

## **CURRICULUM VITAE**

### **Philip Hitchins Schwartz, PhD**

**BUSINESS ADDRESS:** CHOC Human Neural Stem Cell Resource  
Center for Neuroscience Research  
Center for Translational Research  
Children's Hospital of Orange County (CHOC)  
Research Institute  
455 South Main Street  
Orange, California 92868-3874  
E-Mail: [pschwartz@choc.org](mailto:pschwartz@choc.org)  
Web Site: [www.nhnsr.org](http://www.nhnsr.org)

### **EDUCATION:**

*Graduate:* *Ph.D., Neuroscience (with minor in Pharmacology), 1992*  
Brain Research Institute  
School of Medicine  
University of California, Los Angeles

**Dissertation:** *"An Adult and a Neonatal Model of Cerebral Ischemia: Participation of Excitotoxic Mechanisms"*

*Thesis Committee:*

Claude G. Wasterlain, M.D., Neurology, *Chair*  
Richard Olsen, PhD, Pharmacology  
Anthony Verity, MD, Neuropathology  
Arnold Scheibel, MD, Psychiatry and Anatomy  
Anne Morin, PhD, Neuroscience

*Undergraduate:* *B.S., Biology (with minor in Physics), 1978*  
*B.S., Chemistry, ACS Certified, 1978*  
Departments of Chemistry, Biology, and Physics  
School of Science and Engineering  
Seattle University, Seattle, Washington

**Thesis:** *"Isolation and Identification of in vitro and in vivo Metabolites of UL-<sup>14</sup>C-2,2'-Dichlorobiphenyl from Coho Salmon (Oncorhynchus kisutch)"*

## RESEARCH EXPERIENCE:

*Current Positions:*      Director/Senior Scientist II (highest position), 10/07 - present  
CHOC Human Neural Stem Cell Resource  
Center for Neuroscience Research  
Center for Translational Research  
Children's Hospital of Orange County Research Institute  
Orange, California

Principal Investigator, 5/03 - present  
NIH Human Embryonic Stem Cell Culture Training Course  
CHOC Human Neural Stem Cell Resource  
Center for Neuroscience Research  
Children's Hospital of Orange County Research Institute  
Orange, California

Associate Research Biologist (WOS), 7/04 – present  
Developmental Biology Center  
School of Biological Sciences  
University of California, Irvine

Adjunct Research Faculty, 8/08 – present  
Department of Biological Sciences  
College of Natural Sciences and Mathematics  
California State University, Fullerton

Visiting Associate Professor, 7/04 - present  
Stem Cells and Regeneration Program  
The Burnham Institute  
La Jolla, California

Visiting Associate Professor, 7/07 - present  
Center for Regenerative Medicine  
The Scripps Research Institute  
La Jolla, California

### *Positions held:*

Director and Senior Scientist I, 4/01 – 09/07  
CHOC Human Neural Stem Cell Resource  
Center for Neuroscience Research  
Center for Translational Research  
Children's Hospital of Orange County Research Institute  
Orange, California

Visiting Assistant Professor, 1/04 - 6/04  
Stem Cells and Regeneration Program  
The Burnham Institute

La Jolla, California

Assistant Research Biologist, 7/02 – 6/04  
Developmental Biology Center  
School of Biological Sciences  
University of California, Irvine

Director, 8/01 – 3/02  
NICHD Brain and Tissue Bank for Developmental Disorders  
Children's Hospital of Orange County Research Institute  
Orange, California

Coordinator and Project Pathologist, 11/96 – 7/01  
NICHD Brain and Tissue Bank for Developmental Disorders  
Children's Hospital of Orange County Research Institute  
Orange, California

Assistant Adjunct Professor, 4/92 - 6/93  
Department of Neurology  
University of California, Irvine

Staff Research Associate, 1/92 - 3/92  
Department of Neurology  
University of California, Irvine

Research Associate, 4/84 - 12/91  
Epilepsy Research Laboratories  
Veterans Administration Medical Center  
Sepulveda, California

Research Specialist IV, 9/81 - 1/91  
Pediatric ICU Research  
Childrens Hospital, Los Angeles  
Los Angeles, California

Research Assistant, 1/79 - 9/81  
Departments of Neuroscience and Psychology  
University of California, Los Angeles

Physical Science Aid, 5/75 - 6/78  
National Marine Fisheries Service  
National Oceanic and Atmospheric Administration  
Seattle, Washington

*Summary of Activities:*  
Derivation of induced pluripotent stem cells  
Animal models of neurodegenerative disease

Stem cell transplantation  
Microfluidic analysis of stem cells  
Culture of human embryonic stem cells  
Gene expression analysis  
Derivation and culture of postnatal human neural stem cells and glia  
Derivation and culture of human bone marrow and cord blood mesenchymal stem cells  
Derivation and culture of human fetal neurons and glia  
Derivation and culture of human fibroblasts and myoblasts  
Immunocyto- and Immunohistochemistry  
Electrophysiology of cultured cells  
Case reports - human neurogenetic disease  
Neurogenetic diagnostics  
Human brain dissection  
Human autopsy  
Human brain and tissue banking  
Cryopreservation  
Pharmacokinetic analyses of therapeutic drugs in humans  
Pharmacokinetic analyses of experimental drugs in animals  
Statistical outcome analysis (cancer and cardiac arrest in humans)  
Statistical analysis using computer-based software (SAS, SPSS)  
Animal models of neonatal hypoxic-ischemic brain injury  
Animal models of cardiac arrest induced brain injury  
Animal models of mitochondrial dysfunction-induced brain injury  
Animal models of status epilepticus  
Drug, xenobiotic, and nutrient metabolism in animals  
*In vivo* neurotransmitter receptor binding  
Pharmacotherapy of neurologic disease  
Pharmacologic neuroprotection  
*In vivo* physiologic monitoring  
Neuropathologic analysis  
Animal behavior monitoring  
Analytical chemistry

**RESEARCH GRANT SUPPORT:**

*Active (\$6,408,638 total costs):*

TB1-01182 (Klig); 7/1/09 – 6/30/12; CIRM; \$1,337,700

CIRM Stem Cell Research Biotechnology Training Program at CSULB

R01-HD059967 (Schwartz); 7/1/09 – 6/30/14; NIH, \$2,980,161

An Open Resource for Autism iPSCs and their Derivatives

CG-99000 (Schwartz); 1/1/09 – 12/31/09; CIRM, \$11,813

## Stem Cell Therapies for Pediatric Diseases and Injuries: A Critical Evaluation

T15 HL074286 S1 (Schwartz); 6/1/08 - 7/2/10; NHLBI, \$81,000  
Human iPSC Derivation and Culture Training

T15 HL074286 (Schwartz); 6/1/08 - 7/2/10; NHLBI, \$147,000  
Human Stem Cell Transplantation Training

No Number (Schwartz); 7/1/01 - 6/30/10; CHOC Foundation, \$656,000  
National Human Neural Stem Cell Resource

No Number (Schwartz); 1/1/06 - 6/30/10; CHOC Foundation, \$109,100  
Stem Cell Therapy for Lysosomal Storage Disorders

T15 HL074286 (Schwartz); 5/1/03 - 7/2/10; NHLBI, \$1,034,024  
Human Embryonic Stem Cell Culture Training Course

T15 HL085028 (Loring); 5/1/06 - 4/30/10; NHLBI, \$51,840  
Human Embryonic Stem Cells: Comprehensive Training Program

### *Pending:*

R01 NS063236 (Schwartz); 4/1/2010 – 3/31/2015, NIH, \$3,780,175  
Stem Cell Transplantation for the Lysosomal Storage Disorders

### *Completed:*

Contract (Schwartz); 10/1/06 – 6/30/09; Autism Speaks, \$46,195  
hNPCs from Post-Mortem Autism and Control Brains

RO1 AG024488 (Hagerman); 6/1/05 – 5/31/08; NIA, \$590,318  
Fragile X-Associated Tremor Ataxia Syndrome

2005 IIRGA (Loring); 09/01/05 – 08/31/07; Alzheimer's Association, \$30,000  
Stem Cells as Delivery Vehicles to Target Amyloid Plaques and Tangles

R01 CA091043 (Bryant); 12/01/02 - 11/30/05; NCI; \$150,000  
Neuronal Transplants as an Organotypic Brain Tumor Model (Consultant)

No Number (Schwartz); 7/1/02 - 6/30/05; CHOC Foundation, \$247,500  
Transplantation of Human Neural Stem Cells

02-3 (Schwartz); 7/1/02 - 6/30/04; United Mitochondrial Dis. Found., \$81,574  
Electrophysiology of Neural Stem Cells with Mitochondrial Disease

N01-HD-8-3284 (Petito); 8/1/01 - 3/31/02; NICHD, \$38,407  
Brain and Tissue Bank for Developmental Disorders (Subcontract)

No Number (Schwartz); 4/1/01 - 9/30/01; Salk Institute, \$21,232  
National Human Neural Stem Cell Resource

N01-HD-8-3284 (Petito); 9/29/96 - 7/31/01; NICHD, \$576,094  
Brain and Tissue Bank for Developmental Disorders (Subcontract)

No Number (Wasterlain); 1/1/90 – 3/31/91; Wallace Laboratories, \$160,000  
The Effect of Felbamate on Neuronal Injury after in vivo and in vitro Hypoxia/Ischemia

No Number (Wasterlain); 1/1/88 – 12/31/88; Merck Sharp & Dohme, \$74,505  
The Effect of MK-801 on Selective Neuronal Necrosis after Cardiac Arrest in the Rat

