

HOLLY A. SHILL M.D.

Banner Sun Health Research Institute

CURRENT POSITIONS

Director, Thomas H. Christopher Center for Parkinson's Research, Sun Health Research Institute, Sun City Arizona, October, 2006- present

Staff physician, Sun Health Neuroscience Associates, October 2006-present.

Neurology staff privileges, Banner Boswell Hospital, October 2006-present

Clinical Faculty/Adjunct. Center for Adaptive Neural Systems, Arizona State University, January 2008-present.

Adjunct Associate Professor, Podiatric medicine, Midwestern University, October 2008- present.

EDUCATION

Clinical Associate (fellowship position), Human Motor Control Section, Medical Neurology Branch, National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, MD, January 2000-May 2002.

- Fellows Award for Research Excellence (FARE)- 2002

FAES Graduate School, National Institutes of Health, Bethesda, MD, September 2000-May 2001. Statistics course.

Fellow, Movement Disorders, Barrow Neurological Institute

Phoenix, Arizona, July 1999-December 1999

Residency, Neurology, Barrow Neurological Institute, Phoenix, Arizona, July 1996- June 1999

- chief resident, July 1998- June 1999
- American Academy of Neurology Resident Scholarship, 1999

Internship, Internal Medicine, St. Joseph's Hospital and Medical Center, Phoenix, Arizona, June 1995-June 1996

M.D., University of Arizona College of Medicine, Tucson, Arizona, July 1991- May 1995

- Alpha Omega Alpha
- Dean's Scholarship- full tuition/room/board (4 years)
- USMLE Scores: 234, 251, 256
- American Medical Women's Association, Inc., Janet M. Glasgow Memorial Achievement Citation

B.S., University of Arizona, Tucson, Arizona, August 1987- May 1991

Major: Electrical Engineering

- Magna Cum Laude with Honors
- Cumulative G.P.A. 3.78
- National Merit Scholar (4 years)
- Honors Academic Scholarship- full tuition (4 years)
- Eta Kappa Nu, National Electrical and Computer Engineering Honors Society
- Baird Scholarship (2 years)

PRIOR EMPLOYMENT

Director, Muhammad Ali Parkinson Center, August 2005-Sept 2006.

Movement disorder faculty neurologist, Barrow Neurology Clinics, Barrow Neurological Institute, July 2003- September 2006.

Acting director, Muhammad Ali Parkinson Research Center, June 2003-March 2004.

Neurologist, private practice, affiliated with Barrow Neurological Institute and Muhammad Ali Parkinson Research Center, July 2002-July 2003.

Neurology faculty attending, Barrow Neurological Institute, Neurology residency program, July 2002-2006.

Clinical Research Associate, Barrow Neurological Institute, July 2002-July 2003.

OTHER EXPERIENCE

Mentor, University of Arizona College of Medicine Scholarly Project student. June-2009-present.

Advisor, American Medical Association and American Academy of Neurology CPT coding meeting June 2009/ RUC meeting October, 2009.

Consultant, Ipsen Pharmaceuticals National Advisory Board, San Francisco, CA, Nov 15, 2008.

Advisory Consultant, Allergan advisory board, Chicago, IL. June 22, 2007.

Speaker's bureau, Botox, Allergan Neurosciences, 2008, 2009.

Consultant, Teva Roundtable, Teva Neuroscience, Phoenix, AZ, April 9, 2008.

Roundtable discussion, Medtronic, San Francisco, CA, 2008.

Consultant, Editorial advisory board, Boehringer- Ingelheim. Santa Monica, CA, Oct. 5, 2007.

Consultant, Scientific Advisory Board, Teva Neuroscience, Phoenix, AZ, May 24, 2007.

Consultant, Xenazine Advisory Board, Prestwick Pharmaceuticals, Dallas, TX, November 17, 2006.

Invited junior faculty participant, Consensus Conference on Essential Tremor, Washington DC. October 21-22, 2005.

Examiner, American Board of Psychiatry and Neurology

Mentor, summer student research program, Barrow Neurological Institute, 2003, 2004.

Ad hoc reviewer, Journal of Clinical Neurophysiology.

Ad hoc reviewer, Movement Disorders

Ad hoc review, Neurology

Ad hoc review, European Journal of Neurology

Consultant, Medical Advisory Board, UCB Pharma, Inc, 2002.

Mentor, Howard Hughes Medical Institute Pre-College Science Education Program, 2001.

Mentor, summer student program, National Institute of Neurological Disorders and Stroke, 2000, 2001.

PRESENTATIONS

Parkinson's disease. Lecture to geriatric fellows, Boswell Hospital, Sun City, AZ. 2/18/2010.

Early diagnosis and treatment of Parkinson's disease: a continuing pursuit. CME Lecture, Scottsdale, AZ 12/8/2009.

Update on Parkinson's disease. CME Grand Rounds, VA Medical Center, Phoenix, AZ 12/4/2009.

Update on Parkinson's disease. CME Grand Rounds, Good Samaritan Regional Medical Center, Phoenix, AZ 12/4/2009.

Pharmacy Practice and Parkinson's disease. CE lecture, Albuquerque, NM September 28, 2009

Pharmacy Practice and Parkinson's disease. CE lecture, Phoenix, AZ September 30, 2009

Update in Parkinson's. CME lecture/roundtable. Arizona Neurological Society, Sedona, AZ. August 1, 2009.

Cutting edge 2009: Research Updates in Neurology, CME lecture, Albuquerque, NM June 22, 2009.

Movement disorder for the primary care physician, CME lecture for geriatric fellows, Boswell Medical Center, Sun City, AZ, June 18, 2009.

Botulinum neurotoxin and muscle overactivity: A case- based approach to improving patient care in the Upper Motor Neuron Syndrome. CME workshop, Postgraduate Institute for Medicine and the Neurotoxin Institute, Tempe, AZ, October 11, 2008.

Botulinum toxin workshop. CME lecture, Arizona Neurological Society Summer Conference, Sedona, AZ, August 3, 2008.

Parkinson's roundtable discussion. CME lecture, Arizona Neurological Society Summer Conference, Sedona, AZ, August 2, 2008.

Dystonia, CME lecture, Boswell Hospital Grand Rounds, Sun City, AZ, May 6, 2008.

