Tsz Kin Martin Tsui

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EDUCATION

Ph.D., Molecular Biophysics	Florida State University, Tallahassee, FL, U.S.A.	2012-2017
B.S. (ACS accredited), Chemistry	University of California, San Diego, La Jolla, CA	2008-09; 11-12
Associate Student, Chemistry	*The Chinese University of Hong Kong, Hong Kong	2010-2011
Junior Transfer, Chemistry	Santa Monica College, Santa Monica, CA	2007-2008

* Through OAP (Opportunities Abroad Program) by International Center of University of California, San Diego

ACADEMIC POSITIONS AND EMPLOYMENT

Van Andel Institute, *Postdoctoral Fellow* **Sept 2020-Present**
Advisor: Juan Du and Wei Lü, Center for Cancer and Cell Biology—Structural Biology
Project 1: Characterization of drTRPM2 and hsTRPM2 channels in lipid nanodisc by electron microscopy (EM)
Project 2: Characterization of novel solute carrier (SLC) transporters proteins

University of California, San Francisco, San Francisco, CA
Postdoctoral Scholar, Dept. of Pharmaceutical Chemistry, Dr. Kliment Verba **Oct 2018-Aug 2020**
Project 1: Characterization of human protein complexes in mitogen-activated protein kinase (MAPK) pathway
Project 2: Characterization of cancer-associated human kinase protein complexes by cryo-EM
Project 3: Characterization of SARS-CoV-2:human host factor complexes (QBI Coronavirus Research Group, Structural Biology Consortium: https://qbi.ucsf.edu/qcrg/structuralbiology)

University of California, San Francisco, San Francisco, CA **Oct 2017-Sep 2018**
Postdoctoral Scholar, Dept. of Biochemistry & Biophysics, Dr. Alan D. Frankel
Project: Characterization of human host factors of HIV-1 Rev protein and Rev:RRE RNP complexes

The Florida State University, Tallahassee, FL **Sep 2017**
Postdoctoral Research Associate, Dept. of Chemistry & Biochemistry, Drs. James Frederich & Brian Miller
Project: Structural and biochemical studies of a novel psychrotrophic glycosyltransferase

The Florida State University, Tallahassee, FL **May 2013-Aug 2017**
Graduate Research Assistant, Institute of Molecular Biophysics, Dr. Hong Li
Dissertation: Characterization of a novel CRISPR Type II-C Cas9 endonuclease from bacterial thermophile *Acidothermus Cellulolyticus* 11B.
(*Molecular Mechanism and Target Specificity of CRISPR type II-C Cas9*, AHA award no. 15PRE25330004)
Project 1: Characterization of novel CRISPR C2c1 and C2c2 effector complexes
Project 2: Characterization of CRISPR Cas6-RNA complex by X-ray & Neutron Crystallography

The Chinese University of Hong Kong, Shatin, Hong Kong **Jan 2011-May 2011**
Associate Student Researcher, Dept. of Chemistry, Dr. Sik Lok (Sherlock) Lam
Project: Biomolecular studies of wobble base-paired DNA Pb31 – 31-mer nucleotide with stem loop affects DNase activity using 1-D and 2-D NMR

University of California, San Diego, La Jolla, CA **Jan 2009-Jul 2010**
Undergraduate Research Assistant, Dept. of Chemistry and Biochemistry, Dr. Hector Viadiu
Project 1: Structural studies of wild-type DNA-binding protein HIV-1 integrase (IN)
Project 2 (collaborate): Biophysical and structural studies of membrane protein transporter MerT (NSF award no. 0954267) by X-ray crystallography with Dr. Hiroyuki Akama

PUBLICATIONS (https://scholar.google.com/citations?user=TX3TupkAAAAJ)

Peer-reviewed Publications:

1) Schoof, M., Faust, B., Saunders, R.A., Sangwan, S., Rezelj, V., Hoppe, N., Boone, M., Billesbolle, C.B., Puchades, C., Azumaya, C.M., Kratochvil, H.T., Zimanyi, M., Deshpande, I., Liang, J., Dickson, S.M., Nguyen, H.C., Chio, C.M., Merz, G.E., Thompson, M.C., Diwanji, D., Schaefer, K., Chio, U.S., Gupta, M., Jin, M., Li, F., Liu, Y., Zhang, K., Sun, M., Smith, A.M., Rizo, A.N., Moss, F., Brilot, A.F., Anand, A.A., Dobzinski, N., Zha, B.S., Barsi-Rhyne, B., Belyy, V., Barile-Hill, A.W., Gupta, S., Simoneau, C.R., Leon, K., White, K.M., Nock, S., Liu, Y., Krogan, N.J., Ralston, C.Y., Swaney, D.L., Garcia-Sastre, A., Ott, M., Vignuzzi, M., **QCRG Structural Biology Consortium**, Walter, P., Manglik, A., (2020) "An ultrapotent synthetic nanobody neutralizes SARS-CoV-2 by stabilizing inactive Spike" *Science*, eabe3255. doi: 10.1126/science.abe3255
2) Bracken, C.J., Lim, S.A., Solomon, P., Rettko, N.J., Nguyen, D.P., Zha, B.S., Schaefer, K., Byrnes, J.R., Zhou, J., Lui, I., Liu, J., Pance, K., **QCRG Structural Biology Consortium**, Zhou, X.X., Leung, K.K. & Wells, J.A. (2020) Bi-paratopic and multivalent VH domains block ACE2 binding and neutralize SARS-CoV-2. *Nature Chemical Biology*. doi: 10.1038/s41589-020-00679-1
3) Gordon, D.E., Hiatt, J., Bouhaddou, M., Rezelj, V.V., Ulferts, S., Braberg, H., Jureka, A.S., Obernier, K., Guo, J.Z., Batra, J., Kaake, R.M., Weckstein, A.R., Owens, T.W., Gupta, M., Pourmal, S., Titus, E.W., Cakir, M., Soucheray, M., McGregor, M., Cakir, Z., Jang, G., O'Meara, M.J., Tummino, T.A., Zhang, Z., Foussard, H., Rojc, A., Zhou, Y., Kuchenov, D., Hüttenhain, R., Xu, J., Eckhardt, M., Swaney, D.L., Fabius, J.M., Ummadi, M., Tutuncuoglu, B., Rathore, U., Modak, M., Haas, P., Haas, K.M., Naing, Z.Z.C., Pulido, E.H., Shi, Y., Barrio-Hernandez, I., Memon, D., Petsalaki, E., Dunham, A., Marrero, M.C., Burke, D., Koh, C., Vallet, T., Silvas, J.A., Azumaya, C.M., Billesbølle, C., Brilot, A.F., Campbell, M.G., Diallo, A., Dickinson, M.S., Diwanji, D., Herrera, N., Hoppe, N., Kratochvil, H.T., Liu, Y., Merz, G.E., Moritz, M., Nguyen, H.C., Nowotny, C., Puchades, C., Rizo, A.N., Schulze-Gahmen, U., Smith, A.M., Sun, M., Young, I.D., Zhao, J., Asarnow, D., Biel, J., Bowen, A., Braxton, J.R., Chen, J., Chio, C.M., Chio, U.S., Deshpande, I., Doan, L., Faust, B., Flores, S., Jin, M., Kim, K., Lam, V.L., Li, F., Li, J., Li, Y-L, Li, Y., Liu, X., Lo, M., Lopez, K.E., Melo, A.A., Moss III, F.R., Nguyen, P., Paulino, J., Pawar, K.I., Peters, J.K., Pospiech Jr., T.H., Safari, M., Sangwan, S., Schaefer, K., Thomas, P.V., Thwin, A.C., Trenker, R., Tse, E., **Tsui, T.K.M.**, Wang, F., Whitis, N., Yu, Z., Zhang, K., Zhang, Y., Zhou, F., Saltzberg, D., **QCRG Structural Biology Consortium**, Hodder, A.J., Shun-Shion, A.S., Williams, D.M., White, K.M., Rosales, R., Kehrer, T., Miorin, L., Moreno, E., Patel, A.H., Rihn, S., Khalid, M.M., Vallejo-Gracia, A., Fozouni, P., Simoneau, C.R., Roth, T.L., Wu, D., Karim, M.A., Ghoussaini, M., Dunham, I., Berardi, F., Weigang, S., Chazal, M., Park, J., Logue, J., McGrath, M., Weston, S., Haupt, R., James Hastie, C., Elliott, M., Brown, F., Burness, K.A., Reid, E., Dorward, M., Johnson, C., Wilkinson, S.G., Geyer, A., Giesel, D.M., Baillie, C., Raggett, S., Leech, H., Toth, R., Goodman, N., Keough, K.C., Lind, A.L., Zoonomia Consortium, Klesh, R.J., Hemphill, K.R., Carlson-Stevermer, J., Oki, J., Holden, K., Maures, T., Pollard, K.S., Sali, A., Agard, D.A., Cheng, Y., Fraser, J.S., Frost, A., Jura, N., Kortemme, T., Manglik, A., Southworth, D.R., Stroud, R.M., Alessi, D.R., Davies, P., Frieman, M.B., Ideker, T., Abate, C., Jouvenet, N., Kochs, G., Shoichet, B., Ott, M., Palmarini, M., Shokat, K.M., García-Sastre, A., Rassen, J.A., Grosse, R., Rosenberg, O.S., Verba, K.A., Basler, C.F., Vignuzzi, M., Peden, A.A., Beltrao, P., Krogan, N.J. (2020) Comparative host-coronavirus protein interaction networks reveal pan-viral disease mechanisms. *Science*, eabe9403. DOI: 10.1126/science.abe9403
4) **Tsui, T.K.M.**, Hand, T.H., Duboy, E.D., and Li, H. (2017) The impact of DNA topology and guide length on target selection by a cytosine-specific Cas9. *ACS Synthetic Biology*, **6**(6), 1103-1113. doi: 10.1021/acssynbio.7b00050 (PubMed) (Journal) [**Cover of ACS Synth Biol 2017 Volume 6, Issue 6**]
5) **Tsui, T.K.M.** and Li, H. (2015) Structure principles of CRISPR-Cas surveillance and effector complexes. *Annual Review of Biophysics*, **44**, 229-255. doi: 10.1146/annurev-biophys-060414-033939 (PubMed) (Journal)