### **ACTIVE COLLABORATIONS:**

#### *Current Clinical Collaborators:*

1. Jose Abdenur, MD, Chief, Division of Metabolic Genetics, Children's Hospital of Orange County, Orange, CA
2. Nick Anas, MD, Chief, Division of Pediatric Intensive Care, Children's Hospital of Orange County, Orange, CA
3. Bruce Barshop, MD, PhD, Co-Director, Biochemical Genetics Laboratory, Department of Pediatrics; Assistant Director, Pediatric Pharmacology Research Unit; Associate Clinical Professor, Department of Pediatrics, University of California, San Diego, CA
4. John Cleary, MD, Division of Pulmonology and Neonatology, Children's Hospital of Orange County, Orange, CA
5. Gregory Evans, MD, Professor & Chief/Division of Plastic Surgery -- Professor of Surgery, Center for Biomedical Engineering, University of California, Irvine
6. Sidney Gospe, MD, Sarkowsky Professor and Division Head, Pediatric Neurology, Departments of Neurology and Pediatrics, School of Medicine, University of Washington, Seattle, WA
7. Claudia Greco, MD, Associate Physician, Department of Pathology (Neuropathology), School of Medicine, University of California, Davis, CA
8. Rick Harrison, MD, Associate Professor of Pediatrics and Co-Director, Pediatric Intensive Care Unit, Children's Hospital, School of Medicine, University of California, Los Angeles, CA
9. Edwin Monuki, MD, PhD, Assistant Professor of Neuropathology, University of California, Irvine
10. Robert Naviaux, MD, PhD, Assistant Professor In Residence, Pediatrics, Biochemical Genetics and Metabolism; Co-director, The Mitochondrial and Metabolic Disease Center (MMDC); Co-director, The Molecular Diagnostic Laboratory, MMDC, School of Medicine, University of California, San Diego, CA
11. James Powers, MD, Professor, Pathology and Neurology, University of Rochester, Rochester, New York
12. Steven Romansky, MD, Clinical Professor of Pathology, College of Medicine, University of California, Irvine; Pathologist, Long Beach Memorial Medical Center

13. Robert Steiner, MD, Associate Professor of Pediatrics & Molecular and Medical Genetics, Head: Division of Metabolism, Oregon Health & Sciences University, Portland, OR

*Current Research Collaborators:*

1. Hava Avraham, PhD, Associate Professor of Medicine, Beth Israel Deaconess Medical Center, Harvard University, Boston, MA *“Molecular biology of brain specific nuclear restricted protein”*
2. Steven Back, MD, PhD, Assistant Professor, Department of Pediatrics (Neurology), Oregon Health and Sciences University, Portland, OR *“Transplantation of ovine stem cells in a sheep model of periventricular leukomalacia”*
3. Michael Bell, MD, Pediatric Intensivist, Center for Neuroscience Research, Children’s National Medical Center, Washington, DC *“Transplantation of human neural stem cells in animal models of stroke”*
4. Peter Bryant, PhD, Professor and Director of the Molecular Biology, Genetics and Biochemistry Training Program, School of Biological Sciences, University of California, Irvine, CA *“Asymmetric cell division in human neural stem cells”*
5. K.V. Chalam, MD, PhD, Assistant Professor, Department of Ophthalmology, University of Florida, Jacksonville, Florida *Differentiation of human neural stem cells into photoreceptors”*
6. Jerold Chun, MD, PhD, Professor, Department of Molecular Biology, The Helen L. Dorris Child & Adolescent Neuropsychiatric Disorder Institute, The Scripps Research Institute, La Jolla, CA *“Aneuploidies in the Developing Nervous System”*
7. Stephen J. Crocker, Ph.D., Department of Neuropharmacology, The Scripps Research Institute, La Jolla, CA *“Temporin Expression as a Regulator of Oligodendrocyte Differentiation”*
8. Steven Dewhurst, PhD, Professor, Department of Microbiology and Immunology, University of Rochester Medical Center, Rochester, New York *HIV infection of human neural stem cells”*
9. Lisa Flanagan, PhD, Assistant Research Biologist, Department of Pathology, College of Medicine, University of California, Irvine, Irvine, CA *“Participation of the extracellular matrix in the proliferation, migration, and differentiation of human neural stem cells”*
10. Lee Fortunato, PhD, Assistant Professor, University of Idaho, Department of Microbiology, Molecular Biology and Biochemistry, Moscow, ID *“Interaction of Human Cytomegalovirus with Cells in the Developing Fetal Brain”*
11. Paul Hagerman, MD, PhD, Professor, Department of Biological Chemistry, School of Medicine, University of California, Davis *“Molecular mechanisms of FMRP dysregulation in Fragile X and FXTAS”*
12. Carolyn Horrocks, PhD, Director of Cell Development, NeuroNova AB, Stockholm, Sweden *Generation of clinically useful neural stem cells from human brain biopsy tissue”*
13. Samie Jaffrey, MD, PhD, Assistant Professor, Department of Pharmacology, Cornell University, New York, New York *Alterations of mRNA transcription in Fragile X”*

14. Noo Li Jeon, PhD, Assistant Professor, Department of Chemical Engineering and Materials Sciences, The Henry Samueli School of Engineering, University of California, Irvine, CA *"Human neural stem cell growth and differentiation in a gradient-generating microfluidic device"*
15. Michael Joiner, PhD, Professor, Department of Radiation Oncology, Wayne State University, Detroit, MI *"The radiation response of human neural stem cells"*
16. Henry J. Klassen, MD, PhD, Assistant Professor of Ophthalmology in Residence, University of California, Irvine, School of Medicine *"Transplantation of retinal and neural stem cells in retinal disease and injury"*
17. Abraham Lee, PhD, Professor, Department of Biomedical Engineering, The Henry Samueli School of Engineering, University of California, Irvine, CA *"Characterization of neural cells for cell sorting using flow induced electrical admittance spectra in microfluidics"*
18. Jeanne Loring, PhD, Adjunct Associate Professor, Stem Cells and Regeneration Program, The Burnham Institute, La Jolla, CA *"Gene expression analysis in human stem cells"*
19. Anne Moser of the Neurogenetics Research Center, Kennedy Krieger Institute, Baltimore, MD *"Analysis of VLCFAs in neural stem cells cultures taken from brains of patients with peroxisomal disorders"*
20. Franz-Josef Muller, MD, PhD, Germany *"Pro- and anti-migratory chemokines in the development of the nervous system"*
21. Karin Narfström, PhD, Department of Veterinary Medicine and Surgery, University of Missouri-Columbia, MO *"Feline neural stem cells in a cat model of retinal degeneration"*
22. Diane K. O'Dowd, PhD, Professor, Departments of Anatomy and Neurobiology and Developmental and Cell Biology, College of Medicine and School of Biological Sciences, University of California, Irvine, CA *"Electrophysiology in human neural stem cells"*
23. Malla Padidam, PhD, Director, Functional Genomics, RheoGene, Inc., Norristown, PA *"Adenovirus transduction of human neural stem cells"*
24. Theo Palmer, PhD, Assistant Professor, Department of Neurosurgery, Stanford University School of Medicine, Stanford, CA *"Participation of the NOTCH pathway in the differentiation of human neural stem cells"*
25. David M. Panchision, PhD, Investigator, Center for Neuroscience Research, Children's Research Institute, Children's National Medical Center, Washington, DC *"The effect of hypoxia on neural stem cell proliferation and differentiation"*
26. Roger Prather, PhD, Professor, Department of Veterinary Medicine, University of Missouri, MO *"Porcine neural stem cells from the transgenic pig"*
27. Stevens K. Rehen, PhD, Associate Professor, Federal University of Rio de Janeiro, Brazil *"Aneuploidies in human embryonic and neural stem cells"*
28. Stuart Schreiber, PhD, Chair, Department of Chemistry and Chemical Biology, The Broad Institute, Harvard University, Boston, MA *"High-throughput small molecule screening with human neural stem cells"*
29. Lamy Shihabuddin, PhD, Section Leader, Neural Regeneration, Genzyme Pharmaceuticals, Framingham, MA *"Transplantation of human neural stem cells in animal models of mucopolysaccharidosis"*

30. Evan Snyder, MD, PhD, Director, Stem Cells and Regeneration Program, The Burnham Institute, La Jolla, CA *"Transplantation of human neural stem cells in animal models of gangliosidosis"*
31. Flora Tassone, PhD, Assistant Research Biochemist, Department of Biological Chemistry, School of Medicine, University of California, Davis, CA *"Molecular biology of FMRP dysregulation in Fragile X syndrome and FXTAS"*
32. Alexey Terskikh, PhD, Assistant Professor, Stem Cells and Regeneration Program, The Burnham Institute, La Jolla, CA *"In vitro and in vivo comparisons of human neural stem cells and neuralized human embryonic stem cells"*
33. Douglas C. Wallace, PhD, Director, Center for Molecular and Mitochondrial Medicine and Genetics, University of California, Irvine *"Application of cybrid technology to genomic replacement in human neural and embryonic stem cells"*
34. Paul Watkins, MD, PhD, Director, Lipid Enzymology Laboratory, Kennedy Krieger Institute, Baltimore, MD *"VLCFA metabolism in neural stem cells harvested from brains of patients with peroxisomal disorders"*
35. Michael Young, PhD, Assistant Professor, department of Ophthalmology, Harvard medical School, Boston, MA *"Retinal and neural stem cells in the treatment of large animal models of retinal disease and injury"*
36. W. Michael Zawada, PhD, Associate Professor, Clinical Pharmacology and Toxicology, University of Colorado Health Sciences Center, Denver, CO *"Effect of reactive oxygen species on the immunology of human neural stem cells"*

