

Academic Degrees

2001	PhD	Biochemistry and Molecular Biology, University of California, Los Angeles
1996	C Phil	Biochemistry, University of California, Los Angeles
1993	MS	Bioengineering, University of California, San Diego
1990	BS	Applied Physics, Mathematics Minor, & Biomedical Physics Concentration University of California, Irvine

Professional Appointments

2012-	Assistant Professor	Department of Medicine The George Washington University & Division of Renal Diseases and Hypertension Diseases at The GW Medical Faculty Associates
2008-12	Assistant Professor & Core Director	Department of Physiology & Biophysics Case Western Reserve University School of Medicine
2007	Visiting Assistant Professor & Core Director	Department of Physiology & Biophysics Case Western Reserve University School of Medicine

Academic Training

2003	Postdoctoral Associate/Fellow	Departments of Cellular & Molecular Physiology & Cell Biology, Yale University School of Medicine, New Haven <i>Crystal structure of the Nt of sodium-bicarbonate cotransporter NBCe1</i> <i>Crystallographic studies on the Nt of exocytosis factor Sec2p</i>
2001	Postgraduate Researcher	Department of Chemistry & Biochemistry UCLA-DOE Laboratory of Structural Biology & Molecular Medicine, University of California, Los Angeles <i>Purification and control of recombinant human glutamine synthetase</i>
1995	Graduate Student	Department of Chemistry & Biochemistry UCLA-DOE Laboratory of Structural Biology & Molecular Medicine, University of California, Los Angeles <i>Glutamine synthetase from Mycobacterium tuberculosis & Salmonella typhimurium: Illumination of enzymatic mechanism and inhibition</i>
1993	Non-Scripps Graduate Student	Department of Molecular & Experimental Medicine The Scripps Research Institute/University of California, San Diego <i>Elucidation of a novel phosphatase activity from histidine kinase KinA</i>

Funding**Pending Funding**

2015	NIH 1R03DK103003-01, \$100,000 <i>Title: NBCn1 interaction with calcineurin: possible links to RTA and nephrocalcinosis</i>
2015	NSF 1517902, \$1,109,169 <i>Title: Engineering channels for more efficient carbon and boron utilization in plants and animals</i>

Ongoing

2014-

DC D-CFAR Newly Hired Investigator Award (Pilot grant), \$30,000

Department of Medicine; Division of Renal Diseases & Hypertension, The George Washington University, School of Medicine and The Medical Faculty Associates
Title: Epigenetic profile of HIV-positive African Americans with CKD

2013-

Mentored Collaborative Pilot Studies that Promote Integration of Clinical & Research Efforts, \$40,000

Department of Medicine; Division of Renal Diseases & Hypertension, The George Washington University & The Medical Faculty Associates
Title: ApoL1 variants as a tool to predict Chronic Kidney Disease

2009-2014 (no-cost extension through 2016)

NIDDK, NIH K01 Mentored Research Scientist Development Award, \$729,000

2009-12 Department of Physiology and Biophysics, Case Western Reserve University School of Medicine

2012-14 Department of Medicine; Division of Renal Diseases & Hypertension, The George Washington

University School of Medicine and The Medical Faculty Associates

Title: Structure-function studies of the Dimerization of the N-terminal domain of NBCe1-A

Past

2008-2009

DURIP (Navy Award)/Action Fund Match Grant (Ohio Board of Regents), Direct Costs: \$718,000

Department of Physiology and Biophysics, Co-PI
Case Western Reserve University School of Medicine

Title: Case Resources for Protein Crystallization and Cellular/Molecular Biophysics

2007-2008

DURIP (Navy Award)/Action Fund Match Grant (Ohio Board of Regents), Direct Costs: \$652,000

Department of Physiology and Biophysics, Co-PI
Case Western Reserve University School of Medicine

Title: Case Program in the Structural Biology & Physiology of Gas Channels

2006-2008

NIDDK, NIH NRSA Individual Fellowship Award, \$100,000

Department of Cellular and Molecular Physiology
Yale University School of Medicine; Case Western Reserve University School of Medicine

2004

NIH Departmental Training Grant, \$45,000

Department of Cellular and Molecular Physiology
Yale University School of Medicine

