
CURRICULUM VITAE

Joseph David Ng

Professor

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a. Professional preparation

- The Scripps Research Institute, Sabbatical Leave, 2006
Area of research: Macromolecular crystallization and technology development in X-ray crystallography for structural genomics
- Investigación del CSIC en la Universidad de Granada, Research fellow, 1998
Area of Research: Bimolecular crystallization
- IBMC, CNRS, Strasbourg, France, Postdoctoral fellow, 1993-1998
Area of Research: Macromolecular crystal growth of RNA and nucleic acid binding proteins, X-ray crystallography
- University of California, Riverside, Biochemistry, Ph.D. 1992
Area of Research: Molecular biology applications toward X-ray structure investigations
- University of California, Los Angeles, Biochemistry, B.S. 1985
Area of Research: Biophysical studies of membrane vesicles

b. Appointments

- 2014-present Professor, University of Alabama in Huntsville
- 2004-2014 Associate Professor, University of Alabama in Huntsville
Biotechnology Science and Engineering Program Director
- 2005-present President of iXpressGenes Inc. (formerly ExtremoZyme Inc.)
- 1998-present Adjunct Professor, Material Science, University of Alabama in Huntsville
- 1998-2004 Assistant Professor, University of Alabama in Huntsville

c. Publications

- Havlickova, P., Brinsa, V., Brynda, J., Pchl, P., Prudnikova, T., Mesters, J.R., Kascakova, B., Kutý, M., Pusey, M.L., **Ng, J.D.**, Rezacova, P. and Smatanova, I.K. (2019). A novel structurally characterized haloacid dehalogenase superfamily phosphatase from *Thermococcus thio-reducens* with diverse substrate specificity. *Acta Cryst. D75*, 743-752.
- **Ng, J. D.**, Baird, J. K., Coates, L., Juan-Manuel, G.-R., Teresa, H., Sijay, H. (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.
- Coates, L., Tomanicek, S., Shrader, T., Weiss, K., **Ng, J.D.**, Juttner, P. and Ostermann, A. (2014). Cryogenic neutron protein crystallography: routine methods and potential benefits. *Journal of Applied Crystallography*. 47:1431-1434.
- **Ng, J.D.**, Dowell, J.J., Kar, A.K., Hansen, K., Thundat, T. and George, M.A. (2013). Measurement of temperature induced unfolding of DNA hairpins by microcantilever sensors. *Open Journal of Applied Biosensor*. 2:78-82.
- Tomanicek, S.J., Standaert, R.F., Weiss, K.L., Ostermann, A., Schrader, T.E., **Ng, J.D.** Coates L. (2013). Neutron and X-ray crystal structures of a perdeuterated enzyme inhibitor complex reveal the catalytic proton network of the Toho-1 β -lactamase for the acylation reaction. *J. Biol. Chem.* 288(7):4715-4722.
- Hughes, R.C., Coates, L., Blakeley, M.P., Tomanicek, S.J., Langan, P., Kovalesvsky, A., García-Ruiz, J.M. and **Ng, J.D.** (2012). Inorganic pyrophosphatase crystals from *Thermococcus thio-reducens* for X-ray and neutron diffraction. *Acta Crystallogr Sect F Struct Biol Cryst Commun* 68:1482-1487.