Parkinson's disease. CME lecture, Boswell Hospital Grand Grounds, Sun City, AZ, March 24, 2008.

Dystonia. CME lecture, BNI symposium, Barrow Neurological Institute. Phoenix, AZ, March 15, 2008.

Tremors in the elderly. CME lecture, "Achieving Excellence in Geriatric Care", 19th Annual Symposium, Arizona Geriatrics Society, Phoenix, AZ, Nov 2, 2007

Tremors in the elderly. CME lecture, Boswell Hospital Grand Grounds, Sun City, AZ, Aug 28, 2007

Lifelong management of Parkinson's disease; early treatment options. CME lecture. Scottsdale, AZ. May 23, 2007.

Tremors in the elderly. CME lecture, Greenville Post-Graduate Seminar, Greenville, SC, April 19, 2007.

Drug-induced movement disorders. CME lecture to geriatric fellows. Boswell Hospital, Sun City AZ, January 3, 2007.

Diagnosis and treatment of tremor. CME lecture to geriatric fellows. Boswell Hospital, Sun City, AZ. November 9, 2006.

Medication 101. Parkinson's progress. Creighton University, Omaha, NE, August 25, 2006.

Childhood hypertonina. Pediatric Neuroscience Grand Rounds. Barrow Neurological Institute. June 5, 2006.

Diagnosis and treatment of tremor. BNI symposium, March 3, 2006.

Modern use of botulinum toxin. BNI symposium, March 2, 2006.

Drug-induced movement disorders. Neurology Grand Rounds, University of Arizona, October 21, 2005.

The biology of botulinum toxin and its use in movement disorders, Barrow Symposium, Barrow Neurological Institute, February 2005.

Tic and Tourette syndrome, BNI Symposium, Barrow Neurological Institute, March, 2004

Studies in essential tremor, Barrow Neuroscience Conference. February, 2004.

Studies in essential tremor, Mayo Clinic Neuroscience Conference, Mayo Clinic Scottsdale, January, 2004.

Tic and Tourette syndrome, Pediatric Neurology Symposium, Barrow Neurological Institute, October, 2003

Faculty, Advanced treatment of dystonia and spasticity. Workshop demonstrating the use of botulinum toxin, Denver, CO, October 2003.

Physiology of free-will, Neurology/ Neurosurgery Grand Rounds, Barrow Neurological Institute, 2002.

Faculty, Treatment of dystonia: workshop demonstrating the use of botulinum toxin, Washington DC, 2002.

CURRENT RESEARCH

1R21HD060315-01A2 (Krishnamurthi)

09/23/08 – 08/31/10

NIH-NCMRR/NICHD

Exercise training in Parkinson's disease: Neural and functional benefits

The goal of this study is to investigate the effects of 12-week regular polestriding exercise training on alleviating the severity of Parkinson's symptoms. This study will also explore any changes in brain metabolic activity due to regular physical activity. Role: Co-investigator

Michael J. Fox Foundation/ Kalaco Scientific. A Randomized, Double-Blind, Trial of Nexalin[®] vs. Placebo in Subjects with Early Parkinson's Disease. 8/2008-present. Role: Principal Investigator. The goal of this study is to investigate a non-invasive device to improve motor and non-motor symptoms in PD.

Chelsea Therapeutics, Inc. A phase III, multi-center, double-blind, randomized, placebo-controlled, parallel-group withdrawal design study to assess the clinical effect of droxidopa in subjects with primary autonomic failure, dopamine beta hydroxylase deficiency or non-diabetic neuropathy and symptomatic neurogenic orthostatic hypotension. 2/08-present. Role: Local Principal Investigator.

Arizona Chapter of the National Parkinson Foundation/Sun Health Research Institute. A pilot study of blood biomarkers for Parkinson's disease. 12-07-present. Lih-Fen Lue (PI). Role: Co-Investigator.

Parkinson's Study Group and NIH: RO1NS050324-01A1. Effects of Coenzyme Q10 in Parkinson Disease – Phase 3. 12/08- present. Role: Local Principal Investigator.

Parkinson Study Group and National Institutes of Health, Cephalon and H. Lundbeck A/S. A longitudinal Observational Follow-up of the PRECEPT Study Cohort (PostCEPT). 8/06-present. Role: Local Principal Investigator.

Michael J Fox Foundation. Arizona Parkinson Disease Center: Prescott Initiative. 10/1/2006-9/30/2011. Role, Local PI.

Arizona Biomedical Research Commission. Arizona Parkinson Disease Center Prevention of Progression to Parkinson's Disease and Parkinson's Disease with Dementia: Development of Biomarkers and Novel Treatment Strategies. 10/31/05-10/30/09. Role: Clinical Core Investigator.

COMPLETED RESEARCH

International Essential Tremor Foundation. Brain catecholamine system in essential tremor. 7/1/08-6/30/09. Role: Principal Investigator. The goal of this study is to investigate change in the brainstem and cerebellar neurochemical system in autopsied subjects with ET.

Schering-Plough Research Institute. A Phase 2, 36-Week, Open Label Uncontrolled Safety Follow-Up Study Assessing SCH 420814 5 mg BID. 8/08- present. Role: Local Principal investigator. A study in advanced PD with motor fluctuations.

Boehringer-Ingelheim. Long-term safety study of open-label pramipexole extended release (ER) in patients with early Parkinson's disease. 6/08-present. Role: Local Principal Investigator.

Schering-Plough Research Institute. A phase 2, 12-week, double-blind, dose-finding, placebo-controlled study to assess the efficacy and safety of a range of SCH 420814 doses (1 mg, BID, 2 mg BID, 5 mg BID and possibly 10 mg BID) in subjects with moderate to severe Parkinson's disease experiencing motor fluctuations and dyskinesias. 12/07-12/08. Role: Local Principal Investigator.

Sun Health Research Institute. The peripheral circulation system marker for AD/PD study. 9/2007-present. Yong Shen (PI). Role: Co-Investigator.

Department of Defense. Blood Alpha-Synuclein, Gene Expression, and Smell testing as diagnostic and Prognostic Biomarkers in Parkinson's Disease (PROBE). 8/07- 11/08. Role: Local Principal Investigator.