#### **OTHER EXPERIENCE:**

Invited Attendee, May 2009  
Autism Workshop  
California Institute for Regenerative Medicine  
San Francisco, California

Invited Attendee, April 2009  
Clinical Trials Workshop  
California Institute for Regenerative Medicine  
San Francisco, California

Faculty, Developmental Biology 247, Spring 2009  
Stem Cell Ethics  
School of Biological Sciences  
University of California, Irvine, CA

Organizer, Moderator, and Chair, March 2009  
3<sup>rd</sup> Annual Symposium  
*Stem Cell Therapies for Pediatric Diseases and Injuries:  
A Critical Evaluation*  
CHOC Research Institute  
Orange, California

Director, hESC Culture Training Course, March 2009

Children's Hospital of Orange County  
Orange, California

Co-Director, hESC Culture Training Course, Sept 2008  
Scripps Research Institute  
La Jolla, California

Founder and Chief Executive Officer, 2008  
Sperogen  
Irvine, CA

Faculty, Molecular, Cellular, and Developmental Biology  
246, Spring 2008  
Stem Cell Biology  
College of Letters and Science  
University of California, Santa Barbara, CA

Founder, Board Member, and Chief Scientific Officer,  
2006 – 2008  
Michigan Institute for Stem Cell Research  
Lansing, Michigan

Member, Advisory Board, June 2008 - present  
Oxford Stem Cell Institute  
Dr. Paul Fairchild, Director  
Oxford University  
Oxford, UK

Organizer, Moderator, and Chair, March 2008  
2<sup>nd</sup> Annual Symposium  
*Stem Cell Therapies for Pediatric Diseases and Injuries:  
A Critical Evaluation*  
CHOC Research Institute  
Orange, California

Director, hESC Culture Training Course, March 2008  
Children's Hospital of Orange County  
Orange, California

Member, Advisory Board, January 2008  
Stem Cell Biology and Regenerative Medicine Center  
Dr. Michael Lisanti, Director  
Thomas Jefferson University  
Philadelphia, PA

Faculty, Developmental Biology 245, Fall 2007  
Stem Cell Biology

School of Biological Sciences  
University of California, Irvine, CA

Co-Director, hESC Culture Training Course, July 2007  
Burnham Institute for Medical Research  
La Jolla, California

Organizer, Moderator, and Chair, March 2007  
*Stem Cell Therapies for Pediatric Diseases and Injuries:  
A Critical Evaluation*  
CHOC Research Institute  
Irvine, California

Exhibitor, December, 2006  
Human Embryonic Stem Cell Culture Training Courses  
American Society for Cell Biology  
San Diego, California

Member, 2007 to present  
Scientific Advisory Board  
[Pleuristem Innovations](#)  
Santee, California

Director, hESC Culture Training Course, March 2007  
Children's Hospital of Orange County  
Orange, California

Chemical Safety Officer, 4/01 - present  
Children's Hospital of Orange County Research Institute  
Orange, California

Faculty, Developmental Biology 245, Fall 2006  
Stem Cell Biology  
School of Biological Sciences  
University of California, Irvine, CA

Exhibitor, December, 2006  
Human Embryonic Stem Cell Culture Training Courses  
American Society for Cell Biology  
San Diego, CA

Ad-Hoc Member, NIH Study Section, October, 2006  
National Institutes of Health, NINDS  
NCF, Neurogenesis and Cell Fate

Panel Member, June 2006  
Annual NIH Human Embryonic Stem Cell Research Meeting

for R24 Infrastructure & T15 Training Course Grantees  
National Institutes of Health, NHLBI  
Toronto, Ontario Canada

Director, hESC Culture Training Course, March 2006  
Children's Hospital of Orange County  
Orange, California

Exhibitor, November, 2005  
Human Embryonic Stem Cell Culture Training Courses  
Society for Neuroscience  
Washington, DC

Member, 2005 to present  
Scientific Advisory Board  
[The Three Little Angels Foundation](#)  
Santa Barbara, California

Panel Member, November, 2005  
Southern California Association of Research Administrators  
Children's Hospital of Orange County  
Orange, California

Ad-Hoc Member, NIH Study Section, October, 2005  
National Institutes of Health, NINDS  
NCF, Neurogenesis and Cell Fate

Organizer, Moderator, and Speaker, California Tissue  
Engineering Meeting, September, 2005  
University of California, Irvine  
Irvine, California

Panel Member, June 2005  
Annual NIH Human Embryonic Stem Cell Research Meeting  
for R24 Infrastructure & T15 Training Course Grantees  
National Institutes of Health, NHLBI  
San Francisco, California

Director, hESC Culture Training Course, April 2005  
Children's Hospital of Orange County  
Orange, California

Panel Member, May 2005  
Understanding the Promise and Problems of Stem Cells  
University of California, Irvine  
Irvine, California

Exhibitor, November, 2004  
Human Embryonic Stem Cell Culture Training Courses  
Society for Neuroscience  
San Diego, California

Ad-Hoc Member, NIH Study Section, October, 2004  
National Institutes of Health, NINDS  
NCF, Neurogenesis and Cell Fate

Member, 2004 to present  
Scientific Advisory Board  
The Stem Cell Community  
<http://www.stemcellcommunity.org>  
La Jolla, California

Member, 2004 - 2006  
Stem Cell Research Steering Committee  
University of California, Irvine  
Irvine, California

Member, 2004 – present  
Center for Stem Cell Transplantation  
Children's Hospital of Orange County  
Orange, California

Moderator and Panel Discussant, June 2004  
Stem Cells and Fragile X  
International Fragile X Symposium  
Washington, DC

Panel Member, June 2004  
Annual NIH Human Embryonic Stem Cell Research Meeting  
for R24 Infrastructure & T15 Training Course Grantees  
National Institutes of Health, NHLBI  
Washington, DC

Organizer, Moderator, and Panel Discussant, May 2004  
Stem Cells: Science, Ethics, and Politics in Dialogue  
UCI/CHOC Research Institute  
Irvine, California

Ad-Hoc Member, NIH Study Section, July 2004  
National Institutes of Health, NIA  
ZAG1 ZIJ-7 01  
Biology of Stem Cells in Aging

Director, hESC Culture Training Course, April 2004

Children's Hospital of Orange County and  
The Burnham Institute, La Jolla, CA

Member, 2004 - present  
Institutional Bioethics Committee  
Children's Hospital of Orange County  
Orange, California

Ad-Hoc Member, NIH Study Section, November 2003  
National Institutes of Health  
ZRG1 SSS-U(10) B  
Small Business Innovation &  
Bioengineering Research Grants

Exhibitor, November, 2003  
Human Embryonic Stem Cell Culture Training Courses  
Society for Neuroscience  
New Orleans, Louisiana

Ad-Hoc Member, NIH Study Section, July 2003  
National Institutes of Health  
ZRG1 SSS-U(40) P  
Biomedical Technology Resource Grant

Organizer and Chair, May 2003  
Laboratory Techniques and Protocols for Human Neural  
Stem Cells  
UCI/CHOC Research Institute  
Orange, California

Member, 2003 - present  
Institutional Animal Care and Use Committee  
Children's Hospital of Orange County  
Orange, California

Panel Member, 2002  
International Workshop in Brain Banking  
National Institute of Neurological Disorders and Stroke  
*"Human Neural Stem Cell Banking"*

Founder, 2002  
National Human Neural Stem Cell Resource  
Children's Hospital of Orange County  
Orange, California

Organizer and Chair, November 2001  
CHOC/UCI Workshop on Neural Stem Cells

Children's Hospital of Orange County  
Orange, California

Member, 2001 - present  
Facilities/Equipment Committee  
Children's Hospital of Orange County  
Orange, California

Member, 2001 - present  
IRB Scientific Review Board  
Children's Hospital of Orange County  
Orange, California

Member, 2000 - 2004  
Scientific Advisory and Review Board  
Children's Hospital of Orange County  
Orange, California

Member, 1999 - present  
Research Safety Committee  
Children's Hospital of Orange County  
Orange, California

Member, 1998 – present  
Neurology Search Committee  
Children's Hospital of Orange County  
Orange, California

Member, 2005 – present  
Neurosurgery Search Committee  
University of California, Irvine  
School of Medicine  
Orange, California

Member, Faculty Interview Committee, 1992-1993  
Office of Admissions  
College of Medicine  
University of California, Irvine

Course in Pharmacokinetics, Spring, 1989  
Biomedical Simulations Resource  
School of Engineering  
University of Southern California  
*"Advanced Methods of Pharmacokinetic and  
Pharmacodynamic Systems Analysis"*

Course in On-line MEDLINE Searching, Fall, 1987

Pacific Southwest Regional Medical Library Service  
Biomedical Library  
University of California, Los Angeles  
*"National Library of Medicine Initial On-Line Training"*

Mentor, 1986 – present

Research and Medical Education Programs  
Children's Hospital, Los Angeles, Los Angeles, California  
Memorial Miller Children's Hospital, Long Beach, California  
Children's Hospital of Orange County, Orange, California  
University of California, Irvine

*Mentored Medical/Research Scientists:*

*Current:*

David Brick, PhD, CHOC  
Alexander Stover, BS, CHOC  
Anthony Rangel, BS, CSU, Fullerton  
Darrius Gleason, BS, JD, UCI

