MED & HYGIENE.2019: 620
- **Assessment of structural features in Cryo-EM density maps using SSE and side chain Z-scores** *JOURNAL OF STRUCTURAL BIOLOGY*
  Pintilie, G., Chiu, W.
  2018; 204 (3): 564–71
- **Comparing cryo-EM structures** *JOURNAL OF STRUCTURAL BIOLOGY*
  Lawson, C. L., Chiu, W.
  2018; 204 (3): 523–26
- **Purification of AcrAB-TolC Multidrug Efflux Pump for Cryo-EM Analysis.** *Methods in molecular biology (Clifton, N.J.)*
  Du, D., Wang, Z., Chiu, W., Luisi, B. F.
  2018; 1700: 71-81
- **Structure of Calcarisporiella thermophila Hsp104 Disaggregase that Antagonizes Diverse Proteotoxic Misfolding Events.** *Structure (London, England : 1993)*
  Michalska, K., Zhang, K., March, Z. M., Hatzos-Skintges, C., Pintilie, G., Bigelow, L., Castellano, L. M., Miles, L. J., Jackrel, M. E., Chuang, E., Jedrzejczak, R., Shorter, J., Chiu, et al
  2018
- **Programming molecular topologies from single-stranded nucleic acids.** *Nature communications*
  Qi, X., Zhang, F., Su, Z., Jiang, S., Han, D., Ding, B., Liu, Y., Chiu, W., Yin, P., Yan, H.
  2018; 9 (1): 4579
- **The first single particle analysis Map Challenge: A summary of the assessments** *JOURNAL OF STRUCTURAL BIOLOGY*
  Heymann, J., Marabini, R., Kazemi, M., Sorzano, C. S., Holmdahl, M., Mendez, J. H., Stagg, S. M., Jonic, S., Palovcak, E., Armache, J., Zhao, J., Cheng, Y., Pintilie, et al
  2018; 204 (2): 291–300
- **Visualizing Individual RuBisCO and Its Assembly into Carboxysomes in Marine Cyanobacteria by Cryo-Electron Tomography** *JOURNAL OF MOLECULAR BIOLOGY*
  Dai, W., Chen, M., Myers, C., Ludtke, S. J., Pettitt, B., King, J. A., Schmid, M. F., Chiu, W.
  2018; 430 (21): 4156–67
- **Evaluation system and web infrastructure for the second cryo-EM model challenge** *JOURNAL OF STRUCTURAL BIOLOGY*
  Kryshtafovych, A., Adams, P. D., Lawson, C. L., Chiu, W.
  2018; 204 (1): 96–108
- **Distribution of evaluation scores for the models submitted to the second cryo-EM model challenge** *DATA IN BRIEF*
  Kryshtafovych, A., Monastyrskyy, B., Adams, P. D., Lawson, C. L., Chiu, W.
  2018; 20: 1629–38
- **Machining protein microcrystals for structure determination by electron diffraction** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Duyvesteyn, H. M. E., Kotecha, A., Ginn, H. M., Hecksel, C. W., Beale, E. V., de Haas, F., Evans, G., Zhang, P., Chiu, W., Stuart, D. I.
  2018; 115 (38): 9569–73
- **Neutralizing Antibodies Inhibit Chikungunya Virus Budding at the Plasma Membrane** *CELL HOST & MICROBE*
  Jin, J., Galaz-Montoya, J. G., Sherman, M. B., Sun, S. Y., Goldsmith, C. S., O'Toole, E. T., Ackerman, L., Carlson, L., Weaver, S. C., Chiu, W., Simmons, G.
  2018; 24 (3): 417-+
- **Evaluation of models in the 2016 Cryo-EM Model Challenge**
  Kryshtafovych, A., Lawson, C. L., Chiu, W.

INT UNION CRYSTALLOGRAPHY.2018: A123

- **Flagellum couples cell shape to motility in Trypanosoma brucei.** *Proceedings of the National Academy of Sciences of the United States of America*
  Sun, S. Y., Kaelber, J. T., Chen, M., Dong, X., Nematbakhsh, Y., Shi, J., Dougherty, M., Lim, C. T., Schmid, M. F., Chiu, W., He, C. Y.
  2018; 115 (26): E5916–E5925

- **Novel Insect-Specific Eilat Virus-Based Chimeric Vaccine Candidates Provide Durable, Mono- and Multivalent, Single-Dose Protection against Lethal Alphavirus Challenge.** *Journal of virology*
  Erasmus, J. H., Seymour, R. L., Kaelber, J. T., Kim, D. Y., Leal, G., Sherman, M. B., Frolov, I., Chiu, W., Weaver, S. C., Nasar, F.
  2018; 92 (4)

- **Electron Cryo-microscopy Structure of Ebola Virus Nucleoprotein Reveals a Mechanism for Nucleocapsid-like Assembly** *Cell*
  Su, Z., et al
  2018; 172 (5): 966-978

- **The 3.5-A CryoEM Structure of Nanodisc-Reconstituted Yeast Vacuolar ATPase Vo Proton Channel.** *Mol Cell*
  Roh, S. H., Stam, N. J., Hryc, C. F., Couoh-Cardel, S., Pintilie, G., Chiu, W., Wilkens, S.
  2018; 69 (6): 993-1004

- **Structure of the 30 kDa HIV-1 RNA Dimerization Signal by a Hybrid Cryo-EM, NMR, and Molecular Dynamics Approach** *Structure of the 30 kDa HIV-1 RNA Dimerization Signal by a Hybrid Cryo-EM, NMR, and Molecular Dynamics Approach*
  Zhang, K., keane, S. C., Su, Z., robalieva, R., Chen, M., Sciandra, C. A., Marchant, J., Heng, X., Schmid, M. F., Case, D. A., Ludtke, S. J., Summers, M. F., Chiu, et al
  2018; 26 (3): 490-498

- **Programmable Supra-Assembly of a DNA Surface Adapter for Tunable Chiral Directional Self-Assembly of Gold Nanorods.** *Angewandte Chemie (International ed. in English)*
  Lan, X., Su, Z., Zhou, Y., Meyer, T., Ke, Y., Wang, Q., Chiu, W., Liu, N., Zou, S., Yan, H., Liu, Y.
  2017; 56 (46): 14632-14636

- **Editorial overview: Cryo Electron Microscopy: Exciting advances in CryoEM Herald a new era in structural biology** *CURRENT OPINION IN STRUCTURAL BIOLOGY*
  Chiu, W., Downing, K. H.
  2017; 46: IV-VIII

- **Convolutional neural networks for automated annotation of cellular cryo-electron tomograms.** *Nature methods*
  Chen, M., Dai, W., Sun, S. Y., Jonasch, D., He, C. Y., Schmid, M. F., Chiu, W., Ludtke, S. J.
  2017; 14 (10): 983-985