Awards

2013 The American Society of Nephrology

Top Oral Abstract, Atlanta, Georgia, USA

Title: Multifunctional role of the variable domain of the sodium-bicarbonate cotransporter NBCe1-A

- 2006 Physiological Society Young Physiologists Bursary Scheme, \$600
Presentation, The Physiological Society, Jul. meeting, London, UK
- 2001 Travel Grant Award, \$1,200
Presentation, Asian Crystallographic Association, Nov. 22-25 meeting, Bangalore, India
- 1999 James D. McCullough Award for Dissertation Research, Honor
Chemistry and Biochemistry Graduation Commencement
University of California, Los Angeles
- 1998 Linus Pauling Prize, \$200
American Crystallographic Association, Jul. 18-23 meeting
Arlington, Virginia, ACA Newsletter, No. 3 (Fall 1998)

Manuscript in preparation

1. **Gill HS**, Kun-Young C, Popratiloff A. (2016) Multifunctional role of the variable V1 domain of the sodium-bicarbonate NBCe1-A cotransporter in trafficking, bicarbonate sensing and transport. *Manuscript in prep.*

Research Articles (Peer-Reviewed)

2. **Gill HS**, Kun-Young C, Kammili L, Popratiloff A. (2015) Rescue of the temperature-sensitive autosomal-recessive mutation R298S in the sodium-bicarbonate cotransporter NBCe1-A characterized by a weakened dimer and abnormal aggregation. *Biochim. Biophys. Acta.* Mar 3;1850(6):1286-1296
3. Tan X, Wang H, Luo G, Ren S, Li W, Cui J, **Gill HS**, Fu S, Lu Y. (2014) A point mutation in DNA polymerase beta enhances DNA repair capability in gastric cancer. *Int J of Biol Sci.*, 2015 Jan 1;11(2):144-55.
4. **Gill HS**, Dutcher LS, Roush ED, Patel S. (2014) Direct evidence for calcineurin binding to the Exon-7 loop of the sodium bicarbonate cotransporter NBCn1. *Int J of Biol Sci.* 10(7):771-776.
5. **Gill HS**, Dutcher LS, Boron WF, Patel S, Guay-Woodford LM (2013) X-ray diffraction studies on merohedrally-twinned $\Delta 1-62\text{NtNBCe1-A}$ crystals of the Na-HCO₃ cotransporter. *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 69 (Pt 7):796-799.
6. Liu Y, Qin X, Wang D, Guo Y, **Gill HS**, Morris N, Parker MD, Chen L, Boron WF (2013) Effects of alternative structural elements, including two alternative amino termini and a new splicing cassette IV, on the function of NBCn1. *J Physiol.* 591(Pt 20):4983-5004.
7. **Gill HS** (2012) pH-sensitive self-associations of the cytoplasmic, N-terminal domain of the NBCe1-A cotransporter suggest a compact conformation under acidic intracellular conditions. *Protein Pept Lett.* 19(10):1054-1063.
8. **Gill HS** (2010) Evaluating the efficacy of tryptophan fluorescence and absorbance as a selection tool for identifying protein crystals. *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 66(Pt 3):364-372.
9. Chen LM, Kelly ML, Parker MD, Bouyer P, **Gill HS**, Felie JM, Davis BA Boron WF (2008) Expression and localization of Na⁺-driven Cl-HCO₃ exchanger (SLC4A8) in rodent central nervous system. *Neuroscience*, 153(1):162-174.
10. Chen LM, Kelly ML, Rojas JD, Parker MD, **Gill HS**, Davis BA, Boron WF (2008) Use of a new polyclonal antibody to study the distribution and glycosylation of the sodium-coupled bicarbonate transporter NCBE in rodent brain. *Neuroscience*, 151(2):374-385.