*Past:* (current positions also listed)

Julie Berkley, BS, Amherst  
Andrew Yunghans, BS, CSU, Fullerton  
Shengwen Li, PhD, Senior Scientist, CHOC  
Project Scientist, UCI  
Tomas Dolezal, PhD, Post-Doctoral Student, UCI  
Scientist, Prague, Czech Republic  
Stanka Derzic, PhD, Scientist, CHOC, deceased  
Hubert Nethercott, BS, Research Assistant, CHOC  
Graduate Student, Northwestern University  
Tannin Fuja, BS, Graduate Student, UCI  
Medical Student, University of Iowa  
Boback Zaieian, BS, Research Assistant, CHOC  
Medical Student, UCI  
Ivan Kirov, BS, Research Assistant, CHOC  
Graduate Student, NYU  
Rick Harrison, M.D., PICU Fellow, CHLA  
Co-Director, PICU, UCLA  
Sana Al-Jundi, M.D., PICU Fellow, CHLA  
Pediatric Intensivist, CHOC  
Daniel Fisher, M.D., PICU Fellow, MMCH  
Associate Professor, Connecticut Children's MC  
Gerardo Reyes, M.D., PICU Fellow, CHLA  
Clinical Asst Professor, U Illinois  
Mark Welch, M.S., Neurology Associate, CHOC  
Psychiatry Resident, Loma Linda University  
Maher Eldadah, M.D., PICU Fellow, CHLA  
Medical Director, PICU, Hillcrest MC  
Yacov Sivan, M.D., PICU Fellow, CHLA  
Director, PICU, Dana Children's Hospital

Ronald Gottesman, M.D., PICU Fellow, CHLA  
Director, Ped CCM, Montreal Children's Hospital

Students Trained during the hESC Training Courses

<b><u>Student (Nationality)/ PI</u></b>	<b><u>Title</u></b>	<b><u>Institution</u></b>	<b><u>City, State COUNTRY</u></b>
Sharona Even-Ram, PhD (Israel)/ Kenneth Yamada, PhD	Post-Doctoral Fellow	National Institutes of Health- NIDCR	Bethesda, MD USA
Dawn Darling, MD (England)/ Dawn Darling, MD	Neonatologist	University of California, San Diego	San Diego, CA USA
Hao Wu, BS (China)/ Yi Sun, PhD	Graduate Student	University of California, Los Angeles	Los Angeles, CA USA
Sun-Kyung Oh, PhD (Korea)/ Shin-Yong Moon, MD	Post-Doctoral Fellow	Institute of Reproductive Medicine	Seoul KOREA
Shuxian Jiang, PhD (USA)/ Hava Avraham, PhD	Post-Doctoral Fellow	Harvard	Boston, MA USA
Chu Chih Shih, PhD (USA)/ Chu Chih Shih, PhD	Professor	City of Hope	Duarte, CA USA
Manjiri Bakre, PhD (India)/ Lawrence W Stanton, PhD	Research Scientist	Genome Institute of Singapore	Singapore SINGAPORE
Soumya Koppikar, BS (India)/ Satish Totey, PhD	Research Fellow	Reliance Life Sciences	Mumbai INDIA
Brandi Ormerod, PhD (Canada)/ Theo Palmer, PhD	Post-Doctoral Fellow	Stanford University	Stanford, CA USA
Lisa Flanagan, PhD (USA)/ Michael Selsted, MD, PhD	Post-Doctoral Fellow	University of California, Irvine	Irvine, CA USA
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Suparna Sanyal, PhD (Canada)/ BDBiosciences	Research Scientist	BD Biosciences	Bedford, MA USA
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Laura Perin, PhD (Italy)/ David Warburton, PhD	Senior Scientist	University of Southern California	Los Angeles, CA USA

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Janet Paluh, PhD(USA)/ Janet Paluh, PhD	Assistant Professor	Boston College	Boston, MA USA
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Thorsten Schlaeger, PhD (Germany)/ Thorsten Schlaeger, PhD	Head, ESC Core	Children's Hospital of Boston	Boston, MA USA
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Keigo Machida, PhD (Japan)/ Michael Lai, MD, PhD	Assistant Research Professional	University of Southern California	Los Angeles, CA USA
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Qiulian Wu, DDS (China)/ Jeremy Rich, MD	Lead Technologist	Cleveland Clinic Foundation	Cleveland, OH USA
Michelle Wedemeyer, BS (USA)/ Hans Keirstead, PhD	MD/PhD Student	University of California, Irvine	Irvine, CA USA
Jing Yang, MD (China)/ Henry Klassen, MD, PhD	Research Specialist	University of California, Irvine	Irvine, CA USA
Desiree Salazar, BS (USA)/ Leslie Thompson, PhD	Graduate Student	University of California, Irvine	Irvine, CA USA
Lisa Salazar, PhD (USA)/ Leslie Thompson, PhD	Assistant Specialist	University of California, Irvine	Irvine, CA USA
Miriam Hickey, PhD (Ireland)/ Marie-Francoise Chesselet, PhD	Assistant Researcher	University of California, Los Angeles	Los Angeles, CA USA
Zoltan Simandi, MS (Hungary)/ Laszlo Nagy, MD, PhD	Graduate Student	University of Debrecen	Debrecen HUNGARY
Christine Scheller, BA (USA)/ Free-Lance	Science Writer	Southern California	Costa Mesa ,CA USA
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**Peer-Reviewer – Journal and Grant Foundations:**

Neurobiology of Disease  
Nature Methods  
Journal of Translational Research  
European Journal of Pharmacology  
Pediatric Research  
Neurology  
Neuroscience  
Clinical Chemistry  
Stem Cells  
Stem Cells and Development  
Journal of Neuroscience Research  
Brain Research Bulletin  
Current Stem Cell Research and Therapy  
STAR Research Program (Singapore)  
Autism Speaks  
NLM Foundation Autism Research Program  
Neurological Foundation of New Zealand  
New York State Stem Cell Science

**Senior Coder, 5/80-10/80**  
Brain Information Service  
Brain Research Institute

School of Medicine  
University of California, Los Angeles

Teaching Assistant, 9/76-6/78  
Organic Chemistry  
Department of Chemistry  
Seattle University

Teaching Assistant, 9/76-6/78  
Analytical Chemistry  
Department of Chemistry  
Seattle University

**HONORS:**

2008 UK-US Stem Cell Collaboration Development Award  
Visiting Scientist, University of Oxford, Oxford, UK  
2008 UK-US Stem Cell Collaboration Development Award  
Visiting Scientist, King's College, London, UK  
"Kudo for Making a Mark", CHOC, April 2009  
"Kudo for Making a Mark", CHOC, March 2009  
"Kudo for Making a Mark", CHOC, March 2008  
"Kudo for Making a Mark", CHOC, May 2008  
"Kudo for Making a Mark", CHOC, June 2007  
Distinguished Service Award, CHOC, 2006  
Nomination for Counselor, Mitochondrial Med Society, 2002  
First Prize - UCLA Neurosci Student Poster Comp, 1988  
Honorable Mention- NSF Graduate Fellowship - 1979  
National Research Service Awards, 1979-1983  
Dean's List, 1974-1978  
Alpha Epsilon Delta - The Premed Honor Soc, 1974-1978  
Chemistry Club of Seattle University, 1974-1978  
President of Alpha Epsilon Delta, Seattle U Chapter, 1976  
Vice-president of the Chemistry Club - Seattle U, 1974-1976

**MEMBERSHIPS:**

International Society for Stem Cell Research  
American Society of Reproductive Medicine  
American Society for Human Genetics  
Society for Inherited Metabolic Disorders  
Society for Mitochondrial Medicine  
Society for Developmental Biology  
Society for Neuroscience

**OTHER ACTIVITIES:**

Participant, 2007 – present  
"Ask a Scientist"  
Irvine Unified School District  
Irvine, California

Sunday School Teacher, 6/05 – present  
Mariner's Church  
Newport Beach, California

Founder and Sole Proprietor, 7/93 - present  
Schwartz Renovation  
Irvine, California

CA Licensed General Contractor, #B688575, 1/94 - present  
Schwartz Renovation  
Irvine, California

Partner, 1/92 - present  
Gonzalez Investments, LLC  
Washington, DC

Chair, Buildings and Grounds, 1/95 – 12/01  
Saint Andrew's Episcopal Church  
Irvine, California

People's Warden, 1/99 – 12/01  
Saint Andrew's Episcopal Church  
Irvine, California

Board Member, 1/99 – 12/01  
Saint Andrew's Episcopal Church Children's Center  
Irvine, California

Laboratory Design Consultant, 8/96 – 12/96  
Neurobiology Laboratory  
Children's Hospital of Orange County  
Orange, California

Project Manager, 1/94 - 12/94  
Mobile Lead Reclamation Facility  
Western Environmental Science and Technology  
Coto de Caza, California

Board of Directors, 1/82 - 12/90  
Column Engineering, Inc.  
Ontario, California

Laboratory Design Consultant, 9/82-12/82  
Pediatric ICU Research Laboratory  
Children's Hospital, Los Angeles  
Los Angeles, California

## **Government Representative, On-Line, Print, Radio, and Television Media Interviews and Philanthropic and Elementary School Presentations**