- **Electron Cryomicroscopy of Viruses at Near-Atomic Resolutions.** *Annual review of virology*
  Kaelber, J. T., Hryc, C. F., Chiu, W.
  2017; 4 (1): 287-308

- **Structural and Functional Impacts of ER Coactivator Sequential Recruitment.** *Molecular cell*
  Yi, P., Wang, Z., Feng, Q., Chou, C. K., Pintilie, G. D., Shen, H., Foulds, C. E., Fan, G., Serysheva, I., Ludtke, S. J., Schmid, M. F., Hung, M. C., Chiu, et al
  2017; 67 (5): 733-743.e4

- **GENFIRE: A generalized Fourier iterative reconstruction algorithm for high-resolution 3D imaging** *SCIENTIFIC REPORTS*
  Pryor, A., Yang, Y., Rana, A., Gallagher-Jones, M., Zhou, J., Lo, Y., Melinte, G., Chiu, W., Rodriguez, J. A., Miao, J.
  2017; 7: 10409

- **Subunit conformational variation within individual GroEL oligomers resolved by Cryo-EM.** *Proceedings of the National Academy of Sciences of the United States of America*
  Roh, S. H., Hryc, C. F., Jeong, H. H., Fei, X., Jakana, J., Lorimer, G. H., Chiu, W.
  2017; 114 (31): 8259-8264

- **Influence of DNA sequence on the structure of minicircles under torsional stress.** *Nucleic acids research*
  Wang, Q., Irobalieva, R. N., Chiu, W., Schmid, M. F., Fogg, J. M., Zechiedrich, L., Pettitt, B. M.
  2017; 45 (13): 7633-7642

- **SuRVoS: Super-Region Volume Segmentation workbench** *JOURNAL OF STRUCTURAL BIOLOGY*
  Luengo, I., Darrow, M. C., Spink, M. C., Sun, Y., Dai, W., He, C. Y., Chiu, W., Pridmore, T., Ashton, A. W., Duke, E. M., Basham, M., French, A. P.
  2017; 198 (1): 43-53
- **Responses to 'Atomic resolution': a badly abused term in structural biology** *ACTA CRYSTALLOGRAPHICA SECTION D-STRUCTURAL BIOLOGY*
  Chiu, W., Holton, J., Langan, P., Sauter, N. K., Schlichting, I., Terwilliger, T., Martin, J. L., Read, R. J., Wakatsuki, S.
  2017; 73: 381-383
- **An allosteric transport mechanism for the AcrAB-TolC multidrug efflux pump** *ELIFE*
  Wang, Z., Fan, G., Hryc, C. F., Blaza, J. N., Serysheva, I. I., Schmid, M. F., Chiu, W., Luisi, B. F., Du, D.
  2017; 6
- **Accurate model annotation of a near-atomic resolution cryo-EM map** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Hryc, C. F., Chen, D., Afonine, P. V., Jakana, J., Wang, Z., Haase-Pettingell, C., Jiang, W., Adams, P. D., King, J. A., Schmid, M. F., Chiu, W.
  2017; 114 (12): 3103-3108
- **Visualizing Adsorption of Cyanophage P-SSP7 onto Marine Prochlorococcus** *SCIENTIFIC REPORTS*
  Murata, K., Zhang, Q., Galaz-Montoya, J. G., Fu, C., Coleman, M. L., Osburne, M. S., Schmid, M. F., Sullivan, M. B., Chisholm, S. W., Chiu, W.
  2017; 7
- **A chikungunya fever vaccine utilizing an insect-specific virus platform.** *Nature medicine*
  Erasmus, J. H., Auguste, A. J., Kaelber, J. T., Luo, H., Rossi, S. L., Fenton, K., Leal, G., Kim, D. Y., Chiu, W., Wang, T., Frolov, I., Nasar, F., Weaver, et al
  2017; 23 (2): 192-199
- **Subunit conformational variation within individual GroEL oligomers resolved by Cryo-EM** *Proc Natl Acad Sci U S A*
  Roh, S. H., Hryc, C. F., Jeong, H. H., Fei, H. H., Jakana, J., Lorimer, G. H., Chiu, W.
  2017; 114 (31): 8259-8264
- **Fabrication of RNA 3D Nanoprisms for Loading and Protection of Small RNAs and Model Drugs** *ADVANCED MATERIALS*
  Khisamutdinov, E. F., Jasinski, D. L., Li, H., Zhang, K., Chiu, W., Guo, P.
  2016; 28 (45): 10079–87
- **Control of the structural landscape and neuronal proteotoxicity of mutant Huntingtin by domains flanking the polyQ tract.** *eLife*
  Shen, K., Calamini, B., Fauerbach, J. A., Ma, B., Shahmoradian, S. H., Serrano Lachapel, I. L., Chiu, W., Lo, D. C., Frydman, J.
  2016; 5
- **TRiC subunits enhance BDNF axonal transport and rescue striatal atrophy in Huntington's disease.** *Proceedings of the National Academy of Sciences of the United States of America*
  Zhao, X., Chen, X. Q., Han, E., Hu, Y., Paik, P., Ding, Z., Overman, J., Lau, A. L., Shahmoradian, S. H., Chiu, W., Thompson, L. M., Wu, C., Mobley, et al
  2016; 113 (38): E5655-64
- **Visualizing red blood cell sickling and the effects of inhibition of sphingosine kinase 1 using soft X-ray tomography.** *Journal of cell science*
  Darrow, M. C., Zhang, Y., Cinquin, B. P., Smith, E. A., Boudreau, R., Rochat, R. H., Schmid, M. F., Xia, Y., Larabell, C. A., Chiu, W.
  2016; 129 (18): 3511-7
- **Controllable Self-Assembly of RNA Tetrahedrons with Precise Shape and Size for Cancer Targeting** *ADVANCED MATERIALS*
  Li, H., Zhang, K., Pi, F., Guo, S., Shlyakhtenko, L., Chiu, W., Shu, D., Guo, P.
  2016; 28 (34): 7501–7
- **DNA NANOTECHNOLOGY Designer nanoscale DNA assemblies programmed from the top down** *SCIENCE*
  Veneziano, R., Ratanalert, S., Zhang, K., Zhang, F., Yan, H., Chiu, W., Bathe, M.
  2016; 352 (6293): 1534
- **The Electron Microscopy eXchange (EMX) initiative.** *Journal of structural biology*
  Marabini, R., Ludtke, S. J., Murray, S. C., Chiu, W., de la Rosa-Trevín, J. M., Patwardhan, A., Heymann, J. B., Carazo, J. M.
  2016; 194 (2): 156-63

- **Resolution and Probabilistic Models of Components in CryoEM Maps of Mature P22 Bacteriophage** *BIOPHYSICAL JOURNAL*
  Pintilie, G., Chen, D., Haase-Pettingell, C. A., King, J. A., Chiu, W.
  2016; 110 (4): 827-839