Boehringer-Ingelheim. A double-blind, double dummy, placebo-controlled randomized, three parallel groups study comparing the efficacy, safety and tolerability of Pramipexole ER versus placebo versus Pramipexole IR administered orally over a 26-week maintenance phase in patients with early Parkinson's disease (PD). Phase 3. 7/07-12/08. Role: Local Principal Investigator.

Boehringer-Ingelheim. A cross-sectional, retrospective screening and case-control study examining the frequency of, and risk factors associated with, impulse control disorders in Parkinson's disease treated with Mirapex and other anti-parkinson agents (DOMINION study). 10/06-02/08. Role: Local Principal Investigator.

NIH: 2R01NS036711-05A2. 9/30/97-7/31/07. Genetic Linkage Study in Parkinson's Disease (GenePD). Richard Myers (PI). Role: Local Principal Investigator.

Barrow Neurological Foundation. Parkinson's Disease Registry: a long-term study. 7/1/03-6/30/06. Role: Principal Investigator.

Merck KgaA. An open-label, multicenter, multinational Phase III follow-up study to investigate the long-term safety of Sarizotan HCl 1 mg BID in patients with Parkinson's disease suffering from treatment-associated dyskinesia. (PADDY-O). 7/05-7/06. Role: Principal Investigator

Kyowa Pharmaceutical, Inc. A long-term, multicenter, open-label safety study with oral 20 or 40 mg/d doses of KW-6002 (Istradefylline) as treatment for Parkinson's disease in patients with motor response complications on levodopa therapy. 12/04-2/05. Role: Co-Principal Investigator.

Merck KgaA. A double-blind, placebo-controlled, multinational Phase III study to evaluate the safety and efficacy of Sarizotan HCl 1 mg BID in patients with Parkinson's disease suffering from treatment-associated dyskinesia. (PADDY-2). 12/04-2/06. Role: Principal Investigator

Parkinson Study Group and Cephalon. PRECEPT. A randomized, double-blind, placebo-controlled, dose-finding study to assess the efficacy and safety of CEP-1347 in patients with early Parkinson's disease. 3/03-7/06. Role: Principal Investigator.

NIH: R01NS40266-02. 3/15/02-2/28/04. Bradykinesia in Parkinson's disease. George Stelmach (PI). Role: Consultant.

NIH: 1U10NS044458-01. 9/30/02-8/31-07. Parkinson's Disease Neuroprotection Trial (NET-PD). Holly Shill (PI). Role: Co-Investigator.

Barrow Neurological Foundation. 7/01/02-6/30/04. Physiological Diagnosis of Movement Disorders. Role: Principal Investigator.

Parkinson's Study Group and NIH 5R01NS037167-08. 3/03-9/06. Parkinson's research: the organized genetic initiative (PROGENI). Tatiana Faroud (PI). Role: Local principal investigator.

Parkinson Study Group. 5/05-9/06. Follow-up of persons with neurological diseases (FOUND). Caroline Tanner (PI). Role: Local principal investigator.

Parkinson's study group, NIH, Cephalon and H. Lundbeck A/S. . 7/06-present. A longitudinal observational follow-up of the PRECEPT cohort (Post-CEPT). Ira Shoulson (PI). Role: Local principal investigator.

State of Arizona Disease Control Commission. Parkinson's Disease Program Project-Clinical Core. 7/01/03-10/31/05. Charles Adler (PI) Role: Clinical Core Investigator

Barrow Neurological Foundation. 7/01/02-6/30/04. Physiological Diagnosis of Parkinsonism. Role: Principal Investigator.

Merck KGaA. Feasibility study on the use of a Parkinson's disease symptoms diary for the planned phase III studies with sarizotan (EMR 62 225). 4/04-6/04. Role: Principal Investigator.

Parkinson Study Group. CALM-PD Cohort Study. The long term impact of initiating pramipexole versus

levodopa in early Parkinson's disease. 4/03-4/04. Role: Principal Investigator.

Intramural Program. National Institute of Neurological Disorders and Stroke. Real-time analysis of scalp electroencephalography during production of human voluntary movement. 2002. Role: Principal Investigator.

Intramural Program. National Institute of Neurological Disorders and Stroke. Principal Investigator. The Efficacy of High-Dose Intravenous Immunoglobulin Therapy in Patients with Cerebellar Degeneration: A Double-Blind, Placebo-Controlled Trial. 2002. Role: Principal Investigator.

Intramural Program. National Institute of Neurological Disorders and Stroke. Clinical Trial to Establish the Maximum Tolerated Dose of 1-octanol in Adults with Essential Tremor. 2001. Role: Principal Investigator. Sponsor for 1-octanol as an Investigational New Drug.

Intramural Program. National Institute of Neurological Disorders and Stroke. Open Label Controlled Trial of Gluten-free Diet in Patients with Gluten Sensitivity and Cerebellar Ataxia. 2000. Khalaf Bushara (PI) Role: Co-Investigator.

Intramural Program. National Institute of Neurological Disorders and Stroke. Double blind, Placebo-Controlled, Single Dose Trial of 1-Octanol in Essential Tremor. 2000. Khalaf Bushara (PI) Role: Co-Investigator.

Intramural Program. National Institute of Neurological Disorders and Stroke. Cortical physiological correlates of motor training in focal hand dystonia. National Institute of Neurological Disorders and Stroke. 2001 Kirsten Zeuner (PI). Role: Co-Investigator.

Intramural Program. National Institute of Neurological Disorders and Stroke. PET activation correlates of severity of focal hand dystonia. 2000. Alicija Mason (PI) Role: Co-investigator.

Roberts Pharmaceutical, Barrow Neurological Institute. Midodrine in the Treatment of Orthostatic Hypotension in Parkinson's Disease: a double blind, placebo-controlled study. 1999. Mark Stacy (PI). Role: Co-investigator

Cordis Endovascular Systems n-BCA/Tantalum Powder Clinical Study. Barrow Neurological Institute. 1999. Role: Independent Medical Examiner.

Prospective, Randomized Multicenter Clinical Trial to Evaluate the Occlusion of Presurgical Cerebral Arteriovenous Malformations with Neuracryl M Compared to Polyvinyl Alcohol (PVA) Particles. Barrow Neurological Institute. 1999. Role: Co-investigator.