May 2008, Boulevard Pictures, "Lines that divide", Jack Hafer (Television)  
March 2008, Orange County Register, "Do scientists believe in God?", Gary Robbins (print)  
January 2008, Orange County Register, "UCI develops faster, cheaper way to sort stem cells", Gary Robbins (on-line)  
November 2007, Orange County Register, "O.C. biologists have differing takes of stem cell advance", Gary Robbins (on-line)  
June 2007, Orange County Register, "Scientists get embryonic stem cells from adult stem cells without destroying embryo", Gary Robbins (print)  
April 2007, Orange County Register, "UCI holds town hall-style meeting on stem cells", Gary Robbins (print)  
November 2006, Fullerton Union High School, "Stem Cell Research" (Jessica Horner (Video Interview)  
October 2006, KTVB, "Joy in Our Town", Mary Scott (television)  
September 2006, Orange County Register, "Embryonic Stages", Courtney Perkes (print)  
August 2006, Orange County Register, "Scientists get stem cells without destroying embryo", Nicholas Wade, New York Times (print)  
July 2006, Orange County Register, "UCI center director: Veto would have little effect here", Lisa Liddane and Theresa Walker (print)  
April 2006, Orange County Register, "Reader Rebuttal: Led Astray by Quackery", Philip H. Schwartz (print)  
March 2006, KFWB Radio, Laurie Kelman (radio)  
February 2006, Lansing State Journal, "Stem Cell Research", Jeremy Steele (print)  
January 2006, Center for Jewish Education, Corona del Mar, CA (philanthropic)  
November 2005, Cinderella Guild, Costa Mesa, CA (philanthropic)  
September 2005, Christianity Today, "Ethics Interrupted", Christine Scheller (print)  
August 2005, The Roosters (philanthropic)  
July 2005, Orange County Register, "Faith in Science", Gary Robbins (print)  
July 2005, Frontline. "The Stem of Hope", Vijaya Swaminath (on-line)  
June 2005, private conversation, Senator Tom Harkin (US government)  
April 2005, Science News, "Full Stem Ahead", Christen Brownlee (print)  
May 2005, Orange County Register, "House passes Stem Cell Bill" (print)  
May 2005, National Public Radio, Lance Orosco (radio)  
May 2005, KABC Radio (radio)  
February 2005, San Diego Business Journal, "Stem Cell Science: Hospitals look to Possibilities", Hilary Potkewitz (print)  
July 2005, Cable Network, "Alternative Focus", Bruce Crawford (television)  
August 2005, Cable Network, "ACRU", Bruce Crawford (television)  
2005, Channel 4 News, "Evening News", Vicki Vargas (television)  
2004, Channel 4 News, "Evening News", Vicki Vargas (television)  
2003, Channel 4 News, "Evening News", Vicki Vargas (television)  
June 2003, Milwaukee Journal Sentinel, "UW makes Stem Cell Progress", Kimm Groshong (print)  
July 2004, Orange County Register, "Commentary: Stem Cell Scientists are in Short

Supply”, Philip H. Schwartz (print)

October 2000, Melinda Heights Elementary School, “How to fix a broken brain” (class presentation)

October 1998, Melinda Heights Elementary School, “The earth’s moon” (class presentation)

### **MANUSCRIPTS – published and in press:**

1. Gopalakrishnan S, Van Emburgh BO, Shan J, Su Z, Fields CR, Vieweg J, Hamazaki T, Schwartz PH, Terada N, and Robertson KD “*A novel DNMT3B splice variant expressed in tumor and pluripotent cells modulates genomic DNA methylation patterns and displays altered DNA binding*” *Molecular Cancer Research* (2007 Impact Factor 4.317), in press, 2009.
2. Wang RY, Cambray-Forker EJ, Ohanian K, Karlin DS, Covault KK, Schwartz PH, and Abdenur JE “*Treatment reduces severity of brain imaging abnormalities in patients with MPS I and II*” *Molecular Genetics and Metabolism* (2007 IF 2.55), in press, 2009.
3. Schwartz PH and Kalichman MW “*Ethical Challenges to Cell-Based Interventions for the Central Nervous System: Some Recommendations for Clinical Trials and Practice*” *American Journal of Bioethics* (2007 IF 3.934), 9:41-43 (2009).
4. Pistollato F, Chen HL, Schwartz PH, Basso G and Panchision DM “*Hypoxia represses the differentiative effects of BMPs in high grade glioma*” *Stem Cells* (2007 IF 7.531), 27:7-17 (2009).
5. Schwartz, P.H., “Training the next generation of pluripotent stem cell researchers”, *Journal of Translational Medicine* (2007 IF 2.94) 6:40 (2008).
6. Luo MH, Schwartz, PH, Fortunato, EA “*Neonatal neural progenitor cells (NPCs) and their neuronal and glial derivatives are fully permissive for human cytomegalovirus infection*” *Journal of Virology* (2007 IF 5.332), 82:9994-10007 (2008).
7. Jingxin Qiu, Lingbao Ai, Cheppail Ramachandran, Bing Yao, Suhasni Gopalakrishnan, C. Robert Fields, Amber L. Delmas, Lisa M. Dyer, Steven J. Melnick, Anthony T. Yachnis, Philip H. Schwartz, Howard A. Fine, Kevin D. Brown, and Keith D. Robertson “*Invasion suppressor cystatin E/M (CST6): High-level cell type-specific expression in normal brain and epigenetic silencing in brain tumors*” *Laboratory Investigation* (2007 IF 4.479), 88:910-925 (2008).
8. Klassen, Henry; Warfvinge, Karin; Schwartz, Philip; Kiilgaard, Jens; Shamie, Neda; Jiang, Caihui; Samuel, Melissa; Scherfig, Erik; Prather, Randall; Young, Michael “*Isolation of progenitor cells from GFP-transgenic pigs and transplantation to the retina of allorecipients*” *Cloning and Stem Cells* (2007 IF 2.937), 10:391-402 (2008).
9. Mueller, FJ, Kostka, D, Ulitsky, I, Williams, R, Laurent, L, Lu, C, Rao, MS, Shamir, R, Schwartz, PH, Schmidt, NO, Loring, JF “*Regulatory networks define phenotypic classes of human stem cell lines*” *Nature* (2007 IF 28.751), 455:401-5 (2008).
10. Schwartz, P.H., Brick, D.J., Stover, A.E., Loring, J.F., and Mueller, F.J. “*Differentiation of Neural Lineage Cells from Human Pluripotent Stem Cells*” *Methods* (2007 IF 3.667), 45:142-158 (2008).

11. Schwartz, P.H. and Brick, D.J. "*Stem Cell Therapies for the Lysosomal Storage Diseases – the Quintessential Neurodegenerative Diseases*" Current Stem Cell Research and Therapy (2007 IF 2.94), 3:88-98 (2008).
12. Pistollato F, Chen HL, Schwartz PH, Basso G and Panchision DM "*Oxygen tension controls the expansion of human CNS precursors and the generation of astrocytes and oligodendrocytes*" Molecular and Cellular Neuroscience (2007 IF 3.994) 35:424-435 (2007).
13. Lee, J.P., Lee, P.J., Takahashi, H., Jeyakumar, M., Clark, D., Clarke, J., Tong, G., Wenger, D., Platt, F.M., Seyfried, T.M., Schwartz, P., Lipton, S.A., and Snyder, E.Y. "*Stem cells act through multiple mechanisms to benefit mice with neurodegenerative metabolic disease*" Nature Medicine (2007 IF 26.382) 13:439-447 (2007).
14. Klassen H, Schwartz PH, Ziaieian B, Nethercott H, Young MJ, Bragodottir R, Tullis GE, Warfvinge K and Narfstrom K "*Neural precursors isolated from the developing cat brain show retinal integration following transplantation to the retina of the dystrophic cat*" Veterinary Ophthalmology (2007 IF 0.820) 10:245-253 (2007).
15. Terskikh, A. Bryant, P.J., and Schwartz, P.H. "*Mammalian Stem Cells*" Pediatric Research (2007 IF 2.839), 59(4) 13R-20R (2006).
16. Schwartz, P.H. and Rae, S.B. "*Ethical Donation of Human Embryos for Harvest of Stem Cells*" Reproductive Biomedicine Online (2007 IF 2.840), 12:771-775 (2006).
17. Schwartz, P.H. "*The Potential of Stem Cell Therapies for Neurological Diseases*" Expert Reviews in Neurotherapeutics (2007 IF), 6:153-61 (2006).
18. Flanagan, L.A., Rebaza, L.M. Derzic, S, Schwartz, P.H., and Monuki, E.S. "*Conserved Regulation of Human and Mouse Cortical Neural Stem Cells by Extracellular Matrix*" Journal of Neuroscience Research (2007 IF 3.268), 83:845-856 (2006).
19. CM Greco, RF Berman, RM Martin, F Tassone, PH Schwartz, J Grigsby, D Hessl, EJ Becker, J Papazian, S Bacalman, MA Leehey , RJ Hagerman, PJ Hagerman "*Neuropathology of fragile X-associated tremor/ataxia syndrome (FXTAS)*" Brain (2007 IF 8.568), 129:243-255 (2006).
20. Arocena, D.G., Iwahashi, C.K., Beilina, A., Ludwig, A.L., Schwartz, P.H., and Hagerman, P.J. "*Induction of inclusion formation and disruption of lamin A/C structure by permutation CGG-repeat RNA in human cultured neural cells*" Human Molecular Genetics (2007 IF 7.806), 14(23):3661-71 (2005).
21. Schwartz, P.H., Nethercott, H.E., Kirov, I.I., Ziaieian, B., Young, M.J., and Klassen, H. "Expression of Neurodevelopmental Markers by Cultured Porcine Neural Precursor Cells" Stem Cells (2007 IF 7.531), 23(9):1286-94 (2005).
22. Chung, B.G., Flanagan, L.A., Rhee, S.W., Schwartz, P.H., Lee, A.P., Monuki, E.S., Jeon, N.L. "*Human Neural Stem Cell Growth and Differentiation in a Gradient-Generating Microfluidic Device*" Lab on a Chip (2007 IF 5.068), 5(4):401-6 (2005).
23. Schwartz, P.H., Tassone, F., Greco, C.M., Nethercott, H.E., Ziaieian, B., Hagerman, R.J., and Hagerman, P.J. "*Neural Progenitor Cells from an Adult Patient with Fragile X Syndrome*" BMC Medical Genetics (2007 IF 2.419), 6:2-24 (2005).