- **EMDataBank unified data resource for 3DEM.** *Nucleic acids research*
  Lawson, C. L., Patwardhan, A., Baker, M. L., Hryc, C., Garcia, E. S., Hudson, B. P., Lagerstedt, I., Ludtke, S. J., Pintilie, G., Sala, R., Westbrook, J. D., Berman, H. M., Kleywegt, et al
  2016; 44 (D1): D396-403

- **Chaperonin TRiC/CCT Recognizes Fusion Oncoprotein AML1-ETO through Subunit-Specific Interactions.** *Biophysical journal*
  Roh, S. H., Kasembeli, M. M., Galaz-Montoya, J. G., Chiu, W. n., Tweardy, D. J.
  2016; 110 (11): 2377–85

- **Quantifying Variability of Manual Annotation in Cryo-Electron Tomograms.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Hecksel, C. W., Darrow, M. C., Dai, W. n., Galaz-Montoya, J. G., Chin, J. A., Mitchell, P. G., Chen, S. n., Jakana, J. n., Schmid, M. F., Chiu, W. n.
  2016; 22 (3): 487–96

- **Chaperonin TRiC/CCT Modulates the Folding and Activity of Leukemogenic Fusion Oncoprotein AML1-ETO.** *The Journal of biological chemistry*
  Roh, S. H., Kasembeli, M. n., Galaz-Montoya, J. G., Trnka, M. n., Lau, W. C., Burlingame, A. n., Chiu, W. n., Tweardy, D. J.
  2016; 291 (9): 4732–41

- **Alignment algorithms and per-particle CTF correction for single particle cryo-electron tomography.** *Journal of structural biology*
  Galaz-Montoya, J. G., Hecksel, C. W., Baldwin, P. R., Wang, E. n., Weaver, S. C., Schmid, M. F., Ludtke, S. J., Chiu, W. n.
  2016; 194 (3): 383–94

- **Improved Peak Detection and Deconvolution of Native Electrospray Mass Spectra from Large Protein Complexes** *JOURNAL OF THE AMERICAN SOCIETY FOR MASS SPECTROMETRY*
  Lu, J., Trnka, M. J., Roh, S., Robinson, P. J., Shiau, C., Fujimori, D. G., Chiu, W., Burlingame, A. L., Guan, S.
  2015; 26 (12): 2141-2151

- **Electron cryotomography reveals ultrastructure alterations in platelets from patients with ovarian cancer.** *Proceedings of the National Academy of Sciences of the United States of America*
  Wang, R., Stone, R. L., Kaelber, J. T., Rochat, R. H., Nick, A. M., Vijayan, K. V., Afshar-Kharghan, V., Schmid, M. F., Dong, J. F., Sood, A. K., Chiu, W.
  2015; 112 (46): 14266-71

- **Contribution of the Type II Chaperonin, TRiC/CCT, to Oncogenesis.** *International journal of molecular sciences*
  Roh, S. H., Kasembeli, M., Bakthavatsalam, D., Chiu, W., Tweardy, D. J.
  2015; 16 (11): 26706-20

- **Structural diversity of supercoiled DNA.** *Nature communications*
  Irobalieva, R. N., Fogg, J. M., Catanese, D. J., Sutthibutpong, T., Chen, M., Barker, A. K., Ludtke, S. J., Harris, S. A., Schmid, M. F., Chiu, W., Zechiedrich, L.
  2015; 6: 8440

- **Outcome of the First wwPDB Hybrid/Integrative Methods Task Force Workshop** *STRUCTURE*
  Sali, A., Berman, H. M., Schwede, T., Trewhella, J., Kleywegt, G., Burley, S. K., Markley, J., Nakamura, H., Adams, P., Bonvin, A. M., Chiu, W., Dal Peraro, M., Di Maio, et al
  2015; 23 (7): 1156-1167

- **CTF Challenge: Result summary** *JOURNAL OF STRUCTURAL BIOLOGY*
  Marabini, R., Carragher, B., Chen, S., Chen, J., Cheng, A., Downing, K. H., Frank, J., Grassucci, R. A., Heymann, J. B., Jiang, W., Jonic, S., Liao, H. Y., Ludtke, et al
  2015; 190 (3): 348-359

- **An Intrinsically Disordered Peptide from Ebola Virus VP35 Controls Viral RNA Synthesis by Modulating Nucleoprotein-RNA Interactions.** *Cell reports*
  Leung, D. W., Borek, D., Luthra, P., Binning, J. M., Anantpadma, M., Liu, G., Harvey, I. B., Su, Z., Endlich-Frazier, A., Pan, J., Shabman, R. S., Chiu, W., Davey, et al

2015; 11 (3): 376-89

- **Structure of a biologically active estrogen receptor-coactivator complex on DNA.** *Molecular cell*
  Yi, P., Wang, Z., Feng, Q., Pintilie, G. D., Foulds, C. E., Lanz, R. B., Ludtke, S. J., Schmid, M. F., Chiu, W., O'Malley, B. W.
  2015; 57 (6): 1047-1058

- **Lemon-shaped halo archaeal virus His1 with uniform tail but variable capsid structure.** *Proceedings of the National Academy of Sciences of the United States of America*
  Hong, C., Pietilä, M. K., Fu, C. J., Schmid, M. F., Bamford, D. H., Chiu, W.
  2015; 112 (8): 2449-54

- **Structural Mechanisms of Mutant Huntingtin Aggregation Suppression by the Synthetic Chaperonin-like CCT5 Complex Explained by Cryoelectron Tomography.** *The Journal of biological chemistry*
  Darrow, M. C., Sergeeva, O. A., Isas, J. M., Galaz-Montoya, J. G., King, J. A., Langen, R. n., Schmid, M. F., Chiu, W. n.
  2015; 290 (28): 17451–61

- **A newly isolated reovirus has the simplest genomic and structural organization of any reovirus.** *Journal of virology*
  Auguste, A. J., Kaelber, J. T., Fokam, E. B., Guzman, H., Carrington, C. V., Erasmus, J. H., Kamgang, B., Popov, V. L., Jakana, J., Liu, X., Wood, T. G., Widen, S. G., Vasilakis, et al
  2015; 89 (1): 676-87

- **A structural model of the genome packaging process in a membrane-containing double stranded DNA virus.** *PLoS biology*
  Hong, C., Oksanen, H. M., Liu, X., Jakana, J., Bamford, D. H., Chiu, W.
  2014; 12 (12): e1002024

- **Zernike phase-contrast electron cryotomography applied to marine cyanobacteria infected with cyanophages.** *Nature protocols*
  Dai, W., Fu, C., Khant, H. A., Ludtke, S. J., Schmid, M. F., Chiu, W.
  2014; 9 (11): 2630-42