Additional Publications:

6) **Tsui, T.K.M.**, Mundoma, C. and Li, H. (2013) pH Effects on Stability and Homogeneity of Protein Complex. *DynaPro (Dynamic Light Scattering)* under *DLS Application Notes - Protein, Wyatt Technology Corporation*, online. (http://www.wyatt.com/files/literature/app-notes/dls-cuvette/ph-effects-stability.pdf)

AWARDS, HONORS, AND PATENTS

- CCSF-UCSF Inclusive Mentoring Fellow (Link) 2020
- U.S. Patent Application No, US20180265864A1 (Pending) 2019
- Kasha Award, Institute of Molecular Biophysics, Florida State University (Link) 2018
- American Heart Association Predoctoral Fellowship (Great Southeast Affiliates) (Link) 2015-2017
- FSU Fellows Society, Florida State University (Link) 2015
- JINS (Joint Institute for Neutron Sciences) Travel Award for 4th Workshop on Neutron Scattering Application in Structural Biology, Oak Ridge National Lab June 2013
- FSU Dean's Scholarship, Florida State University 2012-2013
- The Bruce Hass Memorial Award, Santa Monica College (Link) 2008

PRESENTATIONS

Invited Presentation:

1) **Tsui, T.K.M.** *The impact of DNA topology and guide length on target selection by a cytosine-specific Cas9*, Research Seminar series, Dept. of Chemistry, The Chinese University of Hong Kong, Hong Kong Apr 2017
2) **Tsui, T.K.M.** *Biochemical and structural studies of a novel CRISPR Cas9 enzyme*, Fellows Society Research Sharing Luncheon, Florida State University, HS&F House, Tallahassee, FL May 2016
3) **Tsui, T.K.M.** *From antiviral to genome engineering: CRISPR-Cas9, a RNA-guided endonuclease*, Research Seminar series, Dept. of Chemistry, The Chinese University of Hong Kong, Hong Kong July 2014

Selected Campus / Departmental Presentation:

1) **Tsui, T.K.M.** *Target Specificity and Molecular Mechanism of CRISPR Type II-C Cas9*, Kasha Laboratory Building, Florida State University, Tallahassee, FL Sept 2015

Poster Presentation:

1) **Tsui, T.K.M.**, Hand, T.H., and Li, H. *The Impact of DNA Topology on Target Selection by a Cytosine-Specific Cas9*. Biophysical Society 61st Annual Meeting, Ernest N. Morial Convention Center, New Orleans, LA. doi: 10.1016/j.bpj.2016.11.431 Feb 2017
2) **Tsui, T.K.M.** and Li, H. *Structural and Function Studies of DNA Editing Cas9*. Arts and Sciences Spectrum, Florida State University, Chemical Sciences Laboratories, Tallahassee, FL Mar 2015
3) **Tsui, T.K.M.** *Recognition and Cleavage of a Nonstructured CRISPR RNA by Its Processing Endoribonuclease Cas6*, Symposium – Neutron in Structural Biology, 4th Workshop on Neutron Scattering Applications in Structural Biology, Oak Ridge National Laboratory, Oak Ridge, TN Jun 2013
4) **Tsui, T.K.M.** and Viadiu, H. *Preliminary Structural Studies on HIV-1 Integrase*, 4th Annual ACSSA Undergraduate Research Symposium, University of California, San Diego, La Jolla, CA May 2010

TEACHING AND RELATED EXPERIENCE

University of California, San Diego, La Jolla, CA **Apr 2012-Jun 2012**
Teaching Assistant, Department of Chemistry and Biochemistry

Santa Monica College, Santa Monica, CA **Jan 2008-Jul 2008**
Chemistry Tutor, Department of Science, Science Learning Resource Center

MENTORSHIP

University of California, San Francisco

Yi (Zita) Gao, City College of San Francisco, Genetics, Class of 2022 (B.S., Genetics, UC Davis) 2020
Daphne Chen, UCLA, Biophysics, Class of 2020 (B.S.; NIH College Summer Intern) 2019
Devan Diwanji, M.D./Ph.D. Student, MSTP, Class of 2021 (Ph.D.), Class of 2023 (M.D.) 2018-2020

Florida State University

13 students and most of the new/temporary lab member (undergraduate volunteer, Undergraduate Research Opportunity Program students, graduate students, rotation students, technicians, postdocs) since 2014-2017.

DEPARTMENTAL AND UNIVERSITY SERVICE

Florida State University, Tallahassee, FL

Search and organization committee, 16-17' Molecular Biophysics students-invited Biochemistry seminar speaker (Wayne Hendrickson, Columbia University) Feb 2017

Student-speaker lunch organizer, Structural Biology/Biochemistry seminar speaker (Elizabeth Villa, University of California, San Diego) Mar 2017

ADDITIONAL UNIVERSITY SERVICE

University of California, San Francisco, San Francisco, CA

Mentor, Bioscience internship program at CCSF / Bridge to Biosciences program at CCSF, UCSF 2020

Mentor, The First Generation to College Organization (FG2C), UCSF 2017-2020

Florida State University, Tallahassee, FL

Mentor, ProfessioNole Mentors Program 2021-Present

President, Graduate Students in Interdisciplinary Sciences (GSIS), FSU 2016-2017

Co-founder & *vice-president*, Graduate Students in Interdisciplinary Sciences (GSIS), FSU 2015-2016

Mentor, Florida-Georgia Louis Stokes Alliance for Minority Participation in STEM (FGLSAMP) 2015-2017

Judge, Capital Regional Science & Engineering Fair (CRSEF) 2014-2017

University of California, San Diego, La Jolla, CA

Mentor, Mentor-Mentee Program, American Chemical Society-Student Affiliates 2011-2012

SELECTED COMMUNITY AND OUTREACH ACTIVITIES

University of California, San Francisco, San Francisco, CA

Guest speaker, California Life Sciences Association–Biotech Week SFUSD, Galileo Academy of Science and Technology, San Francisco, CA Mar 2020

Guest speaker, CLSA–Biotech Week SFUSD, Mission High School, San Francisco, CA Feb 2020

Guest speaker, CLSA–Biotech Week SFUSD, Phillip and Sala Burton Academic HS, SF, CA Apr 2019

Guest speaker, CLSA–Biotech Week SFUSD, Galileo Academy of Science and Tech., SF, CA Mar 2019

Guest lecturer, City College of San Francisco, San Francisco, CA May 2018

STEM Mentor, 5th San Francisco STEM Career Day Mar 2019

STEM Mentor, 4th San Francisco STEM Career Day Mar 2018

REFERENCES

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