11. **Gill HS** (2007). Structural insights into the exchange domain of Sec2p: expression, purification, and preliminary X-ray diffraction analysis. *Protein Pept Lett.* 14(3):253-258.
12. **Gill HS**, Boron WF (2006) Expression and purification of the cytoplasmic N-terminal domain of the Na/HCO₃ cotransporter NBCe1-A: Structural insights from a generalized approach. *Protein Expr Purif.* 49(2):228-234.
13. **Gill HS**, Boron WF (2006) Preliminary X-ray diffraction analysis of the cytoplasmic N-terminal domain of the Na/HCO₃ cotransporter NBCe1-A. *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 62(Pt 6):534-537.
14. Lu J, Daly C, Parker MD, **Gill HS**, Piermarini PM, Pelletier MF, Boron WF (2006) Effect of human carbonic anhydrase II on the activity of the human electrogenic Na/HCO₃ cotransporter NBCe1-A in *Xenopus* oocytes. *J Biol Chem.* 281(28):19241-19250.
15. **Gill HS**, Pfluegl GMU, Eisenberg D (2002) Multicopy crystallographic refinement of glutamine synthetase from *Mycobacterium tuberculosis* highlights flexible loops in enzymatic mechanism. *Biochemistry.* 41(31):9863-9872.
16. **Gill HS**, Eisenberg D (2001) Crystal structure of phosphinothricin in the active site of glutamine synthetase illuminates mechanism of enzymatic inhibition. *Biochemistry.* 40(7):1903-1912.
17. **Gill HS**, Pfluegl GMU, Eisenberg D (1999) Preliminary crystallographic studies on glutamine synthetase from *Mycobacterium tuberculosis*. *Acta Crystallogr D Biol Crystallogr.* 55(Pt 4):865-868.

Review Articles (Peer-Reviewed)

1. Wing MR, Ramezani A, **Gill HS**, Devaney JM, Raj DS (2013) Epigenetics of progression of chronic kidney disease: fact or fantasy? *Semin Nephrol.* 33(4):363-374.
2. Goulding CW, Perry LJ, Anderson D, Sawaya MR, Cascio D, Apostol MI, Chan S, Parseghian A, Wang SS, Wu Y, Cassano V, **Gill HS**, Eisenberg D (2003) Structural genomics of *Mycobacterium tuberculosis*: a preliminary report of progress at UCLA. *Biophys Chem.* 105(2-3):361-370.
3. Terwilliger TC, Park MS, Waldo GS, Berendzen J, Hung LW, Kim CY, Smith CV, Sacchettini JC, Bellinzoni M, Bossi R, De Rossi E, Mattevi A, Milano A, Riccardi G, Rizzi M, Roberts MM, Coker AR, Fossati G, Mascagni P, Coates AR, Wood SP, Goulding CW, Apostol MI, Anderson DH, **Gill HS**, Eisenberg DS, Taneja B, Mande S, Pohl E, Lamzin V, Tucker P, Wilmanns M, Colovos C, Meyer-Klaucke W, Munro AW, McLean KJ, Marshall KR, Leys D, Yang JK, Yoon HJ, Lee BI, Lee MG, Kwak JE, Han BW, Lee JY, Baek SH, Suh SW, Komen MM, Arcus VL, Baker EN, Lott JS, Jacobs W Jr, Alber T, Rupp B (2002) The TB structural genomics consortium: a resource for *Mycobacterium tuberculosis* biology. *Tuberculosis.* 83(4):223-249.
4. Goulding CW, Apostol M, Anderson DH, **Gill HS**, Smith CV, Kuo MR, Yang JK, Waldo GS, Suh SW, Chauhan R, Kale A, Bachhawat N, Mande SC, Johnston JM, Lott JS, Baker EN, Arcus VL, Leys D, McLean KJ, Munro AW, Berendzen J, Sharma V, Park MS, Eisenberg D, Sacchettini J, Alber T, Rupp B, Jacobs-Jr. W, Terwilliger TC (2002) Providing a Structural Foundation for Drug Discovery. *Curr Drug Targets Infect Disord.* 2(2):121-141.
5. Eisenberg D, **Gill HS**, Pfluegl GMU, Rotstein SH (2000) Special Issue on Proteolytic Enzymes and Inhibitors: Structure-function relationships of glutamine synthetase. *Biochim Biophys Acta, Protein Struct Mol Enzymol.* 1477:122-145.