Digital processing and analysis of EEG patterns during anesthesia. Honors Thesis. Departments of Electrical Engineering and Anesthesiology. Advisor: Dr. Kenneth Watt. University of Arizona, 1991.

Undergraduate Biology Research Program. Department of Immunology, University of Arizona. Differentiation and termination of human leukemic cells. Advisor: Dr. George Olson. 1990.

PROFFESIONAL ORGINIZATIONS

Parkinson Study Group Member

Certified by Board of American Psychiatry and Neurology- 2001.

Arizona Neurological Society, Member

American Academy of Neurology, Member

State of Arizona Medical License
Movement Disorder Society
Alpha Omega Alpha

SERVICE

Conference planner, Huntington's Disease Society of America annual convention, Phoenix, AZ 2009.
Examiner, American Board of Psychiatry and Neurology.
Assistance with the local Parkinson's disease support groups.
Assistance with local Restless Leg Syndrome support group
Assistance with International Essential Tremor Foundation support groups.
Presenter at Dystonia Medical Research Foundation Regional Patient Symposium, Mayo Clinic
Scottsdale, February 2004.
Medical Advisor, Huntington's Disease Society of America, Arizona Affiliate. Regular speaker at annual
Huntington's disease retreat.
Speaker at Mo Udall Symposium, an annual Parkinson patient event.
Ali Care Program, provides free medical care and case management to indigent Parkinson patients.
Community interviewer, University of Arizona College of Medicine, 2002-present.

PEER REVIEWED

PUBLICATIONS

Sabbagh MN, **Shill HA**. Latrepirdine, a potential novel treatment for Alzheimer's disease and
Huntington's chorea. *Curr Opin Investig Drugs*. 2010;11:80-91.

Beach TG, Adler CH, Sue LI, Lue L, Bachalakuri J, Henry-Watson J, Boyer S, Shirohi S, Brooks R, White
CL, Akiyama H, Caviness J, **Shill HA**, Sabbagh MN, Walker DG, and the Arizona Parkinson's Disease
Consortium "Multi-Organ Distribution of Phosphorylated Alpha-Synuclein Histopathology in Subjects
with Lewy Body Disorders" *Acta Neuropathol*, in press.

Choi S, Evidente VGH, Caviness JN, **Shill HA**, Sabbagh MN, Connor DJ, Hentz JG, Adler CH, Beach
TG. Are there differences in cerebral white matter lesion burdens between Parkinson's disease with or
without dementia? *Acta Neuropathol* 2010;119:147-9.

McKinnon J, Evidente VGH, Driver-Dunckley E, Premkumar A, Hentz JG, **Shill H**, Sabbagh MN,
Caviness JN, Connor DJ, Adler CH. Olfaction in the Elderly: A Cross-sectional Analysis Comparing
Parkinson Disease with Controls and Other Disorders. *Int J Neurosci* 2010;120:36-9.

Ravina B, Tanner C, Dieuliis D, Eberly S, Flagg E, Galpern WR, Fahn S, Goetz CG, Grate S, Kurlan R,
Lang AE, Marek K, Kieburtz K, Oakes D, Elliott R, Shoulson I; **Parkinson Study Group LABS-PD
Investigators**. A longitudinal program for biomarker development in Parkinson's disease: a feasibility
study. *Mov Disord*. 2009;24:2081-90

Marras C, Lang AE, Eberly SW, Oakes D, Fahn S, Schwid SR, Hyson C, Shoulson I; Parkinson Study
Group DATATOP and **PRECEPT investigators**. A comparison of treatment thresholds in two large
Parkinson's disease clinical trial cohorts. *Mov Disord*. 2009;24:2370-8

Latourelle JC, Pankratz N, Dumitriu A, Wilk JB, Goldwurm S, Pezzoli G, Mariani CB, Destefano AL,
Halter C, Gusella JF, Nichols WC, Myers RH, Foroud T, Coordinators PP, Laboratory PP, Coordinators
GI, **Laboratories GM**. Genomewide Association Study for Onset Age in Parkinson Disease. *BMC*

Medical Genetics 2009;10:98

Driver-Dunckley E, Connor D, Hentz J, Sabbagh M, Silverberg N, Hernandez J, Vedders L, Evidente VG, **Shill H**, Caviness J, Adler C. No evidence for cognitive dysfunction or depression in patients with mild restless leg syndrome. *Mov Disord* 2009; 24:1840-2.

Nichols WC, Pankratz N, Marek DK, Pauciulo MW, Elsaesser VE, Halter CA, Rudolph A, Wojcieszek J, Pfeiffer RF, Foroud T; Parkinson Study Group-**PROGENI Investigators**. Mutations in GBA are associated with familial Parkinson disease susceptibility and age at onset. *Neurology*. 2009;72(4):310-6.

Zhong Z, Nural H, He P, Civarella G, Beach T, Sue L, Adler C, **Shill H**, Caviness J, Xia W, Shen Y. Disassembled DJ-1 high molecular weight complex in cortex mitochondria from Parkinson's disease patients. *Mol Neurodegener*. 2009; 4:30.

Goldknopf IL, Bryson JK, Strelets I, Quintero S, Sheta EA, Mosqueda M, Park HR, Appel SH, **Shill H**, Sabbagh M, Chase B, Kaldjian E, Markopoulou K. Abnormal Serum Concentrations of Proteins in Parkinson's Disease. *Biochem Biophys Research Communications*, 2009;389:321-7

Shill HA. Emerging therapies in the treatment of essential tremor. *Clin Therapeutics* 2009; 1:613-620.

Broderick MP, Van Gemmert AWA, **Shill HA**, Stelmach GE. Hypometria and Bradykinesia during Drawing Movements in Individuals with Parkinson's Disease. *Experimental Brain Research*, 2009; 197, 223-233.

Beach TG, Walker DG, Lue LF, Sue LI, Sasse J, Bachalakuri J, Henry-Watson J, Boyer S, Shirohi S, Brooks R, Eschbacher J, White CL, Akiyama H, Caviness J, **Shill HA**, Connor DJ, Sabbagh MN, Adler CH and the Arizona Parkinson's Disease Consortium. Unified Staging System for Lewy Body Disorders: Correlation with Nigrostriatal Degeneration, Cognitive Impairment and Motor Dysfunction. *Acta Neuropathol*, 2009;117:613-34

Shill HA and Stacy M. Update on ropinirole in the treatment of Parkinson's disease. *Neuropsychiatric disease and treatment* 2009;5:33-6.