- **Capsid expansion mechanism of bacteriophage T7 revealed by multistate atomic models derived from cryo-EM reconstructions.** *Proceedings of the National Academy of Sciences of the United States of America*
  Guo, F., Liu, Z., Fang, P. A., Zhang, Q., Wright, E. T., Wu, W., Zhang, C., Vago, F., Ren, Y., Jakana, J., Chiu, W., Serwer, P., Jiang, et al
  2014; 111 (43): E4606-14

- **A 3D cellular context for the macromolecular world.** *Nature structural & molecular biology*
  Patwardhan, A., Ashton, A., Brandt, R., Butcher, S., Carzaniga, R., Chiu, W., Collinson, L., Doux, P., Duke, E., Ellisman, M. H., Franken, E., Grünewald, K., Heriche, et al
  2014; 21 (10): 841-5

- **Crystal structure of a nematode-infecting virus.** *Proceedings of the National Academy of Sciences of the United States of America*
  Guo, Y. R., Hryc, C. F., Jakana, J., Jiang, H., Wang, D., Chiu, W., Zhong, W., Tao, Y. J.
  2014; 111 (35): 12781-6

- **An atomic model of brome mosaic virus using direct electron detection and real-space optimization** *NATURE COMMUNICATIONS*
  Wang, Z., Hryc, C. F., Bammes, B., Afonine, P. V., Jakana, J., Chen, D., Liu, X., Baker, M. L., Kao, C., Ludtke, S. J., Schmid, M. F., Adams, P. D., Chiu, et al
  2014; 5

- **Protruding knob-like proteins violate local symmetries in an icosahedral marine virus.** *Nature communications*
  Gipson, P., Baker, M. L., Raytcheva, D., Haase-Pettingell, C., Piret, J., King, J. A., Chiu, W.
  2014; 5: 4278

- **Chaperonin-containing TCP-1 complex directly binds to the cytoplasmic domain of the LOX-1 receptor.** *FEBS letters*
  Bakthavatsalam, D., Soung, R. H., Tweardy, D. J., Chiu, W., Dixon, R. A., Woodside, D. G.
  2014; 588 (13): 2133-40

- **Multiple functional roles of the accessory I-domain of bacteriophage P22 coat protein revealed by NMR structure and CryoEM modeling.** *Structure (London, England : 1993)*
  Rizzo, A. A., Suhanovsky, M. M., Baker, M. L., Fraser, L. C., Jones, L. M., Rempel, D. L., Gross, M. L., Chiu, W., Alexandrescu, A. T., Teschke, C. M.
  2014; 22 (6): 830-41

- **Identifying the assembly pathway of cyanophage inside the marine bacterium using electron cryo-tomography.** *Microbial cell (Graz, Austria)*
  Dai, W., Schmid, M. F., King, J. A., Chiu, W.
  2014; 1 (1): 45-47
- **Structure of the AcrAB-TolC multidrug efflux pump.** *Nature*
  Du, D., Wang, Z., James, N. R., Voss, J. E., Klimont, E., Ohene-Agyei, T., Venter, H., Chiu, W., Luisi, B. F.
  2014; 509 (7501): 512-5
- **Modulation of STAT3 folding and function by TRiC/CCT chaperonin.** *PLoS biology*
  Kasembeli, M., Lau, W. C., Roh, S., Eckols, T. K., Frydman, J., Chiu, W., Tweardy, D. J.
  2014; 12 (4)
- **Editorial overview: virus structure and function.** *Current opinion in virology*
  Chiu, W., Crépin, T., Ruigrok, R. W.
  2014; 5: viii-ix
- **Cryo-EM techniques to resolve the structure of HSV-1 capsid-associated components.** *Methods in molecular biology (Clifton, N.J.)*
  Rochat, R. H., Hecksel, C. W., Chiu, W.
  2014; 1144: 265-81
- **Preparation of primary neurons for visualizing neurites in a frozen-hydrated state using cryo-electron tomography.** *Journal of visualized experiments : JoVE*
  Shahmoradian, S. H., Galiano, M. R., Wu, C., Chen, S., Rasband, M. N., Mobley, W. C., Chiu, W.
  2014: e50783
- **Validated near-atomic resolution structure of bacteriophage epsilon15 derived from cryo-EM and modeling** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Baker, M. L., Hryc, C. F., Zhang, Q., Wu, W., Jakana, J., Haase-Pettingell, C., Afonine, P. V., Adams, P. D., King, J. A., Jiang, W., Chiu, W.
  2013; 110 (30): 12301-12306
- **TRiC's tricks inhibit huntingtin aggregation** *ELIFE*
  Shahmoradian, S. H., Galaz-Montoya, J. G., Schmid, M. F., Cong, Y., Ma, B., Spiess, C., Frydman, J., Ludtke, S. J., Chiu, W.
  2013; 2
- **Visualizing GroEL/ES in the act of encapsulating a folding protein.** *Cell*
  Chen, D. H., Madan, D., Weaver, J., Lin, Z., Schröder, G. F., Chiu, W., Rye, H. S.
  2013; 153 (6): 1354-65
- **Validation of cryo-EM structure of IP#R1 channel.** *Structure (London, England : 1993)*
  Murray, S. C., Flanagan, J., Popova, O. B., Chiu, W., Ludtke, S. J., Serysheva, I. I.
  2013; 21 (6): 900-9
- **Cryo-EM model validation using independent map reconstructions.** *Protein science*
  DiMaio, F., Zhang, J., Chiu, W., Baker, D.
  2013; 22 (6): 865-868
- **EMEN2: an object oriented database and electronic lab notebook.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Rees, I., Langley, E., Chiu, W., Ludtke, S. J.
  2013; 19 (1): 1-10
- **TRiC's tricks inhibit huntingtin aggregation.** *eLife*
  Shahmoradian, S. H., Galaz-Montoya, J. G., Schmid, M. F., Cong, Y., Ma, B., Spiess, C., Frydman, J., Ludtke, S. J., Chiu, W.
  2013; 2
- **Three-dimensional architecture of the rod sensory cilium and its disruption in retinal neurodegeneration.** *Cell*
  Gilliam, J. C., Chang, J. T., Sandoval, I. M., Zhang, Y., Li, T., Pittler, S. J., Chiu, W., Wensel, T. G.
  2012; 151 (5): 1029-41
- **A tail-like assembly at the portal vertex in intact herpes simplex type-1 virions.** *PLoS pathogens*

Schmid, M. F., Hecksel, C. W., Rochat, R. H., Bhella, D., Chiu, W., Rixon, F. J.
2012; 8 (10): e1002961

