TING-JEN RACHEL CHENG, PH.D. (鄭婷仁)

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RESEARCH INTEREST

My interest is in the area of drug discovery and development, specifically, (1) Target discovery and validation of diseases, especially for antibiotics resistance, (2) Target-based or cell-based assay development for drug screening, (3) identification of molecular mechanisms of drug actions.

SUMMARY OF QUALIFICATIONS

A dedicated biologist with a proven track record of research excellence and significant accomplishments. Scientific expertise:

- *Drug Discovery* **—** develop and optimize both target-based and cell-based assays in a high throughput format for drug screening.
- *Molecular Biology* — proficient in different cloning strategies, random mutagenesis, site-directed mutagenesis, and various expression systems to produce functional proteins for in vitro analysis, and design different reporter system for cell-based assay.
- *Cell Biology* — standardize the operations of mammalian cell culture facility, develop protein localization analysis, and analyze the transcriptional regulations of genes.
- *Protein Chemistry* — develop strategies of protein purification, analyze protein expression profiles, and design protein phosphorylation analysis.
- *Computational analysis* **—** working knowledge of chemical and biological databases, chemoinformatic analysis of interactions between small molecules and specific targets.

EDUCATION

Ph.D., Life Sciences, National Tsing Hua University, Hsinchu, Taiwan 1999
B. Eng., Chemical Engineering, National Tsing Hua University, Hsinchu, Taiwan 1993

PROFESSIONAL EXPERIENCES

Postdoctoral Fellow 2000-present
Keck Graduate Institute of Applied Life Sciences, Claremont, California, United States

- Developed target-based assays in a high throughput format to facilitate anti-cancer drug screening.
- Developed a model system for screening of novel HIV protease inhibitor(s).
- Identified novel HIV protease inhibitors by using high-throughput screening of chemical libraries.
- Established drug resistance profiles of HIV protease variants using target-based and cell-based systems.
- Employed current molecular biology techniques to obtain functional recombinant enzymes for in vitro analysis.
- Participated in developing and optimizing an algorithm for integration of HIV-antiviral drug actions and sequence information of HIV virus strains.

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PROFESSIONAL EXPERIENCES (CONT'D)

Project Manager 1999-2000
Maxigen Biotech Inc., Taipei, Taiwan
- Successfully conducted technology transfer of collagen extraction and purification for wound healing products.
- Coordinated research resources and facilities.

Research Associate 1992-1999
Department of Life Sciences, National Tsing Hua University, Hsinchu, Taiwan
- Investigated signaling pathways leading to apoptosis, reorganization of intermediate filaments, and differential expression of specific genes in drug-treated cells.
- Discovered a new kinase, mitogen-activated protein kinase-activated protein kinase-2 (MAPKAPK-2), and protein phosphatase 2A are involved in the pathways leading to reorganization of cytoskeleton.
- Analyzed co-localization of protein phosphatase 2A and intermediate filaments. Investigated compartmentalization of heat shock proteins in the cells experienced heat treatment.
- Designed and constructed protein variants for functional studies.
- Performed protein phosphorylation analysis. Determine protein modification site(s) by peptide mapping and manual Edman degradation.
- Supervised the daily operations of the laboratory of Professor Yiu-Kay Lai in the Department of Life Sciences, National Tsing Hua University, Hsinchu, Taiwan.

Summer Intern 1995
Department of Medicinal Chemistry, Univ. of North Carolina, North Carolina, United States
- Conducted anti-cancer drug screening by DNA topoisomerase II activity assay.
- Analyzed cytotoxicity of anti-cancer drug candidates.