Oral Presentations

1. **Gill HS** (Sept. 2014) Hotdogs and an alternative pathway for NO generation to prevent decompression sickness.
2. **Gill HS** (Nov. 2013) Multifunctional Role of the N-Terminal Variable (V1) Domain of the Sodium-Bicarbonate Cotransporter NBCe1-A: Patch Formation, Trafficking and Gating. Top Oral Abstract at The American Society of Nephrology, Atlanta, GA.
3. **Gill HS** (Aug. 2011) Structural and biophysical characterization of a renal bicarbonate cotransporter. Seminar at The George Washington University School of Medicine.
4. **Gill HS** (Jul. 2011) Structural and biophysical characterization of a renal bicarbonate cotransporter. Seminar at the University of Southern California School of Medicine.
5. **Gill HS** (Mar. 2011) Structural and biophysical characterization of a renal bicarbonate cotransporter. Seminar at the Mount Sinai School of Medicine.
6. **Gill HS** (Apr. 2010) Part I. Crystal structure the N-terminal, cytoplasmic domain of NBCe1. Part II. Trends in Biophysical Science. Seminar at Guru Nanak Dev University, Amritsar, Punjab, India.
7. **Gill HS** (Mar. 2008) Crystal structure determination of the N-terminal domains of the SLC4 family members and their binding partners. Seminar at Case Western Reserve University, Cleveland, OH.
8. **Gill HS** (Feb. 2007) Crystal structure determination of the N-terminal domain of the NBCe1-A. Seminar at Yale School of Medicine, New Haven, CT.
9. **Gill HS**, Dutcher LS, Parker MD, Boron WF. (Jul. 2006) Identification and cloning of alternative N termini of human NBCn1: Implications. The Physiological Society, Presented at University College London Proc Physiol Soc 3, C20.
10. **Gill HS**, Eisenberg D. (Nov. 2001). Multicopy crystallographic refinement of glutamine synthetase highlights flexible loops in enzymatic mechanism. Talk at the International Symposium on Crystallography and Bioinformatics in Structural Biology meeting, Bangalore, India.
11. **Gill HS**, Eisenberg D. (Mar. 2001). Multicopy crystallographic refinement of glutamine synthetase highlights flexible loops in enzymatic mechanism. Talk at the West Coast Protein Crystallography Workshop, Asilomar, CA.
12. **Gill HS**. (Jul. 1998). Glutamine synthetase from *Mycobacterium tuberculosis*: Aim toward drug discovery. Talk at the American Crystallographic Association meeting, Arlington, VA.

Abstracts

1. The auto-recessive mutation R298S of the sodium bicarbonate cotransporter NBCe1-A leads to a trafficking defect that underlies proximal renal tubule acidosis and myriad ocular pathologies. (2014) Choi K, Popratiloff A, **Gill HS**. American Society of Nephrology, San Diego, CA. *J Am Soc Nephrol*. Nov 12 Fri-PO050.
2. The auto-recessive mutation R298S of the sodium bicarbonate cotransporter NBCe1-A leads to a trafficking defect that underlies proximal renal tubule acidosis and myriad ocular pathologies. (2014) Choi K, Popratiloff A, **Gill HS**. (Jun. 11, 2014) NKF's Research Fellow Forum, Washington D.C.