- **Comparison of Segger and other methods for segmentation and rigid-body docking of molecular components in cryo-EM density maps.** *Biopolymers*
  Pintilie, G., Chiu, W.
  2012; 97 (9): 742-60
- **Gorgon and pathwalking: macromolecular modeling tools for subnanometer resolution density maps.** *Biopolymers*
  Baker, M. L., Baker, M. R., Hryc, C. F., Ju, T., Chiu, W.
  2012; 97 (9): 655-68
- **The Molecular Architecture of the Eukaryotic Chaperonin TRiC/CCT** *STRUCTURE*
  Leitner, A., Joachimiak, L. A., Bracher, A., Moenkemeyer, L., Walzthoeni, T., Chen, B., Pechmann, S., Holmes, S., Cong, Y., Ma, B., Ludtke, S., Chiu, W., Hartl, et al
  2012; 20 (5): 814-825
- **Constructing and validating initial Cα models from subnanometer resolution density maps with pathwalking.** *Structure (London, England : 1993)*
  Baker, M. R., Rees, I., Ludtke, S. J., Chiu, W., Baker, M. L.
  2012; 20 (3): 450-63
- **Direct electron detection yields cryo-EM reconstructions at resolutions beyond 3/4 Nyquist frequency.** *Journal of structural biology*
  Bammes, B. E., Rochat, R. H., Jakana, J., Chen, D. H., Chiu, W.
  2012; 177 (3): 589-601
- **Reconstructing virus structures from nanometer to near-atomic resolutions with cryo-electron microscopy and tomography.** *Advances in experimental medicine and biology*
  Chang, J., Liu, X., Rochat, R. H., Baker, M. L., Chiu, W.
  2012; 726: 49-90
- **Symmetry-free cryo-EM structures of the chaperonin TRiC along its ATPase-driven conformational cycle** *EMBO JOURNAL*
  Cong, Y., Schroeder, G. F., Meyer, A. S., Jakana, J., Ma, B., Dougherty, M. T., Schmid, M. F., Reissmann, S., Levitt, M., Ludtke, S. L., Frydman, J., Chiu, W.
  2012; 31 (3): 720-730
- **Workshop on the validation and modeling of electron cryo-microscopy structures of biological nanomachines.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
  Ludtke, S. J., Lawson, C. L., Kleywegt, G. J., Berman, H. M., Chiu, W.
  2011: 369-73
- **Practical performance evaluation of a 10k × 10k CCD for electron cryo-microscopy.** *Journal of structural biology*
  Bammes, B. E., Rochat, R. H., Jakana, J., Chiu, W.
  2011; 175 (3): 384-93
- **Flexible architecture of IP3R1 by Cryo-EM.** *Structure (London, England : 1993)*
  Ludtke, S. J., Tran, T. P., Ngo, Q. T., Moiseenkova-Bell, V. Y., Chiu, W., Serysheva, I. I.
  2011; 19 (8): 1192-9
- **4.4 Å cryo-EM structure of an enveloped alphavirus Venezuelan equine encephalitis virus.** *The EMBO journal*
  Zhang, R., Hryc, C. F., Cong, Y., Liu, X., Jakana, J., Gorchakov, R., Baker, M. L., Weaver, S. C., Chiu, W.
  2011; 30 (18): 3854-63
- **Near-atomic-resolution cryo-EM for molecular virology.** *Current opinion in virology*
  Hryc, C. F., Chen, D. H., Chiu, W.
  2011; 1 (2): 110-7
- **Structure of Trypanosoma brucei flagellum accounts for its bihelical motion.** *Proceedings of the National Academy of Sciences of the United States of America*
  Koyfman, A. Y., Schmid, M. F., Gheiratmand, L., Fu, C. J., Khant, H. A., Huang, D., He, C. Y., Chiu, W.
  2011; 108 (27): 11105-8

- **Cryo-EM Structure of a Group II Chaperonin in the Prehydrolysis ATP-Bound State Leading to Lid Closure** *STRUCTURE*
  Zhang, J., Ma, B., DiMaio, F., Douglas, N. R., Joachimiak, L. A., Baker, D., Frydman, J., Levitt, M., Chiu, W.
  2011; 19 (5): 633-639
- **Modeling protein structure at near atomic resolutions with Gorgon.** *Journal of structural biology*
  Baker, M. L., Abeysinghe, S. S., Schuh, S., Coleman, R. A., Abrams, A., Marsh, M. P., Hryc, C. F., Ruths, T., Chiu, W., Ju, T.
  2011; 174 (2): 360-73
- **Structural basis for scaffolding-mediated assembly and maturation of a dsDNA virus** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Chen, D., Baker, M. L., Hryc, C. F., DiMaio, F., Jakana, J., Wu, W., Dougherty, M., Haase-Pettingell, C., Schmid, M. F., Jiang, W., Baker, D., King, J. A., Chiu, et al
  2011; 108 (4): 1355-1360
- **Dual Action of ATP Hydrolysis Couples Lid Closure to Substrate Release into the Group II Chaperonin Chamber** *CELL*
  Douglas, N. R., Reissmann, S., Zhang, J., Chen, B., Jakana, J., Kumar, R., Chiu, W., Frydman, J.
  2011; 144 (2): 240-252
- **Workshop on molecular animation.** *Structure (London, England : 1993)*
  Bromberg, S., Chiu, W., Ferrin, T. E.
  2010; 18 (10): 1261-5
- **Visualizing the structural changes of bacteriophage Epsilon15 and its Salmonella host during infection.** *Journal of molecular biology*
  Chang, J. T., Schmid, M. F., Haase-Pettingell, C., Weigele, P. R., King, J. A., Chiu, W.
  2010; 402 (4): 731-40
- **Zernike phase contrast cryo-electron microscopy and tomography for structure determination at nanometer and subnanometer resolutions.** *Structure (London, England : 1993)*
  Murata, K., Liu, X., Danev, R., Jakana, J., Schmid, M. F., King, J., Nagayama, K., Chiu, W.
  2010; 18 (8): 903-12
- **Structural changes in a marine podovirus associated with release of its genome into Prochlorococcus.** *Nature structural & molecular biology*
  Liu, X., Zhang, Q., Murata, K., Baker, M. L., Sullivan, M. B., Fu, C., Dougherty, M. T., Schmid, M. F., Osburne, M. S., Chisholm, S. W., Chiu, W.
  2010; 17 (7): 830-6
- **MOTIF-EM: an automated computational tool for identifying conserved regions in CryoEM structures** *BIOINFORMATICS*
  Saha, M., Levitt, M., Chiu, W.
  2010; 26 (12): i301-i309
- **4.0 angstrom Resolution Cryo-EM Structure of the Mammalian Chaperonin TRiC/CCT Reveals its Unique Subunit Arrangement**
  Cong, Y., Baker, M. L., Jakana, J., Woolford, D., Miller, E. J., Reissmann, S., Kumar, R. N., Redding-Johanson, A. M., Batth, T. S., Mukhopadhyay, A., Ludtke, S. J., Frydman, J., Chiu, et al
  FEDERATION AMER SOC EXP BIOL.2010
- **4.0-angstrom resolution cryo-EM structure of the mammalian chaperonin TRiC/CCT reveals its unique subunit arrangement** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Cong, Y., Baker, M. L., Jakana, J., Woolford, D., Miller, E. J., Reissmann, S., Kumar, R. N., Redding-Johanson, A. M., Batth, T. S., Mukhopadhyay, A., Ludtke, S. J., Frydman, J., Chiu, et al
  2010; 107 (11): 4967-4972
- **Radiation damage effects at four specimen temperatures from 4 to 100 K.** *Journal of structural biology*
  Bammes, B. E., Jakana, J., Schmid, M. F., Chiu, W.
  2010; 169 (3): 331-41
- **4.0 angstrom Cryo-EM Structure of the Mammalian Chaperonin: TRiC/CCT**
  Cong, Y., Baker, M., Jakana, J., Woolford, D., Reissmann, S., Ludtke, S. J., Frydman, J., Chiu, W.
  CELL PRESS.2010: 222A–223A
- **Cryo-EM of macromolecular assemblies at near-atomic resolution** *NATURE PROTOCOLS*
  Baker, M. L., Zhang, J., Ludtke, S. J., Chiu, W.