24. Klassen, H., Ziaieian, B., Kirov, I.I., Young, M.J., and Schwartz, P.H. "Isolation of Retinal Progenitor Cells from Postmortem Human Tissue with Comparison to Autologous Brain Progenitors" J. Neurosci. Res. (2007 IF 3.268), 77:334-343 (2004), with cover.
25. Beilina, S., Tassone, F., Schwartz, P.H., Sahota, P., and Hagerman, P.J. "Redistribution of transcription start sites within the FMR1 promoter region with expansion of the downstream CGG-repeat element" Hum. Mol. Genet. (2007 IF 7.806) 13:543-549 (2004).
26. Fuja, T.J., Schwartz, P.H., Darcy, D. and Bryant, P.J. "Asymmetric Localization of LGN but not AGS3, Two Homologs of Drosophila Pins, in Dividing Human Neural Progenitor Cells." J. Neurosci. Res. (2007 IF 3.268) 75:782-793 (2004), with cover.
27. Schwartz, P.H., Bryant, P.J., Fuja, T.J., Su, H., O'Dowd, D.K., and Klassen, H.K. "Isolation and Characterization of Neural Progenitor Cells form Post-Mortem Human Cortex." J. Neurosci. Res. (2007 IF 3.268)74:838-851 (2003), with cover.
28. Palmer, T.D., Schwartz, P.H., Taupain, P., Kaspar, B., Stein, S.A., and Gage, F.H. "Stem Cells grown from Postmortem Human Brain" Nature (2007 IF 28.751)411:42-43 (2001).
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32. Schwartz, P.H. and Wasterlain, C.G. "Determination of Serum and Brain Concentrations of Neuroprotective and Non-Neuroprotective Doses of MK-801" J Neurol Sci (2007 IF 2.315) 115(1):26-31 (1993).
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35. Schwartz, P.H., Massarweh, W.F., Vinters, H.V., Dwyer, B.E., Fujikawa, D.G., and Wasterlain C.G. "A Rat Model of Severe Neonatal Hypoxic-Ischemic Brain Injury" Stroke (2007 IF 6.296) 23:539-546 (1992).
36. Wasterlain, C.G., Hattori, H., Adams, L.M., and Schwartz, P.H. "Felbamate reduces Hypoxic-Ischemic Brain Damage In Vivo" Eur. J. Pharmacol. (2007 IF 2.376) 212:275-278 (1992).
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- of Dopamine in Infants and Children*" Crit. Care Med. (2007 IF 6.283), 19:1008-1011 (1991).
39. Sivan, Y., Schwartz, P.H., Schonfeld, T., Cohen, I.J., and Newth, C.J. "*Outcome of Oncology Patients in the Pediatric Intensive Care Unit*" Intensive Care Med. (2007 IF 4.623), 17:11-15 (1991).
  40. Schwartz, P.H., Eldadah, M.K., and Newth, C.J.L. "*The Pharmacokinetics of Dobutamine in Pediatric Intensive Care Unit Patients*" Drug Metab. Dispos. (2007 IF 3.907), 19:614-619 (1991).
  41. Hattori, H., Morin, A.M., Schwartz, P.H., Fujikawa, D.G., and Wasterlain, C.G. "*Post-Hypoxic Treatment with MK-801 reduces Hypoxic-Ischemic Damage in the Neonatal Rat*" Neurology (2007 IF 6.014) 39:713-718 (1989).
  42. Sinniah, D., Schwartz, P.H., Mitchell, R.A., and Arcinue, E.L. "*Investigation of an Animal Model of a Reye-like Syndrome Caused by Margosa Oil*" Ped. Res. (2007 IF 2.839) 19:1346-1355 (1985).

#### **MANUSCRIPTS – editorial or intellectual assistance:**

1. Klassen H, Kulgaard JF, Zahir T, Ziaeiian B, Kirov I, Scherfig E, Warfvinge K, Young MJ "*Progenitor cells from the porcine retina express photoreceptor markers after transplantation to the subretinal space of allorecipients*" Stem Cells 25:1222-1230 (2007).
2. Soen Y., Mori A., Palmer T.D., Brown P.O. "*Exploring the regulation of human neural precursor cell differentiation using arrays of signaling microenvironments*" Molecular Systems Biology 2:37-51 (2006).
3. Shivachar, A.C. "*Isolation and Culturing of Glial, Neuronal and Neural Stem Cell Types Encapsulated in Biodegradable Peptide Hydrogel*" Topics in Tissue Engineering, 4: Chapter 34 (2008).
4. Baharvand, et al., Royan Institute, Teheran, Iran, "*Safety of Local Implantation of Autologous CD133+ Enriched Bone Marrow Cells after Recent Myocardial Infarction: A Randomized Controlled Trial*"
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1. Schwartz, P.H., editor, Pediatric Applications of Stem Cells, Humana, in preparation
2. Schwartz, P.H. and Wesselschmidt, R.W., editors, Pluripotent Stem Cells: Methods and Protocols, Methods in Molecular Biology, Humana, in preparation

**EDITOR:**

1. Loring, J.L., Wesselschmidt, R.W., and Schwartz, P.H., editors, Human Stem Cell Manual: A Laboratory Guide, Elsevier/Cell Press (2007).

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2. 2009 International Congress on Inborn Errors of Metabolism "Treatment reduces severity of brain imaging abnormalities in patients with MPS I and II" Raymond Y Wang, Elizabeth Jane Cambray-Forker, Kirk Ohanian, David S Karlin, Kelly Covault, Philip H Schwartz, Jose E Abdenur
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#### International Invitations (declined):

Lecturer and Workshop Chair, 2004  
 International Brain Research Organization  
 Human Brain Tissue Autopsy Research in

Neurodegeneration and Neuroregeneration  
University of Sri Jayawardenepura  
Nugegoda, Sri Lanka

Lecturer and Workshop Chair, 2005  
Department of Anatomy  
Institute of Biomedical Sciences  
Federal University of Rio de Janeiro  
Rio de Janeiro, Brazil

Grant Reviewer, 2006  
National Grant Review  
Biosciences and Bioengineering Panel  
Strategic Research Cluster  
Scientific Foundation Ireland  
Dublin, Ireland

Lecturer and Workshop Chair, 2007  
Development, Regeneration, and Degeneration  
Neuronal Plasticity  
Celal Bayer University  
Izmir, Turkey

Symposium Speaker, 2008  
Biology of Embryonic and Adult Stem Cells  
Centre for Cellular and Molecular Biology  
Hyderabad, INDIA

**SITE VISIT PRESENTATIONS:**

ISSCR Meeting Headquarters, NIH, 6/08, (P.H. Schwartz, PI)  
*"Human Embryonic Stem Cell Culture Training Course"*

National Institutes of Health, NIH, 4/07, (P.H. Schwartz, PI)  
*"Human Embryonic Stem Cell Culture Training Course"*

ISSCR Meeting Headquarters, NIH, 6/06, (P.H. Schwartz, PI)  
*"Human Embryonic Stem Cell Culture Training Course"*

ISSCR Meeting Headquarters, NIH, 6/05, (P.H. Schwartz, PI)  
*"Human Embryonic Stem Cell Culture Training Course"*

National Institutes of Health, NIH, 6/04, (P.H. Schwartz, PI)  
*"Human Embryonic Stem Cell Culture Training Course"*

Children's Hospital of Orange County, NINDS, 7/02, (P.H. Schwartz, PI)

*"National Human Neural Stem Cell Resource"*

University of Miami, NICHD, 8/01, (H. R. Zielke and C. K. Petito, Pls)

*"Brain and Tissue Banks for Developmental Disorders"*

Eastern Maine Medical Center, NICHD, 5/01, (H. R. Zielke and C. K. Petito, Pls)

*"Brain and Tissue Banks for Developmental Disorders"*

University of Miami, NICHD, 2/01, (H. R. Zielke and C. K. Petito, Pls)

*"Brain and Tissue Banks for Developmental Disorders"*

University of Maryland, NICHD, 5/00, (H. R. Zielke and C. K. Petito, Pls)

*"Brain and Tissue Banks for Developmental Disorders"*

Children's Hospital of Orange County, NICHD, 11/99, (H. R. Zielke and C.K. Petito, Pls)

*"Brain and Tissue Banks for Developmental Disorders"*

University of Maryland, NICHD, 5/99, (H. R. Zielke and C. K. Petito, Pls)

*"Brain and Tissue Banks for Developmental Disorders"*

University of Maryland, NICHD, 6/97, (H. R. Zielke and C. K. Petito, Pls)

*"Brain and Tissue Banks for Developmental Disorders"*

University of Miami, NICHD, 2/97, (H. R. Zielke and C. K. Petito, Pls)