- Chu, X.Q., Gajapathy, M., Weis, K., Mamontov, E., **Ng, J.D.** and Coates, L. (2012). Dynamic Behavior of Oligomeric Inorganic Pyrophosphatase Explored by Quasielastic Neutron Scattering. *The Journal of Physical Chemistry* 116:9917-9921.
- Tomanicek, S.J., Hughes, R.C., **Ng, J.D.** and Coates, L. (2010). Structure of the endonuclease IV homologue from *Thermotoga maritima* in the presence of active-site divalent metal ions. *Acta Crystallogr Sect F Struct Biol Cryst Commun* 66:1003-1012.
- Kantardjieff, K.A., Lind, C. **Ng, J.D.** and Santarsiero, B.(2010). Efforts to enhance coverage of crystallography in United States secondary education. *J. Applied Crystallography* 43, 1181–1188.
- Kuznetsov, Y.G., Dowell, J.J., Gavira, J.A., **Ng, J.D.** and McPherson, A. (2010). Biophysical and atomic force microscopy characterization of the RNA from satellite tobacco mosaic virus. *Nucleic Acids Research* 38(22):8284-94.
- Hughes, R.C., Tomanicek, S.J., **Ng, J.D.** and Coates, L. (2009). 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.
- Otorola, F., Gavira, J.A., **Ng, J.D.**, Garcia-Ruiz, J.M. (2010) Counter-Diffusion Methods Applied to Protein Crystallization. *Progress in Biophysics and Molecular Biology* 101:26-37.
- Byrne-Steele, M., Hughes, R.C. and **Ng, J.D.** (2009). Recombinant production, crystallization and preliminary X-ray analysis of PCNA from the psychrophilic archaeon *Methanococoides burtonii* DSM 6242. *Acta Crystallogr F65* :1131-1135.
- Byrne-Steele, M. and **Ng, J.D.** (2009). Expression, purification and preliminary X-ray analysis of proliferating cell nuclear antigen from the archaeon *Thermococcus thioreducens*. *Acta Crystallogr F65* :906-909.
- Wilson, RC, Hughes, RC, Flatt, JW, Meehan, EJ, **Ng, J.D.** and Twigg, P.D. (2009). The crystal structure of full-length ubiquitin-conjugating enzyme E2-25 kDa (Huntingtin-interacting protein 2). *Acta Crystallogr Sect F Struct Biol Cryst Commun*. F65:440-444.
- Marsic, D., Flaman, JM and **Ng, J.D.** (2008). New DNA polymerase from the hyperthermophilic marine archaeon *Thermococcus thioreducens*. *Extremophiles* 12:775-788.
- Marsic, D., Hughes, RC, Byrne-Steele, M.L. and **Ng, J.D.** (2008). PCR-based gene synthesis to produce recombinant proteins for crystallization. *BMC Biotechnology*. 8:44.
- **Ng, J.D.**, Clark P., Stevens, R.C. and Kuhn P. (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. 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.
- Baird, J.K., Caraballo, K. and **Ng, J.D.** (2007). Kinetics of protein crystallization. Book Chapter in Focus on Crystal Growth Research (Ed: G.V. Karas) pp 171-192.
- Wilson, R.C., Hughes, R.C., Curto, E.V., **Ng, J.D.** and Twigg, P.D. (2007). Backbone ¹H, ¹⁵N, and ¹³C Resonance Assignments and Secondary Structure of a Novel Protein OGL-20P^T-358 from Hyperthermophile *Thermococcus thioreducens* sp. nov. *Molecules and Cells* 24:437-440.
- Hughes, R. and **Ng, J.D.** (2007). Can small laboratories do structural genomics? *Crystal Growth and Design* 7:2226-2238.
- Shaw, N., Tempel W, Chang, J., Yang, H., Cheng, C., **Ng, J.D.**, Rose, J., Rao, Z. Wang, B.C. Liu, Z.J, (2007). Crystal structure solution of a ParB-like nuclease at atomic resolution. *Proteins* 70:263-267.
- 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. (NZ)CH...O contacts assist crystallization of a ParB-like nuclease. *BMC Struct. Biol.* 7:46.
- Pikuta, E., Marsic, D., Itoh, T., Bej, A.K., Tang, J., Whitman, W., **Ng, J.D.**, Garriott, O.K. and Hoover, R.B. (2007). *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.
- **Ng, J.D.** and Garcia-Ruiz, J.M. (2006). Counter-diffusion capillary crystallization for structural genomics. *Trends in Drug Discovery* 3:36.
- Pradhan, D., Marsic, D., Garriott, O., Meehan, E., and **Ng, J.D.** (2006). Isolation of Novel Alkaliphilic Bacteria from Lake Makat, Tanzania and Recombinant Expression of Two New Proteases. *Proceedings of International Society of Extremophile and their Application (ISEA, Tokyo, Japan)*3:330.