Pankratz N, Wilk JB, Latroulee JC, Destefano AL, Halter C, Pugh EW, Doheny KF, Gusella JF, Nicols WC, Foroud T, Myers RH. The PSG-PROGENI and **GenePD Investigators**, Coordinators and Molecular Genetic Laboratories. Genomewide association study for susceptibility genes contributing to familial Parkinson disease. *Hum Genet* 2008;124:593-605.

Latourelle JC, Sun M, PhD, Lew, MF, Suchowersky O, Klein C, Golbe LI, Mark MH, Growdon JH, Wooten GF, Watts R, Guttman M, Racette BA, Perlmutter JS, Ahmed A, **Shill HA**, Singer C, Goldwurm S et al. The Gly2019Ser mutation in LRRK2 is not fully penetrant in familial Parkinson's Disease: the GenePD study *BMC Medicine* 2008;6:32.

Beach TG, White CL, Hladik CL, Sabbagh MN, Connor DJ, **Shill HA**, Sue LI, Sasse J, Bachalakuri J, Henry-Watson J, Akiyama H, Adler CH. Olfactory bulb synucleinopathy has high specificity and sensitivity for Lewy body disorders. *Acta Neuropathol*, 2009;117:169-74

McNicoll CF, Latourelle JC, MacDonald ME, Lew MF, Suchowersky O, Klein C, Golbe LI, Mark MH, Growdon JH, Wooten GF, Watts RL, Guttman M, Racette BA, Perlmutter JS, Ahmed A, **Shill HA**, Singer C, Saint-Hilaire MH, Massood T, Huskey KW, DeStefano AL, Gillis T, Mysore J, Goldwurm S,

Pezzoli G, Baker KB, Itin I, Litvan I, Nicholson G, Corbett A, Nance M, Drasby E, Isaacson S, Burn DJ, Chinnery PF, Pramstaller PP, Al-Hinti J, Moller AT, Ostergaard K, Sherman SJ, Roxburgh R, Snow B, Slevin JT, Cambi F, Gusella JF, Myers RH. Huntington CAG repeat size does not modify onset age in familial Parkinson's disease: the GenePD study. *Mov Disord* 2008;23:1596-601.

Sabbagh MN, Adler CH, Lahti TJ, Connor DJ, Vedders L, Peterson LK, Caviness JN, **Shill HA**, Sue LI, Ziabreva I, Perry E, Ballard CG, Aarsland D, Walker DG, Beach TG. Parkinson's disease with dementia: comparing patients with and without Alzheimer pathology. *Alzheimer Dis Assoc Disord* 2009;23:295-7.

Sabbagh MN, Sandhu SS, Farlow MR, Vedders L, **Shill HA**, Caviness JN, Connor DJ, Sue L, Adler CH, Beach TG. Correlation of Clinical Features with Argyrophilic Grains at Autopsy. *Alzheimer Dis Assoc Disord* 2009; 23:229-33.

DeStefano AI, Latourelle JC, MacDonald ME, Lew, MF, Suchowersky O, Klein C, Golbe LI, Mark MH, Growdon JH, Wooten GF, Watts RL, Guttman M, Racette BA, Perlmutter JS, Marlor L, **Shill HA**, et al. Replication of association between ELAVL4 and Parkinson's disease: the GenePD study. *Hum Genet* 2008 124:95-99.

Stamper C, Siegel A, Liang WS, Pearson JV, Stephan DA, **Shill H**, Connor D, Caviness JN, Sabbagh M, Beach TG, Adler CH, Dunckley T. Neuronal gene expression correlates of Parkinson's disease with dementia. *Mov Disord*, 2008;23:1588-95

Tobin JE, Latourelle JC, Lew MF, Klein C, Suchowersky O, **Shill HA**, Lawrence Golbe LI, Mark MH, Growdon JH, Wooten FG, Racette BA, Perlmutter JS, Watts R, Guttman M, Baker KB, Goldwurm S, Pezzoli G, Singer C, Saint-Hilaire MH, Hendricks AE, Williamson S, Nagle MW, Wilk JB, Massood T, Laramie JM, DeStefano A, Litvan I, Nicholson G, Corbett AJ, Isaacson S, Burn DJ, Chinnery PF, Pramstaller PP, Sherman S, Al-hinti JA, Drasby E, Nance M, Moller AT, Ostergaard K, Roxburgh R, Snow B, Slevin JT, Cambi F, Gusella JF, and Myers RH. Haplotypes and gene expression implicate the MAPT region for Parkinson disease: The GenePD Study. *Neurology* 2008;71:28-34

Shill HA, Adler CH, Sabbagh MN, Connor DJ, Caviness JN , Beach TG. Pathological findings in prospectively ascertained essential tremor subjects. *Neurology* 2008;70:1452-5.

Parkinson Study Group PRECEPT Investigators Mixed lineage kinase inhibitor CEP-1347 fails to delay disability in early Parkinson disease. *Neurology* 2007;69:1480-90.

Schwarzschild MA, Schwid SR, Marek K, Watts A, Lang AE, Oakes D, Shoulson I, Ascherio A. and the **Parkinson Study Group PRECEPT Investigators**. Serum urate as a predictor of clinical and radiographic progression in Parkinson's disease, *Arch Neurol*, 2008;65:716-23.

Sabbagh MN, Lahti T, Connor DJ, Caviness JN, **Shill H**, Mahant P, Samanta J, Burns RS, Evidente VGH, Driver-Dunckley E, Reisberg B, Bircea S, Adler CH. Functional Ability Correlates with Cognitive Impairment in Parkinson's Disease and Alzheimer's Disease. *Dementia and Geriatric Cogn. Dis* 2007;24:327-34.

Alaedini A, Okamoto H, Briani C, Wollenberg K, **Shill HA**, Bushara KO, Sander HW, Green PH, Hallett M, Latov N. Immune cross-reactivity in celiac disease: anti-gliadin antibodies bind to neuronal synapsin I. *J Immunol*. 2007; 178:6590-5.