3. Structural Model of Bicarbonate Sensing and Transport by the Sodium-Bicarbonate Cotransporter NBCe1-A & Deciphering Twin Fractions of Merohedrally-twinned $\Delta 1$ -62NtNBCe1-A Crystals. (2013) **Gill HS**, Popratiloff A, (Jul. 20-24, 2013) American Crystallographic Society, Hawaii. 01.00.90
4. Multifunctional role of the variable domain of the sodium-bicarbonate cotransporter NBCe1-A. (2013) Watkins C, Ramezani A, Popratiloff A, **Gill HS**. (Jun. 12, 2013) NKF's Research Fellow Forum, Washington D.C.
5. Multicopy Crystallographic & Biophysical Analyses of the N-terminal Domain of NBCe1-A: Illumination of the Human R298S Mutational Defect. (2012) **Gill HS**. American Society of Nephrology, San Diego, CA. *J Am Soc Nephrol*. Nov 23 Fri-PO071.
6. Association of Placental Growth Factor with Chronic Kidney Disease Progression and Mortality: CARE FOR HOME Study. (2012) Rambod M, Seiler S, Rogacev KS, Fliser D, Patel S, Dwivedi R, Ramezani A, **Gill HS**, Raj DS, Heine GH. American Society of Nephrology, San Diego, CA. *J Am Soc Nephrol*. Nov 23 Thu-PO312.
7. Vascular Endothelial Growth Factor Is Associated with Higher Mortality in Chronic Kidney Disease: CARE FOR HOME Study. (2012) Rambod M, Seiler S, Rogacev KS, Fliser D, Patel S, Dwivedi R, Ramezani A, **Gill HS**, Raj DS, Heine GH. American Society of Nephrology, San Diego, CA. *J Am Soc Nephrol*. Nov 23 Thu-PO313.
8. Crystal Structure & Biophysical Studies of the N-terminal Domain of NBCe1-A: Illumination of the Human R298S Mutational Defect. (2012) **Gill HS**. The Protein Society Meeting, San Diego, CA. V21(51) Aug 2012 P265.
9. pH-sensitive monomer-dimer equilibrium and self-association of the cytoplasmic, N-terminal domain of the NBCe1-A cotransporter (2011) **Gill HS**. Biophysical Society Annual Meeting, Baltimore, MD. *Biophysical Journal*, vol. 100, issue 3, pp. 244a.
10. The use of tryptophan in structural genomics (2009) **Gill HS**. American Crystallographic Association meeting in Toronto, Canada.
11. Crystal structure of the cytoplasmic N-terminal domain of the Na/HCO₃ cotransporter NBCe1-A at 2.4 Å resolution illustrates extended, flexible docking regions for regulatory protein binding partners. (2007) **Gill HS**, Dutcher LS, Boron WF. Biomedical Transporters, Bern, Switzerland P16 p. 52.
12. Identification, cloning, expression, and purification of new splice variants of the cytoplasmic, N terminal of human NBCn1. (2007) Dutcher LS, **Gill HS**, Boron WF. Yale Undergraduate Research Symposium Apr. 20, 2007. Third prize winner.
13. Characterization of a polyclonal antibody directed against the amino terminus of the Na⁺-driven Cl-HCO₃ exchanger (NDCBE). (2006) Kelly ML, Chen L, Davis BA, Bouyer P, **Gill HS**, Parker MD, Piermarini PM, Boron WF. Society For Neuroscience meeting, Atlanta, GA.
14. Identification and cloning of alternative N termini of human NBCn1. (2006) **Gill HS**, Dutcher LS, Parker MD, Boron WF. *Proceedings of The Physiological Society*, University College London, UK, C20, p. 11 (244534) Jul. 5-7 2006.
15. Characterization of a polyclonal antibody directed against the amino terminus of the sodium-coupled bicarbonate transporter NCBE. (2006). Chen L, Rojas J, Davis B, **Gill HS**, Parker MD, Boron WF. Experimental Biology meeting, San Francisco, CA. *FASEB J*. 20(5): A842-A842 Part 2, Mar. 7 2006.