2010; 5 (10): 1697-1708

- **Rocking Motion of a Protein-Folding Nano-Machine Revealed By Single-Particle Cryo-Em**
  Zhang, J., Baker, M. L., Schroeder, G., Douglas, N. R., Jakana, J., Fu, C. J., Levitt, M., Ludtke, S. J., Frydman, J., Chiu, W.
  CELL PRESS.2010: 33A
- **Conformational Change of a Group II Chaperonin in Different States Revealed by Single-particle Cryo-EM**
  Zhang, J., Baker, M. L., Schroeder, G., Douglas, N. R., Jakana, J., Fu, C. J., Levitt, M., Ludtke, S. J., Frydman, J., Chiu, W.
  ADENINE PRESS.2009: 844–44
- **Structural mechanism of SDS-induced enzyme activity of scorpion hemocyanin revealed by electron cryomicroscopy.** *Structure (London, England : 1993)*
  Cong, Y., Zhang, Q., Woolford, D., Schweikardt, T., Khant, H., Dougherty, M., Ludtke, S. J., Chiu, W., Decker, H.
  2009; 17 (5): 749-58
- **Rocking Motion of the Equatorial Domains of a Group II Chaperonin between Two Biochemical States Revealed by Single-Particle Cryo-EM at Near-atomic and Subnanometer Resolutions**
  Zhang, J., Baker, M., Schroeder, G., Douglas, N., Jakana, J., Fu, C., Levitt, M., Ludtke, S., Frydman, J., Chiu, W.
  FEDERATION AMER SOC EXP BIOL.2009
- **Conformational Changes of Eukaryotic Chaperonin TRiC/CCT in the Nucleotide Cycle Revealed by CryoEM**
  Cong, Y., Schroeder, G. F., Jakana, J., Reissmann, S., Levitt, M., Ludtke, S. J., Frydman, J., Chiu, W.
  FEDERATION AMER SOC EXP BIOL.2009
- **Interprotofilament interactions between Alzheimer's Abeta1-42 peptides in amyloid fibrils revealed by cryoEM.** *Proceedings of the National Academy of Sciences of the United States of America*
  Zhang, R., Hu, X., Khant, H., Ludtke, S. J., Chiu, W., Schmid, M. F., Frieden, C., Lee, J. M.
  2009; 106 (12): 4653-8
- **Estimating contrast transfer function and associated parameters by constrained non-linear optimization** *JOURNAL OF MICROSCOPY*
  Yang, C., Jiang, W., Chen, D., Adiga, U., Ng, E. G., Chiu, W.
  2009; 233 (3): 391-403
- **JADAS: A customizable automated data acquisition system and its application to ice-embedded single particles** *JOURNAL OF STRUCTURAL BIOLOGY*
  Zhang, J., Nakamura, N., Shimizu, Y., Liang, N., Liu, X., Jakana, J., Marsh, M. P., Booth, C. R., Shinkawa, T., Nakata, M., Chiu, W.
  2009; 165 (1): 1-9
- **Location and flexibility of the unique C-terminal tail of Aquifex aeolicus co-chaperonin protein 10 as derived by cryo-electron microscopy and biophysical techniques** *JOURNAL OF MOLECULAR BIOLOGY*
  Chen, D., Luke, K., Zhang, J., Chiu, W., Wittung-Stafshede, P.
  2008; 381 (3): 707-717
- **Subnanometer-resolution electron cryomicroscopy-based domain models for the cytoplasmic region of skeletal muscle RyR channel.** *Proceedings of the National Academy of Sciences of the United States of America*
  Serysheva, I. I., Ludtke, S. J., Baker, M. L., Cong, Y., Topf, M., Eramian, D., Sali, A., Hamilton, S. L., Chiu, W.
  2008; 105 (28): 9610-5
- **Mechanism of lid closure in the eukaryotic chaperonin TRiC/CCT** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
  Booth, C. R., Meyer, A. S., Cong, Y., Topf, M., Sali, A., Ludtke, S. J., Chiu, W., Frydman, J.
  2008; 15 (7): 746-753
- **Achievable resolution from images of biological specimens acquired from a 4k x 4k CCD camera in a 300-kV electron cryomicroscope.** *Journal of structural biology*
  Chen, D. H., Jakana, J., Liu, X., Schmid, M. F., Chiu, W.
  2008; 163 (1): 45-52
- **De novo backbone trace of GroEL from single particle electron cryomicroscopy.** *Structure (London, England : 1993)*
  Ludtke, S. J., Baker, M. L., Chen, D. H., Song, J. L., Chuang, D. T., Chiu, W.
  2008; 16 (3): 441-8