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- Liu, Z. J.; Tempel, W.; **Ng, J. D.**; Lin, D.; Shah, A. K.; Chen, L.; Horanyi, P. S.; Habel, J.; Kataeva, I.; Xu, H.; Yang, H.; Chang, J. C.; Huang, L.; Chang, S.; Zhou, W.; Lee, D.; Praissman, J.; Zhang, H.; Newton, M. G.; Rose, J. P.; Richardson, J. S.; Richardson, D. C.; Wang, B.-C.(2005). The High Throughput Protein to Structure Pipeline at SECSG. *Acta Crystallogr D Biol Crystallogr* 61:679-84.
- Bernhardsdotter, E.C.M.J., **Ng, J.D.**, Garriott, O.K. and Pusey, M.L. (2005). Enzymatic properties of an alkaline chelator resistant α -amylase from an alkaliphilic *Bacillus* sp. Isolate L1711. *Process Biochemistry* 40:2401-2408.
- Pusey, M.L., Liu, Z-J, Tempel, W., Praissman, J., Lin, D., Wang, B-C., Gavira, J.A. and **Ng, J.D.** (2005). Life in the fast lane for protein crystallization and X-ray crystallography. *Progress in Biophysics and Molecular Biology* 88:359-386.
- **Ng, J.D.** (2004). DNA to protein and perspectives on protecting the fruits of structural genomic research. *Journal of International Law* 1: 40-42.
- **Ng, J.D.**, Gavira, J.A. and Garcia-Ruiz MA. (2003). Protein crystallization by capillary counter-diffusion for applied crystallographic structure determination. *Journal of Structural Biology* 142:218-231.
- Barba-de la Rosa, A. P., **Ng, J.**, Day, J. and McPherson, A. (2003) Structural characterization of satellite tobacco mosaic virus RNA. *Agrocienda* 37, 503-510.
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- Gavira, J.A., Lopéz-Jaramillo, J., Toh, D., Garcia-Ruiz, J.M. and **Ng, J.D.** (2002). *Ab initio* crystallographic structure determination of insulin form protein to electron density without crystal handling. *Acta Crystallographica Section D58* :1085-1254.
- **Ng, J.D.**, Sauter, C., Lorber, B., Kirkland, N., Arnez, J. and Giegé, R. (2002). Comparative analysis of space- and earth-grown crystals of an aminoacyl-tRNA synthetase: Space-grown crystals are more useful for structural determination. *Acta Crystallographica Section D58:645-652*.
- Hoover, R.B., Pikuta, E. V., Marsic, D. and **Ng, J.D.** (2001). Anaerobic Psychrophiles from Alaska, Antarctica, and Patagonia: Implications to Possible Life on Mars and Europa. *Proceedings to the International Society for Optical Engineering: Instruments, Methods and Missions for Astrobiology II* . 4495:313.
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- Charron, C., Sauter, C., Zhu, D.W., **Ng, J.D.** Kern, Lorber,B. and Giegé, R. (2001). Packing contacts in orthorhombic and monoclinic crystals of a thermophilic aspartyl-tRNA synthetase favor the hydrophobic regions of the protein. *J. Cryst. Growth* 232: 376-386.