*"Brain and Tissue Banks for Developmental Disorders"*

**PRESENTATIONS:**

1. 3rd Annual Meeting of the International Society for Stem Cell Research, (2005), San Francisco, California - *"Human Embryonic Stem Cell Culture Training Courses"*
2. Keystone Symposium – Molecular Regulation of Stem Cells, (2005), Banff, Alberta, Canada – *"Human Embryonic Stem Cell Culture Training Courses"*
3. 34th Annual Meeting of the Society for Neuroscience (2004), San Diego, California - *"Differences among neural progenitor cell cultures determined by gene expression analysis"*
4. 9<sup>th</sup> International Fragile X Conference (2004) *"Neural Progenitor Cells from a Patient with Fragile X"*
5. 33rd Annual Meeting of the Society for Neuroscience (2003), New Orleans, Louisiana - *"Banking Human Neural Stem Cells from Post-Mortem Brain "*
6. 1st Annual Meeting of the International Society for Stem Cell Research, (2003), Washington, DC - *"Characterization of Post-Mortem Human Neural Stem Cells"*
7. 34th Annual Meeting of the American Society for Neurochemistry, (2003), Newport Beach, California - *"Characterization of Post-Mortem Human Neural Stem Cells"*
8. Keystone Symposium - From Stem Cells to Therapy, (2003), Steamboat Springs, Colorado - *"Characterization of Post-Mortem Human Neural Stem Cells"*

9. United Mitochondrial Disease Foundation Symposium, (2002), Dallas, Texas – *Neural Stem Cell Electrophysiology in Mitochondrial Disease – Proof of Concept*
10. Annual Meeting of the Society for Inherited Metabolic Disorders (2002), Asilomar, California - *"Neural Stem Cells from Autopsied Patients with Neurogenetic Disease"*
11. 30th Annual Meeting of the Society for Neuroscience (2000), New Orleans, Louisiana - *"The Utility of Post-Mortem Human Tissue for Research in Developmental Disorders of the Nervous System"*
12. 30th Annual Meeting of the Society for Neuroscience (2000), New Orleans, Louisiana - *"Isolation and Expansion of Neural Precursors from Postnatal and Adult Human Brain"*
13. 52nd Annual Meeting of the American Academy of Neurology (2000), San Diego, California - *"Harvest and Cryopreservation of Neural Precursors from Post-Natal, Post-Mortem Human Brain"*
14. 49th Annual Meeting of the American Society for Human Genetics (1999), San Francisco, California - *"Malignant Hyperthermia (MH), and Rhabdomyolysis (RM): A New Phenotype of Carnitine Palmitoyl Transferase Type II (CPTII) Deficiency?"*
15. 49th Annual Meeting of the American Society for Human Genetics (1999), San Francisco, California - *"Short Chain Acyl-CoA Dehydrogenase Deficiency (SCADD) - An Under-Reported Disorder?"*
16. 51st Annual Meeting of the American Academy of Neurology (1999), Toronto, Ontario - *"Neuronal Cell Cultures from Cryopreserved Fetal Tissue with Neurogenetic Disease"*
17. Annual Meeting of the Society for Inherited Metabolic Disorders (1999), Lake Lanier, Georgia - *"Ethylmalonic Encephalopathy with Seizures and Renal Failure"*
18. 22nd Annual Meeting of the Society for Neuroscience (1992), Anaheim, California - *"Behavioral, Physiological, and Pharmacological Aspects of Stimulus-Induced Post-Anoxic Myoclonus in the Rat"*
19. 44th Annual Meeting of the American Academy of Neurology, (1992), San Diego, California - *"In Vivo Activation of NMDA Receptors during Seizures measured by MK-801 Binding"*
20. 21st Annual Meeting of the Society for Neuroscience (1991), New Orleans, Louisiana - *"In Vivo Activation of NMDA Receptors during and after Ischemia measured by In Vivo <sup>3</sup>H-MK-801 Binding"*
21. 20th Annual Meeting of the Society for Neuroscience (1990), St. Louis, Missouri - *"A Post-Hypoxic Model of Myoclonus in the Rat"*
22. 20th Annual Meeting of the Society for Neuroscience (1990), St. Louis, Missouri - *"Felbamate reduces Neonatal Hypoxic-Ischemic Brain Damage in the Rat"*
23. 1st International Congress of Movement Disorders, Workshop on Animal Models of Myoclonus (1990), Washington, D.C. - *"A Post-Hypoxic Model of Myoclonus in the Rat"*
24. 74th Annual Meeting of the Federation of American Societies for Experimental Biology (1990), Washington, D.C. - *"Brain Concentrations of Free MK-801 reflect Serum Concentrations rather than Total Brain Concentrations"*
25. 74th Annual Meeting of the Federation of American Societies for Experimental Biology (1990), Washington, D.C. - *"Interactive Pharmacokinetics of Dopamine and Dobutamine in Pediatric Intensive Care Unit (PICU) Patients"*

26. 59th Annual Meeting of the Society for Pediatric Research (1990), Anaheim, California - *"Competitive Dispositional Processes may account for Non-Linear Catecholamine Pharmacokinetics and Pharmacodynamics"*
27. 19th Annual Meeting of the Society for Neuroscience (1989), Phoenix, Arizona - *"The Effect of Hypoxia/Ischemia on the Disposition of MK-801 in the Neonatal Rat"*
28. 41st Annual Meeting of the American Academy of Neurology (1989), Chicago, Illinois - *"Cardiac Arrest Alters the Metabolism of MK-801 in the Rat"*
29. 14th Annual Meeting of SAS Users Group International (1989), San Francisco, California - *"The Application of Base SAS<sup>®</sup>, SAS/STAT<sup>®</sup>, and SAS/GRAPH<sup>®</sup> Software to the Analysis and Presentation of Pharmacokinetic Data"*
30. 17th Annual Meeting of the Society for Neuroscience (1987), New Orleans, Louisiana - *"The Development and Distribution of Brain Damage after Cardiac Arrest in the Rat."*
31. 16th Annual Meeting of the Society for Neuroscience (1986), Washington, D.C. - *"Ten Minutes of Cardiac Arrest in the Rat"*
32. 15th Annual Meeting of the Society for Neuroscience (1985), Dallas, Texas - *"Altered Protein and Amino Acid Metabolism in an Animal Model of a Reye-like Syndrome"*
33. 69th Annual Meeting of the Federation of American Societies for Experimental Biology (1985), Anaheim, California - *"Production of Reye-like Mitochondrial Hepatic Enzyme Deficits in the Rat by Margosa Oil Treatment"*
34. 36th National Meeting of the American Association for Clinical Chemistry (1984), Washington, D.C. - *"Simultaneous Determination of Plasma Dobutamine (Dobutrex), Dopamine, Isoproterenol, and Epinephrine by Gradient, Reverse-Phase, HPLC with Electrochemical Detection"*
35. 4th International Conference on Reye's Syndrome (1984), Columbus, Ohio - *"A Time Course Study of an Animal Model of Reye's Syndrome. I. Hepatic Enzyme and Histologic Parameters"*
36. 4th International Conference on Reye's Syndrome (1984), Columbus, Ohio.- *"Production of Reye-like Mitochondrial Hepatic Enzyme Deficits in the Rat by Margosa Oil Treatment"*
37. 52nd Annual Meeting of the Society for Pediatric Research (1983), Washington, D.C. - *"A Possible Animal Model of Reye's Syndrome using Margosa Oil"*
38. 11th Annual Meeting of the Society for Neuroscience (1981), Los Angeles - *"Continuous Amphetamines - Switch from Stereotypical to Hallucinogen-like Behaviors are Correlated with Changes in Caudate but not Accumbens Dopamine Receptors"*

#### **INTERNATIONAL INVITED LECTURES:**

1. 2009, Oxford Stem Cell Institute, Oxford University, Oxford, England, *"Stem cell neurotherapy for treatment of the lysosomal storage diseases"*
2. 2009, King's College London, London, England, *"Stem cell neurotherapy for treatment of the lysosomal storage diseases"*
3. 2007, 4<sup>th</sup> Annual Symposium on Stem Cells and Regeneration, Imperial College London, London, England *"The Study of Neurogenetic Diseases using Post-Mortem Human Neural Progenitor Cells"*