16. Effect of human carbonic anhydrase II on the activity of the human electrogenic Na/HCO₃ cotransporter NBCe1-A in *Xenopus* oocytes. (2006) J, Daly C, Parker MD, **Gill HS**, Piermarini PM, Pelletier MF, Boron WF. *FASEB J.* 20(5): A842-A842 Part 2 Mar. 7 2006. American Physiological Society, Experimental Biology meeting, San Francisco, CA.
17. Cloning, expression, and purification of a recombinant carbonic anhydrase from a lower vertebrate. (2005) Piermarini PM, **Gill HS**, Boron WF. Experimental Biology meeting, San Diego, CA.
18. New purification scheme of human brain glutamine synthetase eliminates broad and multiple high-order bands on native gels. (2001) **Gill HS**, Eisenberg D. *Protein Sci.* 11(1), 207, 2002 Protein Society meeting, San Diego, CA.
19. Multicopy crystallographic refinement of a relaxed glutamine synthetase from *Mycobacterium tuberculosis* highlights flexible loops in enzymatic mechanism. (2001) **Gill HS**, Pfluegl GMU, Eisenberg D. Asian Crystallographic Association, Nov. 22-25, Bangalore, India
20. The structure of phosphinothricin in the active site of glutamine synthetase illuminates mechanism of enzymatic inhibition. (1991) **Gill HS**, Pfluegl GMU, Eisenberg D. *Protein Science* Vol. 8, 1, 68 1-T, p. 172.
21. Glutamine synthetase from *Mycobacterium tuberculosis*: Aim toward drug discovery. **Gill HS**, Pfluegl GMU, and Eisenberg D. (1998) American crystallographic association, Vol. 25, Series 2, 96, P028 Jul. 18-26 Arlington, VA.
22. Glutamine synthetase from *Mycobacterium tuberculosis*: Aim toward drug discovery. **Gill H**, Eisenberg D. Brookhaven National Laboratory R&D Database, National Synchrotron Light Source Beamline X12B Abstract No. GIX.
23. How to avoid overfitting in refinement of structures with approximate noncrystallographic symmetry. High resolution structure refinement of glutamine synthetase reveals evidence for homotropic cooperative binding. (1996) Pfluegl GMU, **Gill HS**, Eisenberg D. IUCR, Vol. 24, Series 3, PS04.17.32, page C-238, Aug. 12-18, Seattle, WA.
24. Inhibitors of glutamine synthetase from *Salmonella typhimurium* and *Mycobacterium tuberculosis*. (1996) **Gill HS**, Harth G, Horwitz M, Eisenberg D. IUCR, Vol. 24, Series 3, PS04.01.73, page C-1 14, Aug. 12-18, Seattle, WA.
25. Structural and biochemical evidence for positive homotropic modulation in glutamine synthetase. (1996) **Gill HS**, Pfluegl GMU, Eisenberg D. *Protein Science* Vol. 5 Suppl. 1, 390-T, page 125.

Biotechnology and Educational Workshops and Training

2011 Nov. 16-17, NIH Professional Development workshop, ASN meeting, Denver, CO

2010 Oct. 25-29, Advanced Fluorescence Imaging and Dynamics by Laboratory for Fluorescence Dynamics, UCI, CA

2010 Oct. 18-19, International Light Scattering Colloquium, Santa Barbara, CA

2010 Jun. 1-6, Freedom EVOware Standard Liquid Handling Robot Training by Tecan, Männedorf, Switzerland

2010 May 4-7, Biacore Training by GE Healthcare, La Jolla, CA

2009 Nov. 19-20, Dynamic Light Scattering University by Wyatt Technologies, Santa Barbara, CA

2009 Oct. 19-20, International Light Scattering Colloquium, Santa Barbara, CA

2009 Jul. 14-15, NIH Cores meeting, Bethesda, MD

2009 May 12-14, MALS Light Scattering University by Wyatt Technologies, Santa Barbara, CA

Cover Illustrations

The PECC: Crystal Clear Results. **HS Gill**. The Tecan Journal (2011).

Molecule of the Month: Glutamine synthetase. By David Goodsell. Protein Databank Newsletter No. 14, Summer 2003.

Atomic model of glutamine synthetase from *Mycobacterium tuberculosis*: Special Issue. Dedicated to ER Stadtman. David Eisenberg, **HS Gill**, Gaston MU Pfluegl. Archives of Biochemistry and Biophysics, 397(2) Jan. 15, 2002.

Glutamine synthetase from *Mycobacterium tuberculosis*. **HS Gill**, David Eisenberg. DOE at UC Newsletter, (Winter 2000) Deconstructing Tuberculosis.

Glutamine synthetase from *Mycobacterium tuberculosis*: Aim toward drug discovery. **HS Gill**, Gaston MU Pfluegl, David Eisenberg. ACA Newsletter, No. 4 (Fall 1998) Molecular packing description.

Service Activities/Laboratory Setups

2010: Hosted Biacore T-100 workshops (5/20-21, 8/25-26, 10/11) for the Midwestern regional states at CWRU

2010: Organizer & funding advocate for the Ohio Physiology Society meeting at the Hyatt Regency, Cleveland

2008-present: Ad hoc reviewer, *Acta Cryst.*

2008-2010: Assistant Editor, *Protein Pept Lett.* (Columbia Univ.)