Caviness JN, Hentz JG, Evidente VGH, Driver-Dunckley ED, Samanta J, Mahant P, Connor DJ, Sabbagh MN, **Shill HA**, Adler CH. Both early and late cognitive dysfunction affects the electroencephalogram in Parkinson's disease. *Parkinsonism and Related Disorders* 2007;13:348-54.

Caviness JN, Driver-Dunckley ED, Connor DJ, Sabbagh MN, Noble B, Hentz JG, Evidente VGH, **Shill HA**, Adler CH. Defining mild cognitive impairment in Parkinson's disease. *Movement Disorders* 2007;22:1272-7.

Wilk JB, Tobin JE, Suchowersky O, **Shill H**, Klein C, Wooten GF, Lew M, Mark MH, Guttman M, Watts RL, Singer C, Growdon J, Latourelle JC, Saint-Hilaire M, DeStefano AL, Prakash R, Williamson S, Berg CJ, Sun M, Goldwurm S, Pezzoli G, Racette BA, Perlmutter JS, Parsian A, Baker K, Giroux ML, Litvan I, Pramstaller PP, Nicholson GA, Burn DJ, Chinnery PF, Vieregge P, Slevin JT, Cambi F, MacDonald ME, Gusella JF, Myers RH, Golbe LI. Herbicide exposure modifies GSTP1 haplotype association to Parkinson onset age: The GenePD Study. *Neurology* 2006;67:2206-10.

Pankratz N, Pauciulo MW, Elsaesser VE, Marek DK, Halter CA, Rudolph A, Shults CW, Foroud T, Nichols WC and the Parkinson Study Group – **PROGENI Investigators**. Mutations in LRRK2 other than G2019S are rare in a North American-based sample of familial Parkinson disease. *Mov Disord* 2006;21:2257-60.

Elble, R for the Tremor Research Group and **conference attendees**. Report from a US conference on essential tremor. *Mov Disord* 2006;21:2052-61.

NINDS Net-PD Investigators. A randomized, double blinded, futility clinical trial of creatine and minocycline in early Parkinson's disease. *Neurology*;2006,66:664-71.

Shill HA & Gerber P. Evaluation of clinical diagnostic criteria for psychogenic movement disorders. *Mov Disord* 2006;21:1163-8.

Shill HA, Shetter AG. Reliability in deep brain stimulation. *IEEE Trans Device Mater Rel* 2005;5:445-8.

Sun M, Latourelle JC, Wooten GF, Lew MF, Klein C, **Shill HA**, Golbe LI, Mark MH, Racette BA, Perlmutter JS, Parsian A, Guttman M, Nicholson G, Xu G, Wilk JB, Saint-Hilaire MH, DeStefano AL, Prakash R, Williamson S, Suchowersky O, Labelle N, Growdon JH, Singer C, Watts RL, Goldwurm S, Pezzoli G, Baker KB, Pramstaller PP, Burn DJ, Chinnery PF, Sherman S, Vieregge P, Litvan I, Gillis T, MacDonald ME, Myers RH, Gusella JF. Influence of heterozygosity for parkin mutation on onset age in familial Parkinson disease: the GenePD Study. *Arch Neurol*. 2006;63:826-32

Karamohamed S, Latourelle JC, Racette BA, Perlmutter JS, Wooten GF, Lew M, Klein C, **Shill H**, Golbe LI, et al. BDNF genetic variants are associated with onset-age of familial Parkinson's disease. *Neurology* 2005; 65:1823-5.

Caviness JN, **Shill, HA**, , Sabbagh MN, Evidente VGH, Hernandez JL Adler CH. Cortico-muscular coherence is increased in the small postural tremor of Parkinson's disease 2006;21:492-9.

Zeuner KE, **Shill HA**, Sohn YH, Molloy FM, Thornton BC, Dambrosia JM, Hallett M. Motor training as treatment in focal hand dystonia. *Mov Disord* 2005; 20:334-41.

Ladha SS, Walker R, **Shill HA**. A case of neuroleptic malignant-like syndrome precipitated by abrupt fava bean discontinuance. *Mov Disord*, 2005;20:630-1.

Lerner A, **Shill H**, Hanakawa T, Bushara K, Goldfine A, Hallett M. Regional cerebral blood flow correlates of the severity of writer's cramp symptoms. *NeuroImage* 2004;21:904-13.

Shill HA, Bushara KO, Mari Z, Reich M, Hallett M. Open-label dose escalation study of oral l-octanol in patients with essential tremor. *Neurology* 2004;62:2320-2.

Shill HA, Alaedini A, Latov N, Hallett M. Anti-ganglioside antibodies in sporadic and hereditary cerebellar degeneration. *Neurology*, 2003;60:1672-3.

Toma K, Matsuoka T, Immisch I, Mima T, Waldvogel D, Koshy B, Hanakawa T, **Shill H**, Hallett M. Generators of movement-related cortical potentials: fMRI-constrained EEG dipole analysis. *NeuroImage* 2002; 17:161-73.

Molloy FM, **Shill HA**, Kaelin-Lang A, Karp BI. Accuracy of muscle localization without EMG: Implications for treatment of limb dystonia. *Neurology* 2002; 58: 805-7.

Shill H, Stacy M. Respiratory complications of Parkinson's disease. *Semin Respir Crit Care Med.* 2002;23:261-5.

Shill HA, Hallett M. Cerebellar diseases. *Int Rev Psychiatry* 2001;13:261-7.

Bushara KO, Goebel SU, **Shill H**, Goldfarb LG, Hallett M. Gluten sensitivity in sporadic and hereditary cerebellar ataxia. *Ann Neurol* 2001;49:540-3.

Verhagen-Metman L, Gillespie M, Farmer C, Bibbiani F, Spiridon K, Morris M, **Shill H**, Bara-Jimenez W, Mouradian M, Chase T. Levodopa sparing effect of a transdermal D2-dopamine agonist. *Clin Neuropharmacol* 2001;24:163-9.

Shill HA, Fife TD. Valproic acid toxicity mimicking multiple system atrophy. *Neurology* 2000;55:1936-7.

Shill HA, Stacy MA, Malignant catatonia secondary to sporadic encephalitis lethargica. *J Neurol, Neurosurg Psychiatry* 2000;69:402-3.