- **Crystallographic conformers of actin in a biologically active bundle of filaments.** *Journal of molecular biology*
  Cong, Y., Topf, M., Sali, A., Matsudaira, P., Dougherty, M., Chiu, W., Schmid, M. F.
  2008; 375 (2): 331-6
- **Modular software platform for low-dose electron microscopy and tomography.** *Journal of microscopy*
  Marsh, M. P., Chang, J. T., Booth, C. R., Liang, N. L., Schmid, M. F., Chiu, W.
  2007; 228 (Pt 3): 384-9
- **Averaging tens to hundreds of icosahedral particle images to resolve protein secondary structure elements using a Multi-Path Simulated Annealing optimization algorithm.** *Journal of structural biology*
  Liu, X., Jiang, W., Jakana, J., Chiu, W.
  2007; 160 (1): 11-27
- **Essential function of the built-in lid in the allosteric regulation of eukaryotic and archaeal chaperonins** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
  Reissmann, S., Parnot, C., Booth, C. R., Chiu, W., Frydman, J.
  2007; 14 (5): 432-440
- **Single-particle electron cryomicroscopy of the ion channels in the excitation-contraction coupling junction.** *Methods in cell biology*
  Serysheva, I. I., Chiu, W., Ludtke, S. J.
  2007; 79: 407-35
- **Electron cryotomography reveals the portal in the herpesvirus capsid.** *Journal of virology*
  Chang, J. T., Schmid, M. F., Rixon, F. J., Chiu, W.
  2007; 81 (4): 2065-8
- **Identification of secondary structure elements in intermediate-resolution density maps.** *Structure (London, England : 1993)*
  Baker, M. L., Ju, T., Chiu, W.
  2007; 15 (1): 7-19
- **Assessing the capabilities of a 4kx4k CCD camera for electron cryo-microscopy at 300kV.** *Journal of structural biology*
  Booth, C. R., Jakana, J., Chiu, W.
  2006; 156 (3): 556-63
- **Automated segmentation of molecular subunits in electron cryomicroscopy density maps.** *Journal of structural biology*
  Baker, M. L., Yu, Z., Chiu, W., Bajaj, C.
  2006; 156 (3): 432-41
- **Cryoelectron microscopy of protein IX-modified adenoviruses suggests a new position for the C terminus of protein IX.** *Journal of virology*
  Marsh, M. P., Campos, S. K., Baker, M. L., Chen, C. Y., Chiu, W., Barry, M. A.
  2006; 80 (23): 11881-6
- **Structure of Halothiobacillus neapolitanus carboxysomes by cryo-electron tomography.** *Journal of molecular biology*
  Schmid, M. F., Paredes, A. M., Khant, H. A., Soyer, F., Aldrich, H. C., Chiu, W., Shively, J. M.
  2006; 364 (3): 526-35
- **An expanded conformation of single-ring GroEL-GroES complex encapsulates an 86 kDa substrate.** *Structure (London, England : 1993)*
  Chen, D. H., Song, J. L., Chuang, D. T., Chiu, W., Ludtke, S. J.
  2006; 14 (11): 1711-22
- **Ab initio modeling of the herpesvirus VP26 core domain assessed by CryoEM density.** *PLoS computational biology*
  Baker, M. L., Jiang, W., Wedemeyer, W. J., Rixon, F. J., Baker, D., Chiu, W.
  2006; 2 (10): e146
- **Cryo-EM asymmetric reconstruction of bacteriophage P22 reveals organization of its DNA packaging and infecting machinery.** *Structure (London, England : 1993)*
  Chang, J., Weigele, P., King, J., Chiu, W., Jiang, W.
  2006; 14 (6): 1073-82
- **Structural biology of cellular machines.** *Trends in cell biology*

Chiu, W., Baker, M. L., Almo, S. C.
2006; 16 (3): 144-50

- **Structure of epsilon15 bacteriophage reveals genome organization and DNA packaging/injection apparatus.** *Nature*
Jiang, W., Chang, J., Jakana, J., Weigele, P., King, J., Chiu, W.
2006; 439 (7076): 612-6

- **Common ancestry of herpesviruses and tailed DNA bacteriophages.** *Journal of virology*
Baker, M. L., Jiang, W., Rixon, F. J., Chiu, W.
2005; 79 (23): 14967-70

- **A digital atlas to characterize the mouse brain transcriptome.** *PLoS computational biology*
Carson, J. P., Ju, T., Lu, H. C., Thaller, C., Xu, M., Pallas, S. L., Crair, M. C., Warren, J., Chiu, W., Eichele, G.
2005; 1 (4): e41

- **The pore structure of the closed RyR1 channel.** *Structure (London, England : 1993)*
Ludtke, S. J., Serysheva, I. I., Hamilton, S. L., Chiu, W.
2005; 13 (8): 1203-11

- **Electron cryomicroscopy of biological machines at subnanometer resolution.** *Structure (London, England : 1993)*
Chiu, W., Baker, M. L., Jiang, W., Dougherty, M., Schmid, M. F.
2005; 13 (3): 363-72

- **Structure of Ca2+ release channel at 14 A resolution.** *Journal of molecular biology*
Serysheva, I. I., Hamilton, S. L., Chiu, W., Ludtke, S. J.
2005; 345 (3): 427-31

- **Structure of the acrosomal bundle.** *Nature*
Schmid, M. F., Sherman, M. B., Matsudaira, P., Chiu, W.
2004; 431 (7004): 104-7

- **Structure of the bifunctional and Golgi-associated formiminotransferase cyclodeaminase octamer.** *The EMBO journal*
Mao, Y., Vyas, N. K., Vyas, M. N., Chen, D. H., Ludtke, S. J., Chiu, W., Quiocho, F. A.
2004; 23 (15): 2963-71

- **A 9 angstroms single particle reconstruction from CCD captured images on a 200 kV electron cryomicroscope.** *Journal of structural biology*
Booth, C. R., Jiang, W., Baker, M. L., Zhou, Z. H., Ludtke, S. J., Chiu, W.
2004; 147 (2): 116-27

- **Conformational changes in Sindbis virions resulting from exposure to low pH and interactions with cells suggest that cell penetration may occur at the cell surface in the absence of membrane fusion** *VIROLOGY*
Paredes, A. M., Ferreira, D., Horton, M., Saad, A., Tsuruta, H., Johnston, R., Klimstra, W., Ryman, K., Hernandez, R., Chiu, W., Brown, D. T.
2004; 324 (2): 373-386

- **Seeing GroEL at 6 A resolution by single particle electron cryomicroscopy.** *Structure (London, England : 1993)*
Ludtke, S. J., Chen, D. H., Song, J. L., Chuang, D. T., Chiu, W.
2004; 12 (7): 1129-36

- **Experimental verification of conformational variation of human fatty acid synthase as predicted by normal mode analysis.** *Structure (London, England : 1993)*
Brink, J., Ludtke, S. J., Kong, Y., Wakil, S. J., Ma, J., Chiu, W.
2004; 12 (2): 185-91

- **Structure of triglyceride-rich human low-density lipoproteins according to cryoelectron microscopy.** *Biochemistry*
Sherman, M. B., Orlova, E. V., Decker, G. L., Chiu, W., Pownall, H. J.
2003; 42 (50): 14988-93

- **Electron beam coater for reduction of charging in ice-embedded biological specimens using Ti(88)Si(12) alloy.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
Sherman, M. B., Chiu, W.
2003; 9 (6): 566-73