- Zhu, D.W., Lorber, B., Sauter, C., **Ng, J.D.**, Benas, P., Le Grimellec, C. and Giege, R. (2001). Growth kinetics, diffraction properties, and effect of agarose on the stability of a novel crystal form of *T. thermophilus* aspartyl-tRNA synthetase-1 *Acta Crystallographica Section D. Acta Cryst. D57*, 552-558.
- Roberts, P.H., Zhou, X., Holmes, A., Ranson, H., Small, G., Hemingway, J., **Ng, J.D.**, Chen, L. and Meehan, E.J. (2001). Multi-form crystallization of agGST1-6, a recombinant glutathione S-transferase from a DDT-Resistant strain of *Anopheles gambiae*. *Acta Crystallographica Section D57:134-136*.
- Marsic, D., Hoover, R.B., Gilinchinsky, D.A. and **Ng, J.D.** (2000). Gene cloning of the 18S rRNA for ancient viable moss from the perma frost of northeastern Siberia. *Proceedings to the International Society for Optical Engineering: Instruments, Methods and Missions for Astrobiology II* . 3755:163-173.
- Lorber, B., **Ng, J.D.**, Lautenschlager, P., and Giegé (2000) Growth kinetics and motion of thaumatin crystals during USML-2 and LMS microgravity missions and comparisons with earth controls. *J. Crystal Growth 208:665-677*.
- Lorber, B., Sauter, C., **Ng, J.D.**, Zhu, D.W., Giege, R., Vidal, O., Robert, M.C. and Capelle. (1999). Characterization of protein and virus crystals by quasi-planar wave X-ray topography: a comparison between crystals grown in solution and in agarose. *J. Cryst. Growth 204:357-368*.
- Sauter, C., **Ng, J.**, Lorber, B., Keith, G., Brion, P., Hosseini, M.W., Lehn, J-M and Giegé, R. (1999). Additives for the crystallization of proteins and nucleic acids. *J. Cryst. Growth 196:365-376*.
- **Ng, J.D.**, Lorber, B., Giegé, R., Koszelak, S., Day, J., Greenwood, A. and McPherson, A. (1997) Comparative analysis of thaumatin crystal grown on earth and in microgravity. *Acta Crystallogra. D53*, 724-733.
- Koszelak, S., **Ng, J.D.**, Day, J., Ko, T.-P. and McPherson, A. (1997). The crystallographic structure of the protease from *Penicillium cyclopium*. *Biochemistry 36* : 6597-6604.
- **Ng, J.D.**, Kuznetsov, Y.G., Malkin, A.J., Keith, G., Giegé, R. and McPherson, A. (1997). Visualization of nucleic acid crystal growth by atomic force microscopy. *Nucleic Acid Research 25* :2582-2588.
- **Ng, J.D.**, Lorber, B., Witz, J., Dietrich-Théobald, A., Kern, D. and Giegé, R. (1996). Crystal growth of macromolecules from precipitation. *J. Crystal Growth 168:50-62*.
- **Ng, J.D.**, Ko, T.-P. and McPherson A. (1993). Cloning, expression and crystallization of jack bean canavalin. *Plant Physiol. 101:713-738*.
- Ko, T.-P., **Ng, J.D.** and McPherson, A. (1993). The three dimensional structure of canavalin from jack bean. *Plant Physiol. 101:729-744*.
- Ko, T.-P., **Ng, J.D.** and McPherson, A. (1993). X-ray structure determination of three crystal forms of canavalin by molecular replacement. *Acta. Crystallogra. D49:478-489*.
- **Ng, J.D.**, Stinchcombe, T.J., Alexander, E and McPherson, A. (1992). The PCR cDNA of Canavalin. *Rice Biotechnology Quarterly 11:33*.
- **Ng, J.D.**, Stinchcombe, T.J., Alexander, E. and McPherson, A. (1992). The PCR cDNA sequence of canavalin reserve protein from *Canavalia ensiformis*. *J. Plant Mol. Biol. 18:147-149*.
- Koszelak, S., Martin, D., **Ng, J.D.** and McPherson, A. (1991). Time lapse microphotography of protein crystal growth. *J.Crystal Growth 110:117-181*.
- **Ng, J.D.** and McPherson, A. (1989). Preliminary crystallographic analysis of proteolytically modified form of *E.coli* Single Stranded DNA Binding Protein. *J. Biomolec. Struct. & Dynam. 6:1071-1076*.
- McPherson, A., Strongin, K., Gibbs, **Ng, J.D.**, Day, J. and Green, M. (1989). The structure of the Vicilin Storage Proteins of Legumes. *J. Cell Biol. 107:411a#2344*.
- Kim, M.H., Nakayama, R., Manos, P., Tomlinson, J.E., Cho, E., **Ng, J.D.** and Holten, K. (1989). Regulation of Apolipoprotein E synthesis and mRNA by diet and hormones. *J. Lipids Res. 30:663-671*.

Complete list of published work in MyBibliography:

http://www.ncbi.nlm.nih.gov/sites/myncbi/1TSF_2nel55kf/bibliography/48950193/public/?sort=date&direction=ascending.

d. Patents

- **Ng, J.D.**, Gavira, J.A., Garcia-Ruiz, J.M., Wells, M., Jenkins, G. Crystallization cassette for the growth and analysis of macromolecular crystals and an associated method. Patent no. **US 7,118,626 B2** Oct 10, 2006.
- Pusey, M.L., Dowell, J., **Ng, J.D.** and Chittur, K. (2007) Nucleic Acid Detector and Method of Detecting Targets within a Sample. Patent no. **US 7,291,459** Nov 11, 2007.

e. Teaching (*while at University of Alabama in Huntsville*)

Didactic classes (sole instructor)

BYS 219 Genetics and Evolution

BYS 361 General Biochemistry I

BYS 362 General Biochemistry I Lab

BYS 363 General Biochemistry II

BYS 365 General Biochemistry II Lab

BYS 519 Gene Structure and Function (Advanced Structural and Molecular Biology)

BYS 543 Molecular Biology of the Cell (Senior & Graduate Level)

BYS 547 Graduate Biochemistry II

BYS 548 Graduate Biochemistry II

BYS 690 Graduate Seminar

BYS 691 Introduction to Synthetic Biology (Special Topics)

BYS 691 Macromolecular Crystallization and X-ray Crystallography (Special Topics)

BYS 691 Recombinant cloning and protein purification (Special Topics)

BYS 691/601/602 Bioinformatics

Non-Didactic classes (specialized instructions-sole instructor)

RNA isolation and analysis

Neutron Diffraction

Thermophilic proteins

Macromolecular crystallization

X-ray crystallography

f. Graduate students and postgraduate fellows mentored

Individuals are named followed by the years in the lab and where they are presently employed. Undergraduate students are not listed.