Shill HA, Stacy MA, Respiratory function in Parkinson's disease. *Clin Neurosci* 2000;5:131-5.

Forbes KP, **Shill HA**, Britt PM, Zabramski JM, Spetzler RF, Heiserman JE. Assessment of silent embolism from carotid endarterectomy by use of diffusion-weighted imaging: work in progress. *Am J Neuroradiol* 2001;22:650-3.

Britt PM, Heiserman JE, Snider RM, **Shill HA**, Bird CR, Wallace RC. Incidence of postangiographic abnormalities revealed by diffusion-weighted MR imaging. *Am J Neuroradiol* 2000;21:55-9.

Abstracts

Kurlan R, Ravina B, Eberly S, Oakes D and Shoulson I for the **PSG PostCEPT (LABS-PD) Investigators**. Early clinical predictors of treatment-resistant outcomes in Parkinson's disease. Presented at the Symposium on Etiology, Pathogenesis, and Treatment of Parkinson's Disease and Other Movement Disorders of Saturday, May 15, 2010.

Marek K, Ravina B, Seibyl J, Jennings D, Eberly S, Oakes D and Shoulson I for the **PSG**

PostCEPT (LABS-PD) Investigators. Dopamine Transporter (DAT) Imaging Predicts Motor and Treatment-Resistant Outcomes in Parkinson Disease. Presented at the Symposium on Etiology, Pathogenesis, and Treatment of Parkinson's Disease and Other Movement Disorders of Saturday, May 15, 2010.

Damian AM, Jacobson SA, Belden C, **Shill H**, Sabbagh M, Vedders L, Adler CH. Analysis of the Montreal Cognitive Assessment (MoCA) and its Seven Domains versus the Mini-Mental State Examination in Cognitively Impaired versus Cognitively Normal Patients as Assessed by Neuropsychological Testing Presented at the American Academy of Neurology, April 13, 2010.

Adler CH, Hentz JG, **Shill HA**, Sabbagh MN, Connor DJ, Evidente VG, Driver-Dunckley E, Tanner C, Kukull W, Vedders L, Jacobson S, Caviness JN, Beach TG. Parkinson's Disease Increases Risk for Mild Cognitive Impairment. Presented at the American Academy of Neurology, April 13, 2010.

Adler CH, Caviness, JNC, **Shill HA**, Sabbagh MN, Connor DJ, Walker D, Lue, LF, Sue L, Vedders L, ¹Hentz JG, Beach TG. New Unified Staging System for Lewy Body Disorders. Presented at the 13th International Congress of Parkinson's Disease and Movement Disorders, Paris, FR, June 2009.

Caviness JNC et al. Parkinson's dementia, mechanisms of cortical neuron dysfunction. Presented at the 13th International Congress of Parkinson's Disease and Movement Disorders, Paris, FR, June 2009.

Adler CH, Connor D, Caviness J, Sabbagh MN, **Shill HA**, Vedders L, Sue L, Beach T. Neuropathologic Findings in Patients with Parkinson's Disease and Mild Cognitive Impairment. *Neurology* 2009; 72 (Suppl 3): A437.

Shill HA, Adler CH, Beach TG, Lue L, Sue LI, Campbell NA and Walker DG. Striatal tyrosine hydroxylase in autopsied patients with essential tremor. *Neurology* 2009; (Suppl 3):A100.

Aleksandra Obradov A, Beach TG, Adler CH, PhD, **Shill HA**, Vedders L, Sue LI, Caviness JNC, Sabbagh MN. Hippocampal Sclerosis Co-Existing with Parkinson's Disease Dementia. *Neurology* 2009; Suppl 3): A383.

Van Gemmert AWA, Rigenbach SDR, **Shill HA**, Stelmach G. Complex bimanual coordination is performed accurately using verbal instructions in Parkinson's disease patients. Presented at the 14th Conference of the International Graphonomics Society, September, 13 2009.

Adler CH, Caviness JN, **Shill HA**, Sabbagh MN, Connor DJ, Walker D, Lue L, Sue L, Vedders L, Hentz JG, Beach TG and the Arizona PD Consortium. New Unified Staging System for Lewy Body Disorders. Presented at The Movement Disorder Society's 13th International Congress of Parkinson's Disease and Movement Disorders, Paris, Fr, June 2009.

Choi S, Evidente VGH, Caviness JN, **Shill HA**, Sabbagh MN, Connor DJ, Hentz JG, Adler CH, Beach TG. Are There Differences in Cerebral White Matter Lesion Burdens Between Parkinson's Disease Patients With or Without Dementia? Presented at the American Academy of Neurology, April 2009.

Weintraub D, Koester J, Potenza MN, Siderowf AD, Stacy MA, Whetteckey J, Wunderlich GR, Lang AE for the **DOMNION Study Group**. Dopaminergic therapy and impulse control disorders in Parkinson's disease: top line results of a cross-sectional study of over 3,000 patients. Presented at the 12th International Congress of Parkinson's Disease and Movement Disorders, Chicago, IL, June 25, 2008

Moguel-Cobos G, Williams C, Goslar P, **Shill H**. The relationship between social phobia and Parkinson's disease. *Mov Disord* 2008;23(Suppl 1):S277-8.

Adler CH, Connor DJ, Sabbagh MN, **Shill HA**, Hentz JG, Evidente VGH, Mahant P, Samanta J, Burns RS, Ahmed A, Driver-Dunckley E, Vedders L, Noble B, Caviness JN. Parkinson's disease increases the risk for developing mild cognitive impairment. *Mov Disord* 2008;23(Suppl 1):S100.

Adler C, Connor D, Sabbagh M, Beach T, **Shill H**, Vedders L, Sue L, Caviness J. Neuropathologic findings in patients with Parkinson's disease and mild cognitive impairment. *J Neurol* 255(Suppl 2):31-32, 2008

Sabbagh MN, Sandhu S, Farlow M, Beach T, Vedders L, **Shill H**, Caviness J, Connor D, Sue L Adler C. Correlation of clinical features to argyrophillic grains at autopsy. Presented at the American Academy of Neurology, Chicago, IL, April 15, 2008.