**INVITED LECTURES:**

1. 2009, 3<sup>rd</sup> Annual Symposium – Stem Cell Therapy for Pediatric Diseases and Injuries: A Critical Appraisal, Children’s Hospital of Orange County, Orange, California *“Neural Stem Cell Neurotherapy in the Lysosomal Storage Diseases”*
2. 2008, Dean’s Colloquium, California State University Fullerton, Fullerton, California, *“Neural Stem Cell Neurotherapy in the Lysosomal Storage Diseases”*
3. 2008, 1<sup>st</sup> Annual Jefferson Symposium on Stem Cell Biology, Thomas Jefferson University, Philadelphia, Pennsylvania *“Regulatory networks define phenotypic classes of human stem cell lines”*
4. 2008, Fetal/Neonatal Board, St. Joseph Hospital, Orange, California *“Stem Cells”*
5. 2008, 2<sup>nd</sup> Annual Symposium – Stem Cell Therapy for Pediatric Diseases and Injuries: A Critical Appraisal, Children’s Hospital of Orange County, Orange, California *“Neural Stem Cell Neurotherapy in the Lysosomal Storage Diseases”*
6. 2007, CHOC Research Symposium, Children’s Hospital of Orange County, Orange, California *“Treatment of Sandhoff Disease with Neural Stem Cells”*
7. 2007, Monthly Grand Rounds, For OC Kids, Neurodevelopmental Center *“The Study of Neurogenetic Diseases using Post-Mortem Human Neural Progenitor Cells”*
8. 2007, Neuroscience Seminars, Center for Biomedicine and Genetics, City of Hope, Duarte, California, *“Using Stem Cells to Understand and Treat Neurological Diseases”*
9. 2007, GTCBio Symposium: Stem Cells – Research and Therapeutics, San Diego, CA, *“The Study of Neurogenetic Diseases using Post-Mortem Human Neural Progenitor Cells”*
10. 2006, Donor Meeting, Autism Speaks, New York, NY *“Human Neural Stem Cells from Human Post-Mortem Brain”*
11. 2006, CHOC/CSU Fullerton Symposium, Children’s Hospital of Orange County, Orange, California, *“Using Stem Cells to Understand and Treat Neurological Diseases”*
12. 2006, Psychiatry Grand Rounds, Loma Linda University Medical School, *“Overview of Some Stem Cell Issues”*
13. 2006, Plastic Surgery Research Council Annual Meeting, Dana Point, California *“Stem Cell Transplantation for Pediatric Brain Disease”*
14. 2006, The Genetics Center, Orange, California *“Stem Cell Transplantation for Pediatric Brain Disease”*
15. 2006, Michigan State University *“Stem Cell Transplantation for Pediatric Brain Disease”*
16. 2005, Psychiatry Grand Rounds, Loma Linda University Medical School, *“Overview of Some Stem Cell Issues”*
17. 2005, Southern California Association of Research Administrators, Children’s Hospital of Orange County, Orange, California *“Running a Human Embryonic Stem Cell Culture Training Course”*
18. 2005, Neurosurgery Grand Rounds, University of California, Davis, School of Medicine, *“Stem Cell Transplantation for Pediatric Brain Disease”*
19. 2005, California Tissue Engineering Meeting, University of California, Irvine *“Stem Cell Transplantation for Pediatric Brain Disease”*

20. 2005, Frontiers in Stem Cell Research, University of California, Irvine, *"Stem Cell Transplantation for Pediatric Brain Disease"*
21. 2005, The First Poe Symposium, California State University Channel Islands, *"Brain Transplants – Is This for Real?"*
22. 2005, Biola University, Symposium: How can Life come from a Culture of Death, *"Overview of Some Stem Cell Issues"*
23. 2005, SeaStar Brain Injury Foundation, Tustin, California, *"Stem Cells for the Treatment of Traumatic Brain Injury"*
24. 2005, 17<sup>th</sup> Annual Symposium, California State University Program for Education and Research in Biotechnology, Los Angeles, California *"Overview of Some Stem Cell Issues"*
25. 2004, Symposium: Developing Stem-Cell Therapies, University of California, Irvine, *"The Neonatal Brain as a Source of Stem Cells for Research and Transplantation"*
26. 2004, Grand Rounds, Children's Hospital of Orange County, *"The Neonatal Brain as a Source of Stem Cells for Research and Transplantation"*
27. 2004, Roundtable on Biomedical Engineering Materials and Applications (BEMA): Stem Cells as Biomaterials of the Future, National Academy of Sciences, *"Overview of Some Stem Cell Issues"*
28. 2004, Southern California Stem Cell Consortium, The Burnham Institute, *"Using Gene MicroArray Data as a Tool to Discover New Ways to Culture Stem Cells"*
29. 2003, Southern California Stem Cell Consortium, The Burnham Institute, *"Postmortem Human Neural Stem Cells - How easy is this?"*
30. 2003, Tulane University Medical Center, Center for Gene Therapy, New Orleans, Louisiana, *"Postmortem Human Neural Stem Cells - How easy is this?"*
31. 2003, Beckman Center, UCI, Laboratory Techniques and Protocols for Human Neural Stem Cells, *"Fetal and Adult Brain - Are they good sources of neural stem cells?"*
32. 2003, Beckman Center, UCI, Laboratory Techniques and Protocols for Human Neural Stem Cells, *"Repair of Human Nervous System Diseases with Neural Stem Cells"*
33. 2002, University of California, Davis, Davis, California, *"Pathology Grand Rounds: Human Neural Stem Cells – Past, Present and Future"*
34. 2002, Children's Hospital of Orange County, Orange, California, *"Grand Rounds: Human Neural Stem Cells – Past, Present and Future"*
35. 2002, Genetics Center, Orange, California, *"Pediatric Brain Banking – New Frontiers"*
36. 2002, UCI Science and Technology Series, Integrating New Technologies to Rebuild the Body, University of California, Irvine, *"Neuroscience Initiatives, Research Perspectives"*
37. 2002, International Workshop in Brain Banking, National Institute of Neurological Disorders and Stroke, *"Human Neural Stem Cell Banking"*
38. 2002, Departments of Neurology, Genetics, Pathology, University of California, Davis, *"Pediatric Brain Banking – New Frontiers"*
39. 2001, Departments of Neurology, Neonatal and Pediatric Critical Care, Children's Hospital and Regional Medical Center, *"Pediatric Brain Banking – New Frontiers"*

40. 2001, Departments of Pathology, University of Washington School of Medicine and Children's Hospital and Regional Medical Center, *"Pediatric Brain Banking – New Frontiers"*
41. 2001, Departments of Neonatal and Pediatric Critical Care, Children's Hospital of Orange County, *"Pediatric Brain Banking – New Frontiers"*
42. 2001, Grand Rounds, Children's Hospital of Orange County, *"Harvest of Post-Mortem Human Neural Stem Cells"*
43. 2000, Departments of Neurology, Genetics, Pathology, Neonatal and Pediatric Critical Care, Oregon Health and Science University, *"Pediatric Brain Banking – New Frontiers"*
44. 2000, Departments of Neurology, Genetics, Pathology, Neonatal and Pediatric Critical Care, Children's Hospital of Oakland, *"Pediatric Brain Banking – New Frontiers"*
45. 2000, Departments of Neurology, Genetics, Pathology, Neonatal and Pediatric Critical Care, University of California, San Francisco, School of Medicine, *"Pediatric Brain Banking – New Frontiers"*
46. 2000, Departments of Neurology, Genetics, Pathology, Neonatal and Pediatric Critical Care, Stanford University Medical Center, *"Pediatric Brain Banking – New Frontiers"*
47. 1999, Salk Institute, La Jolla, California, *"CHOC NIH Brain and Tissue Bank for Developmental Disorders - Specimens for Neuronal Culture"*
48. 1998, CHOC Research Program Seminar Series, Children's Hospital of Orange County, Orange, *"CHOC NIH Brain and Tissue Bank for Developmental Disorders – Past, Present, and Future"*
49. 1997, Department of Genetics, Children's Convalescent Hospital, Children's Hospital of San Diego, *"Pediatric Brain Banking – New Frontiers"*
50. 1992, Neuroscience Grand Rounds, University of California, Irvine, *"Excitotoxic Mechanisms of Ischemic Brain Damage in the Neonatal Rat"*
51. 1991, VAMC Research Seminar, Research Service, VAMC, Sepulveda, *"In Vivo Activation of NMDA Receptors during and after Ischemia"*
52. 1991, Grand Rounds Resident Research Symposium, Department of Neurology, University of California, Los Angeles, and, Excitatory Amino Acids Affinity Group, Brain Research Institute, University of California, Los Angeles, *"In Vivo Activation of NMDA Receptors during and after Ischemia"*
53. 1990, Neurology Research Seminars, Department of Neurology, Children's Hospital Los Angeles, *"Excitotoxic Mechanisms of Brain Damage in a Neonatal Rat Model"*
54. 1988, Pediatric Research Conferences, Huntington Memorial Hospital, Pasadena, California, *"Animal Models of Cerebral Ischemia: Selective Vulnerability and Delayed neuronal Death"*
55. 1988, Pediatric Research Conferences, Huntington Memorial Hospital, Pasadena, California, *"The Role of NMDA Receptors in Selective Neuronal Necrosis after Cerebral Ischemia"*
56. 1986, Neurology Research Seminars, Department of Neurology, Children's Hospital, Los Angeles, *"A Cardiac Arrest Model of Ischemic Brain Damage in the Adult Rat."*

57. 1985, PICU Research Seminars, Pediatric Intensive Care Unit, Childrens Hospital, Los Angeles, *"Biochemical Correlates of Irreversible Cell Injury after Cerebral Ischemia"*
58. 1985, Neurology Research Seminars, Department of Neurology, Veterans Administration Medical Center, Sepulveda, *"Altered Protein and Amino Acid Metabolism in an Animal Model of a Reye-like Syndrome"*
59. 1984, Neurology Research Seminars, Department of Neurology, Veterans Administration Medical Center, Sepulveda, *"The Margosa Oil Model of Reye's Syndrome"*
60. 1982, PICU Research Seminars, Pediatric Intensive Care Unit, Childrens Hospital, Los Angeles, *"Animal Models of Reye's Syndrome"*
61. 1982, Survey of the Neurological Sciences, Department of Neuroscience, University of California, Los Angeles, *"Modulation of Dopamine Receptors"*
62. 1981, Behavioral Pharmacology, Department of Psychology, University of California, Los Angeles, *"Neurotransmitter Receptor Binding"*
63. 1979, Seminar in Physiological Psychology, Department of Psychology, University of California, Los Angeles, *"Transmethylation Hypothesis of Schizophrenia"*