- Jake Brouwer (M.S. 2017-2019). Paragon Research, Huntsville, AL, US
- Manavalan Gajapathy (Ph.D. 2012 -2017). Hudson Alpha Institute of Biotechnology, AL, US
- James Wolfsberger (M.S. 2013-2015). UAH Doctoral Biotech Program
- Jayson Pagan (M.S. 2013-2015). Nectar, Huntsville, AL, U.S.
- Talitha Holmes (Ph.D. 2007-2013). Research Analyst, Huntsville
- Anuj Singhal (M.S. 2011-2012). iXpressGenes Inc., Huntsville, AL, US
- Domenico De Bernardo (M.S. 2010-2012). UAH Doctoral Biotech Program
- Ronny C. Hughes (Ph.D. 2006-2011). Hudson Alpha Institute of Biotechnology, AL, US
- Miranda Byrne (Ph.D. 2004-2009), Hudson Alpha Institute of Biotechnology, AL, US
- Qunying Yuan (Postdoc 2007-2008), iXpressGenes Inc., Huntsville, AL, US
- Jose A. Gavira (Postdoc 2000-2003) Laboratorio Estadios Cristálograficos, Granda, Spain
- Elena Pikuta (Postdoc 1999-2001), NSSTC, NASA, Huntsville , AL, US
- Damien Marsic (Ph.D. 1999-2006), Florida State University , FL, US
- Divya Pradhan (Ph.D. 2003-2007), Calhoun Community College, Huntsville , AL, US
- Eva Bernhardsdotter (Ph.D. 2003-2005), Swedish Space Coporation, Stockholm, Sweden.
- Tishawn McWilliams (M.S. 2001-2003), Vintage Pharmaceuticals, Huntsville, AL, US
- Ashely Creekmore (M.S. 2002-2004), deciBel Research, Inc. Huntsville, AL, U.

g. Synergistic Activities (*selected*)

- Chair of the *U.S. National Committee for Crystallography, The National Academies* (2014-2017).
- Principal organizer and host of *Frontiers in Structural Biology of Membrane Protein and Pittsburg Diffraction Conference*. Huntsville, AL (2015).
- Primary organizer and host of the 14th *International Conference on the Crystallization of Biological Macromolecules* (2012).
- Past President and current board member of the *Pittsburgh Diffraction Society* (2011-present).

- Instructor for the Protein Crystallography and its Applications to Biomedical Sciences, Universidad Nacional Autonoma de Mexico (UNAM), Mexico City (2012).
- Instructor for the Federation of European Biochemical Societies (FEBS) workshop on the Advanced Methods in Macromolecular Crystallization, Nove Hradý, Czeck Republic (2012).
- Organizing member of the 11th and 12th International Conference on the Crystallization of Biological Macromolecules (August 2006), Montreal, Canada and Cancun, Mexico (May 2008) respectively.
- Assigned Co-editor for the Proceedings to 10th and 12th International Conference on the Crystallization of Biological Macromolecules to be published in Acta Crystallographica Section D. (May 2004, Aug 2008).
- Instructor for Crystallization of Biological Macromolecules Workshop, Uppsala University, Sweden (Summer 2003).

h. Honors, awards, and other Forms of Special Recognition

- 2016 Innovation Award-Biology & Medicine. Protein Crystal Growth Development. International Space Station R&D Conference 2016.
- 2015 Featured as top 101 Rocket City Inventions, U.S. Space & Rocket Center/Smithsonian Institution. (Patent no. US 7,118,626 B2)
- 2014 UAH Outstanding Faculty Award
- 2013 College of Business Administration Entrepreneurs Round Table
- 2011 Martin Luther King, Jr. Award
- 2008 Honor Society of Phi Kappa Phi
- 2002 Foundation Award for Research and Creative Achievement
- 2002 Dean's Service Award, College of Science, University of Alabama in Huntsville
- 2001 Sigma Xi Scientific Research Society, UAH Researcher of the Year
- 1995 French National Centre for Space Studies fellowship
- 1993 French National Organization of Bioindustries (ORGANIBIO) fellowship
- 1998 Walton B. Sinclair Outstanding Teaching Assistant Award

i. Professional organizations and scholarly societies

Phi Kappa Phi
 Sigma Xi Scientific Research Society
 American Crystallographic Association
 Alpha Chi Sigma National Chemistry Fraternity
 International Union of Crystallography

j. Foreign language fluency: French, Spanish, Chinese (in the order of competency)