

**Joseph Ng, PhD, Professor UAH Biological Sciences Department,  
Director UAH Biotechnology Science and Engineering Program**



**Biography**

The goal of our laboratory is to elucidate the structure and function of proteins involved in the passage of genetic information. We are developing and utilizing the combined techniques of Molecular Biology, Protein Chemistry, and X-ray and Neutron Crystallography to decipher the molecular mechanism and action of specific hyperthermophilic proteins. Strategies and tools for the rapid construction of new protein complexes are valuable for biotechnology applications. Our studies include the design and engineering of macromolecular systems for DNA replication using gene synthesis and structural biology tools.

**Academic Interests**

- Structural Biology
- Synthetic Biology and Engineering

**Specialty**

- Crystallization
- Structure/Function of Extremeophilic Proteins
- Synthetic Biology

**Education**

Ph.D., Biochemistry, University of California, Los Angeles, 1992  
B.S., Biochemistry, University of California, Los Angeles, 1985

## Publications

- Ng, J.D., Baird, J.K., Coates, L., Garcia-Ruiz, J.M., Hodge, T.A. and Huan, S. (2015). Large volume protein crystal growth for Neutron Macromolecular Crystallography. *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 71:358-370.
- Pusey, M., Barcena, J., Morris, M., Singhal, A., Yuan, Q. and Ng, J.D. (2015). Trace fluorescent labeling for protein crystallization. *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 71:806-814.
- "Biophysical and atomic force microscopy characterization of the RNA from satellite tobacco mosaic virus." *Nucleic Acids Res.* Kuznetsov, Y.G., Dowell, J.J., Gavira, J.A., Ng, J.D. and McPherson A. (2010).
- "Efforts to enhance coverage of crystallography in United States secondary education." *J. Appl. Cryst.* 43:1181-1188. Authors (Date).
- "Structure of endonuclease IV homologue from *Thermotoga maritima* in the presence of active-site divalent metal ions." *Acta Crystallogr Section F Structural Biol Cryst. Commun.* 66:1003-1012. Tomanicek, S.J., Hughes, R.C., Ng, J.D. and Coates, L. (2010).
- "Purification, crystallization and preliminary crystallographic analysis of a thermostable endonuclease IV from *Thermotoga maritima*." *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 65:1317-1319. Hughes, R.C., Tomanicek, S.J., Ng, J.D. and Coates, L. (2009).
- "Counterdiffusion methods applied to protein crystallization." *Prog Biophys Mol Biol.* 101:26-37. Otálora, F., Gavira, J.A., Ng, J.D. and García-Ruiz J.M. (2009).
- "Recombinant production, crystallization and preliminary X-ray analysis of PCNA from the psychrophilic archaeon *Methanococoides burtonii* DSM 6242." *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 65:1131-1135. Byrne-Steele, M.L., Hughes, R.C. and Ng, J.D. (2009).
- "Expression, purification and preliminary X-ray analysis of proliferating cell nuclear antigen from the archaeon *Thermococcus thio-reducens*." *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 65:906-909. Byrne-Steele, M.L. and Ng, J.D. (2009).
- "Structure of full-length ubiquitin-conjugating enzyme E2-25K (huntingtin-interacting protein 2)." *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 65:440-444. Wilson, R.C., Hughes, R.C., Flatt, J.W., Meehan, E.J. and Ng, J.D. and Twigg, P.D. (2009).
- "New DNA polymerase from the hyperthermophilic marine archaeon *Thermococcus thio-reducens*." *Extremophiles.* 12:775-788. Marsic, D., Flaman, JM and Ng, J.D. (2008).
- "PCR-based gene synthesis to produce recombinant proteins for crystallization." *BMC Biotechnology.* 8:44. Marsic, D., Hughes, RC, Byrne-Steele, M.L. and Ng, J.D. (2008).

- "In situ X-ray analysis of proteins crystals in low birefringent and X-ray transmissive plastic micro-channels." *Acta Crystallogr D Biol Crystallogr.* D64:189-197. Ng, J.D., Stevens, R.C. Clark P. and Kuhn P. (2008).
- "Protein crystallization in restricted geometry: advancing old ideas for modern times in structural proteomics." *Methods in Molecular Biology.* 426:363-376. Ng, J.D., Stevens, R.C. and Kuhn P. (2008).
- "Kinetics of protein crystallization." *Focus on Crystal Growth Research.* 171-192. Baird, J.K., Caraballo, K. and Ng, J.D. (2007).
- "Backbone 1H, 15N, and 13C Resonance Assignments and Secondary Structure of a Novel Protein OGL-20PT-358 from Hyperthermophile Thermococcus thioreducens." *Molecules and Cells.* 24:437-440. Wilson, R.C., Hughes, R.C., Curto, E.V., Ng, J.D. and Twigg, P.D. (2007).
- "Can small laboratories do structural genomics?" *Crystal Growth and Design.* 7:2226-2238. Hughes, R. and Ng, J.D. (2007).
- "Crystal structure solution of a ParB-like nuclease at atomic resolution." *Proteins.* 70:263-267. Shaw, N., Tempel W, Chang, J., Yang, H., Cheng, C., Ng, J.D., Rose, J., Rao, Z. Wang, B.C. Liu, Z.J, (2007).
- "(NZ)CH...O contacts assist crystallization of a ParB-like nuclease." *BMC Struct. Biol.* 7:46. Shaw, N. Cheng, C., Tempel, W. Chang, J. Ng, J.D., Wang, XY, Perrett, S., Rose, J., Rao, Z., Wang, B.C. and Liu, ZJ.
- "Thermococcus thioreducens sp. nov., a novel hyperthermophilic, obligately sulfur-reducing archaeon from a deep-sea hydrothermal vent." *Int. J Syst Evol Microbiol.* 57:1612-1618. Pikuta, E., Marsic, D., Itoh, T., Bej, A.K., Tang, J., Whitman, W., Ng, J.D., Garriott, O.K. and Hoover, R.B. (2007).