- **Object oriented database and electronic notebook for transmission electron microscopy.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Ludtke, S. J., Nason, L., Tu, H., Peng, L., Chiu, W.
  2003; 9 (6): 556-65
- **The structure of ClpB: a molecular chaperone that rescues proteins from an aggregated state.** *Cell*
  Lee, S., Sowa, M. E., Watanabe, Y. H., Sigler, P. B., Chiu, W., Yoshida, M., Tsai, F. T.
  2003; 115 (2): 229-40
- **The structure of clpB: A molecular chaperone that rescues proteins from an aggregated state** *CELL*
  Lee, S., Sowa, M. E., Watanabe, Y. H., Sigler, P. B., Chiu, W., Yoshida, M., Tsai, F. T.
  2003; 115 (2): 229-240
- **Architecture of the herpes simplex virus major capsid protein derived from structural bioinformatics.** *Journal of molecular biology*
  Baker, M. L., Jiang, W., Bowman, B. R., Zhou, Z. H., Quiocho, F. A., Rixon, F. J., Chiu, W.
  2003; 331 (2): 447-56
- **Structure of the type 1 inositol 1,4,5-trisphosphate receptor revealed by electron cryomicroscopy.** *The Journal of biological chemistry*
  Serysheva, I. I., Bare, D. J., Ludtke, S. J., Kettlun, C. S., Chiu, W., Mignery, G. A.
  2003; 278 (24): 21319-22
- **Structure of the herpesvirus major capsid protein.** *The EMBO journal*
  Bowman, B. R., Baker, M. L., Rixon, F. J., Chiu, W., Quiocho, F. A.
  2003; 22 (4): 757-65
- **Coat protein fold and maturation transition of bacteriophage P22 seen at subnanometer resolutions.** *Nature structural biology*
  Jiang, W., Li, Z., Zhang, Z., Baker, M. L., Prevelige, P. E., Chiu, W.
  2003; 10 (2): 131-5
- **Structure of isolated nucleocapsids from venezuelan equine encephalitis virus and implications for assembly and disassembly of enveloped virus.** *Journal of virology*
  Paredes, A., Alwell-Warda, K., Weaver, S. C., Chiu, W., Watowich, S. J.
  2003; 77 (1): 659-64
- **The skeletal muscle Ca2+ release channel has an oxidoreductase-like domain.** *Proceedings of the National Academy of Sciences of the United States of America*
  Baker, M. L., Serysheva, I. I., Sencer, S., Wu, Y., Ludtke, S. J., Jiang, W., Hamilton, S. L., Chiu, W.
  2002; 99 (19): 12155-60
- **Electron cryo-microscopy of VAT, the archaeal p97/CDC48 homologue from Thermoplasma acidophilum** *JOURNAL OF MOLECULAR BIOLOGY*
  Rockel, B., Jakana, J., Chiu, W., Baumeister, W.
  2002; 317 (5): 673-681
- **Deriving folds of macromolecular complexes through electron cryomicroscopy and bioinformatics approaches.** *Current opinion in structural biology*
  Chiu, W., Baker, M. L., Jiang, W., Zhou, Z. H.
  2002; 12 (2): 263-9
- **Bilamellar cationic liposomes protect adenovectors from preexisting humoral immune responses.** *Molecular therapy : the journal of the American Society of Gene Therapy*
  Yotnda, P., Chen, D. H., Chiu, W., Piedra, P. A., Davis, A., Templeton, N. S., Brenner, M. K.
  2002; 5 (3): 233-41
- **High resolution structural studies of complex icosahedral viruses: a brief overview.** *Virus research*
  Chiu, W., Rixon, F. J.
  2002; 82 (1-2): 9-17
- **Quaternary structure of human fatty acid synthase by electron cryomicroscopy.** *Proceedings of the National Academy of Sciences of the United States of America*
  Brink, J., Ludtke, S. J., Yang, C. Y., Gu, Z. W., Wakil, S. J., Chiu, W.

2002; 99 (1): 138-43

- **Web-based Simulation for Contrast Transfer Function and Envelope Functions.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Jiang, W., Chiu, W.
  2001; 7 (4): 329-334
- **Fourier amplitude decay of electron cryomicroscopic images of single particles and effects on structure determination** *JOURNAL OF STRUCTURAL BIOLOGY*
  Saad, A., Ludtke, S. J., Jakana, J., Rixon, F. J., Tsuruta, H., Chiu, W.
  2001; 133 (1): 32-42
- **CTF corrected stucture of alpha-crystallin B by electron cyro-microscopy.**
  Baldwin, P. R., Ludtke, S. J., Serysheva, Cobb, B. A., Quiocho, F., Petrash, M., Tsuruta, H., Chiu, W.
  BIOPHYSICAL SOCIETY.2000: 8A
- **Scaling structure factor amplitudes in electron cryomicroscopy using X-ray solution scattering** *JOURNAL OF STRUCTURAL BIOLOGY*
  Schmid, M. F., Sherman, M. B., Matsudaira, P., Tsuruta, H., Chiu, W.
  1999; 128 (1): 51-57
- **Solution X-ray scattering-based estimation of electron cryomicroscopy imaging parameters for reconstruction of virus particles** *BIOPHYSICAL JOURNAL*
  Thuman-Commike, P. A., Tsuruta, H., Greene, B., Prevelige, P. E., KING, J., Chiu, W.
  1999; 76 (4): 2249-2261
- **COLD STAGE DESIGN FOR HIGH-RESOLUTION ELECTRON-MICROSCOPY OF BIOLOGICAL-MATERIALS** *ELECTRON MICROSCOPY REVIEWS*
  Downing, K. H., Chiu, W.
  1990; 3 (2): 213-226
- **ALIGNMENT AND MERGING OF ELECTRON-MICROSCOPE IMAGES OF FROZEN HYDRATED CRYSTALS OF THE T4 DNA HELIX DESTABILIZING PROTEIN GP32-STAR-I** *BIOPHYSICAL JOURNAL*
  Grant, R. A., Schmid, M. F., Chiu, W., DEATHERAGE, J. F., Hosoda, J.
  1986; 49 (1): 251-258
- **STRUCTURAL-ANALYSIS OF T4 DNA HELIX DESTABILIZING PROTEIN (GP32-STAR-I) CRYSTAL BY ELECTRON-MICROSCOPY** *JOURNAL OF MOLECULAR BIOLOGY*
  Cohen, H., Chiu, W., Cohen, H. A., Chiu, W.
  1983; 169 (1): 235-248
- **STRUCTURE OF THE SURFACE-LAYER PROTEIN OF THE OUTER-MEMBRANE OF SPIRILLUM-SERPENS** *JOURNAL OF ULTRASTRUCTURE RESEARCH*
  Glaeser, R. M., Chiu, W., Grano, D.
  1979; 66 (3): 235-242
- **FACTORS AFFECTING HIGH-RESOLUTION FIXED-BEAM TRANSMISSION ELECTRON-MICROSCOPY** *ULTRAMICROSCOPY*
  Chiu, W., Glaeser, R. M.
  1977; 2 (2-3): 207-217
- **SINGLE ATOM IMAGE-CONTRAST - CONVENTIONAL DARK-FIELD AND BRIGHT-FIELD ELECTRON-MICROSCOPY** *JOURNAL OF MICROSCOPY-OXFORD*
  Chiu, W., Glaeser, R. M.
  1975; 103 (JAN): 33-54