2007-2012: Creator & Director, The Protein Expression Purification Crystallization Core (PEPCC at CWRU-SOM) <http://pepcc.case.edu>

2007-2012: Experience in high-end instrumentation purchases and in their usage:

GE LIFESCIENCES

-Biacore T-100 (Surface Plasma Resonance), 2-year Contract (DURIP and Institution, \$359K)

-Akta Explorer A-100 (High Pressure Chromatography) (DURIP, \$80K)

BECKMANN COULTER

JA-XPI high-speed centrifuge with five rotors for specialized applications, (DURIP, \$48K)

WYATT TECHNOLOGIES

-Dynapro Dynamic Light Scattering (Ohio Board of Regents Action Fund, \$35K)

-Optipex Refractive Index Detector (Ohio Board of Regents Action Fund, \$25K)

-Dawn Heleos Multiangle Light Scattering (Ohio Board of Regents Action Fund, \$58K)

LIQUID HANDLERS FOR CRYSTALLIZATION

- Tecan Evo 150 (Dispenser, Aspirator, Mixer) (DURIP, \$210K)
- HydraDT (Dispenser and Aspirator) (Ohio Board of Regents Action Fund, \$20K)
- TTPLabTech The Mosquito (Low-volume Drop Setter) with seven cartridges, 2-year Contract (Ohio Board of Regents Action Fund, \$125K)
- Formulatrix_RockImager-500 (Robotic Imager/Incubator), 2-year Contract (Ohio Board of Regents Action Fund, \$185K)

SPECIALIZED MICROSCOPY

Leica M205A Stereomicroscope with Fusion Optics (Ohio Board of Regents Action Fund, \$53K)

CULTURE EQUIPMENT

- Two Power Scientific Protein Chambers (DURIP, \$16K)
- Bellco High-capacity Incubator (DURIP, \$8K)
- Labline Refrigerated Shaker (Yale, \$9K)

CRYSTALLOGRAPHIC GRAPHICS COMPUTERS

-Linux boxes capable of 3D-graphics for model building (Ono or Coot) (Yale, K01, \$1.5K each)

2007-2010: Departmental Web Production Editor, Web Designer, and Web Server Manager

2007-2010: High-end Instrumentation Purchases for Departmental Infrastructure (Committee Member, DPB)

GE-LIFESCIENCES

- Typhoon Plus (Fluorescent Scanner) \$120K
- Microcal ITC (Isothermal Calorimetry) \$120K

BECKMANN COULTER

Six JE high-speed centrifuges with 15 rotors and one Optima X-100 ultra-centrifuge with 6 rotors, two tabletops including: price negotiation/reduction of service contracts of new and previous equipment for 4 years (\$299K)

Teaching Experience

Case Western Reserve University

2008-2012: PHOL 475 (Spring), ADVANCED PROTEIN BIOPHYSICS: Membrane Protein-Lipid Interactions

2008-2012: PHOL 530 (Fall), ADVANCED TECHNIQUES IN PHYSIOLOGICAL AND BIOPHYSICAL SCIENCES: X-ray Crystallographic Concepts

The George Washington University Medical Faculty Associates

2014-2015: CARDIOVASCULAR-PULMONARY-RENAL PHYSIOLOGY BLOCK,
RENAL, Biochemistry of Transporters
RENAL, Renal Filtration

Individual Medical Students Mentored at Yale, CWRU, and GWU

Kun-Young Rachel Choi, MD
Summer 2014
Gill-Fellowship Recipient
2nd year Resident at GWU

GWU/MFA

Casey Watkins, MD
Summer 2013
NKF Oral Award Recipient
4th year Resident at GWU
GWU/MFA

Talal Alzahrani, MD
Spring 2012 to Summer 2013
Applying for Residency in the U.S.
GWU/MFA

Abeer Alfaraj, MD
Fall 2012 to Summer 2013
Applying for Residency in the U.S.
The George Washington University/MFA

Vince Shanmugavel
Spring 2008 to Fall 2008
Major/Interests: Biology, Indian Student Association
Case Western Reserve University, OH

Lauren S. Dutcher
Spring 2006 to 2008
Yale Poster Award Recipient
Major/Interests: Molecular Biology & Biochemistry, Field Hockey
Yale University, CT

Jillian M. Felie
Summer 2006 to Fall 2006
Dec. 2006 to Jan. 2007
Major/Interests: Biology, Alpha Phi Rush
Rensselaer Polytechnic Institute, NY

References

Available Upon Request