PROFESSIONAL AFFILIATION

American Society of Microbiology (2003-present)

CERTIFICATE

Technical Writing (Clemson University, 2004)

PUBLICATIONS

1. Cheng, T.-J.*, Goodsell, D., and Kan, C.-C. Identification of sanguinarine as a novel HIV protease inhibitor. *Letters in Drug Design & Discovery*. In press (2005)
2. Cheng, T.-J.*, Brik, A., Wong, C.-H., and Kan, C.-C. Model system for high-throughput screening of the human immunodeficiency virus (HIV) protease inhibitors in *Escherichia coli*. *Antimicrob. Agents Chemother.* 48,2437-2447 (2004).
3. Cheng, T.-J.*, Tseng, Y.-F., Chang, W.-M., Chang, M.D.-T., and Lai, Y.-K. Retaining of the assembly capability of vimentin phosphorylated by mitogen-activated protein kinase-activated protein kinase-2. *J. Cell. Biochem.* 89,589-602 (2003).

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4. Cheng, T.-J.*, Rey, P.G., Poon, T., and Kan, C.-C. Kinetic studies of human tyrosyl-DNA phosphodiesterase, an enzyme in the topoisomerase I DNA repair pathway. *Eur. J. Biochem.* 269,3697-704 (2002).
5. Cheng, T.-J.*, Lin, Y.-L., Chiang, A.-S., and Lai, Y.-K. Association of protein phosphatase 2A and its substrate vimentin intermediate filaments in 9L rat brain tumor cells. *J. Cell. Biochem.* 79,126-138 (2000).
6. Hung, J.-J., Cheng, T.-J.*, Lai, Y.-K., Chang, M.D.-T. Differential activation of p38 mitogen-activated protein kinase and extracellular signal-regulated protein kinase confers cadmium-induced HSP70 expression in 9L rat brain tumor cells. *J. Biol. Chem.* 273:31924-31931 (1998).
7. Cheng, T.-J.*, and Lai, Y.-K. Identification of mitogen-activated protein kinase-activated protein kinase-2 as a vimentin kinase activated by okadaic acid in 9L rat brain tumor cells. *J. Cell. Biochem.* 71,169-181 (1998).
8. Hung, J.-J., Cheng, T.-J.*, Chang, M.D.-T., Chen, K.-D., Huang, H.-L., and Lai, Y.-K. Involvement of heat shock elements and basal transcription elements in the differential induction of the 70-kDa heat shock protein and its cognate by cadmium chloride in 9L rat brain tumor cells. *J. Cell. Biochem.* 71,21-35 (1998).
9. Wang, T.-T., Chiang, A.-S., Chu, J.-J., Cheng, T.-J.*, Chen, T.-M., and Lai, Y.-K. Concomitant alterations in distribution of 70 kDa heat shock proteins, cytoskeleton, and organelles in heat shocked 9L cells. *Intl. J. Biochem. Cell Biol.* 30,745-756 (1998).
10. Cheng, T.-J.*, Chen, T.-M., Chen, C.-H., and Lai, Y.-K. Induction of stress response and differential expression of 70 kDa stress proteins by sodium fluoride in HeLa and rat brain tumor 9L cells. *J. Cell. Biochem.* 69,221-231 (1998).
11. Perng, M.-D., Cheng, T.-J.*, Chen, C.-M., and Lai, Y.-K. Induction of aggregation and augmentation of protein kinase-mediated phosphorylation of purified vimentin intermediate filaments by Withangulatin A. *Mol. Pharmacol.* 46,612-617 (1994).
12. Cheng, T.-J.*, and Lai, Y.-K. Transient increase in vimentin phosphorylation and vimentin-HSC70 association in 9L rat brain tumor cells experiencing heat-shock. *J. Cell. Biochem.* 54:100-109 (1994).

PATENTS

U.S. Patent 6,787,327
September 7, 2004
For: Human tyrosine-DNA phosphodiesterase variant polypeptides and method of use thereof

U.S. Provisional Patent Application
Filed on March 15, 2004
For: A model system for high-throughput screening of novel human immunodeficiency virus (HIV) protease inhibitors in Escherichia coli

U.S. Provisional Patent Application
Filed on May, 2003
For: Model System for In-vivo and In-vitro screening of protease inhibitors

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