Sabbagh MN, Benson B, Adler CH, Hentz J, Sue L, **Shill H**, Caviness J, Walker D, Vedders L, Lahti L, Beach TC. Parkinson's Disease and Apolipoprotein. Presented at the American Academy of Neurology, Chicago, IL, April 17, 2008.

Adler CH, Connor DJ, Sabbagh MN, Caviness JN, **Shill HA**, Hentz JG, Beach TN. Non-Specific Motor and Cognitive Changes in Incidental Lewy Body Disease. Presented at the American Academy of Neurology, Chicago, IL, April 16, 2008.

Shill HA, Adler CH, Sabbagh MN, Connor DJ, Caviness JN, Beach TG. Pathological changes in prospectively ascertained essential tremor subjects. Presented at the American Academy of Neurology, Boston, MA, May 2, 2007.

Parkinson Study Group **PRECEPT Investigators** (Chris Hyson, presenter), "Baseline Comparison of the PRECEPT and DATATOP Clinical Trial Cohorts," World Parkinson Congress in Washington, DC, February 23, 2006.

Coles MA, O'Donnell DA, **Shill HA**. The influence of the "art of moving" exercise program on quality of life for people with PD. Presented at the World Parkinson Congress, Washington, DC, USA. February 22-26, 2006

Oswald SL. **Shill HA**. Description of participant population in Parkinson's Disease Registry" Presented at the World Parkinson Congress, Washington, DC, USA. February 22-26, 2006.

Parkinson Study Group **PRECEPT Investigators** (Shoulson I, presenter), "CEP-1347 Fails to Favorably Modify the Progression of Early Parkinson's Disease (PRECEPT Study)", 'Late Breaking Science' platform presentation, American Academy of Neurology, San Diego, California, April 5, 2006.

Arizona Parkinson's Disease Center (Adler, CH, presenter). Predicting clinically probable PD. Presented at the American Academy of Neurology, San Diego, CA. April 4, 2006.

Ringenbach S, Van Gemmert A, **Shill H**, Stelmach G. Cue benefits on drawing task in parkinsonian patients depend on task requirements. Presented at the Society for Neuroscience Annual Meeting, November 15, 2005.

Moguel-Comos G, **Shill HA**. Social phobia and Parkinson's disease. Presented at Academic Excellence Day, Mayo Clinic, Scottsdale, AZ, May 4, 2005.

Driver-Dunckley E, Caviness JN, Charles H. Adler CH, Sabbagh M, Don Connor D, Jose Hernandez J,

Virgilio Gerald H, Evidente VGH, **Shill H**. Mild cognitive impairment in Parkinson's disease. Presented at the American Academy of Neurology meeting, Miami, FL, April, 2005.

Oswald S, **Shill HA**, Coles MA. Does the type of physician seen impact the medications prescribed? Presented at The Movement Disorder Society's 9th International Congress of Parkinson's Disease and Movement Disorders. New Orleans, March, 2005.

Driver-Dunckley E, Adler CH, Caviness JN, Sabbagh M, Connor D, Silverberg N, Hentz JG, Hernandez J, Evidente VGH, **Shill H**. No evidence for cognitive dysfunction or depression in patients with RLS: A case-controlled study. Presented at The Movement Disorder Society's 9th International Congress of Parkinson's Disease and Movement Disorders. New Orleans, LA, March 2005.

Adler CH, Caviness JN, Sabbagh M, Hentz JG, Evidente VGH, **Shill H**, et al. Olfactory Testing in Parkinson's Disease, Normal Aging, and Other Movement Disorders: Correlation with Parkinsonian Severity. Presented at The Movement Disorder Society's 9th International Congress of Parkinson's Disease and Movement Disorders. New Orleans, LA, March 2005.

Adler, CA, Caviness JN, MD, Sabbagh M, Connor D, Hentz JG, **Shill H**, Evidente VGH, Stacy M, Joyce JN, Beach T. Motor Impairment in Normal Aging, Possible PD, and Definite PD: Longitudinal Evaluation of a Cohort of Prospective Brain Donors. Presented at the Eighteenth Annual Symposium on Etiology, Pathogenesis and Treatment of Parkinson's Disease and Other Movement Disorders. Toronto, Ontario, CA. October, 2004.

Gerber P, **Shill H**. Appraisal of diagnostic criteria for psychogenic movement disorders. Presented at the Psychogenic Movement Disorder Workshop. Atlanta, GA. October, 2003.

Shill HA, Reich M, Bushara KO, Grimes G, Hallett M. Dose- escalation study of oral 1-octanol in patients with essential tremor. *Mov Disord* 2002;17 (Suppl 5):S346.

Bushara KO, **Shill HS**, Hallett M. Octanol for essential tremor. A double-blind, placebo-controlled trial. *Mov Disord* 2002;17(Suppl 5):S350.

Bushara KO, **Shill HS**, Hallett M. Open-label trial of gluten-free diet in sporadic and hereditary cerebellar ataxia. *Mov Disord* 2002;17 (Suppl 5):S314.

Shill HA, Luo ML, Hallett M. Cortical activity during motor sequencing in dystonia. Presented at the American Academy of Neurology meeting, 2001.

Toma K, Immisch I, Koshy B, Mima T, Waldvogel D, Hanakawa T, Matsuoka T, **Shill H**, Hallett M. fMRI-constrained source analysis of movement-related cortical potentials. Presented at the International Congress of Clinical Neurophysiology meeting, 2001.

BOOK CHAPTERS

Shill HA & Hallett MA. Physiology of primary dystonia In: Stacy M, ed. Handbook of dystonia. Informa Healthcare. New York, NY, 2007; 5:57-63.

Shill H. Respiratory Dysfunction in Parkinson's disease. In: Pfeiffer RF and Bodis-Wollner I, eds. Current Clinical Neurology: Parkinson's disease and non-motor dysfunction. Totowa, NJ: Humana Press Inc., 2005; 14:173-8.

Shill H. Respiratory dysfunction. In: Pfeiffer R and Ebadi M, eds. Parkinson's disease. Boca Raton, FL: CRC Press, LLC., 2005; 30:323-8.

Invited publications

Shill HA. Emerging pathogenesis of essential tremor. AAN.com. Retrieved 10/27/2008 from http://www.aan.com/news/?event=read&article_id=6624&page=72.45.45