

CURRICULUM VITAE

RODNEY E. WILLOUGHBY, JR., M.D.

Professor of Pediatrics

Division of Infectious Diseases

Home Address:

14400 Juneau Avenue
Elm Grove, Wisconsin 53122-1665
(262) 784-0619

Office Address:

Suite C450, Children's Hospital of Wisconsin
PO Box 1997
Milwaukee, WI 53201-1997
Phone: (414) 337-7070
Fax: (414) 337-7093
Email: rewillou@mcw.edu

Place of Birth:

Houston, Texas

Citizenship:

U.S.A.

Education:

1973-1977 A.B., Princeton University, Princeton, NJ
1977-1982 M.D., Johns Hopkins School of Medicine, Baltimore, MD

Postgraduate Training and Fellowship Appointments:

1982-1984 Resident in Pediatrics (PL1, PL2)
University of California at San Diego
San Diego, CA
1984-1985 Resident in Pediatrics (PL3)
Johns Hopkins Hospital
Baltimore, MD
1985-1988 Fellowship, Pediatric Infectious Diseases
Johns Hopkins University
Baltimore, MD
1988-1993 Postdoctoral Fellowship, Carbohydrate Biochemistry
Laboratory of Gerald W. Hart
Department of Biological Chemistry
Johns Hopkins School of Medicine
Baltimore, MD
1996 Certificate, The Business of Medicine Program
Office of Continuing Medical Education
Johns Hopkins School of Medicine
Baltimore, MD

1998-2004 PhD program – not completed
Graduate Training Program in Clinical Investigation
Bloomberg School of Public Health
Johns Hopkins University
Baltimore, MD

Military Service: N/A

Faculty Appointments (Include Secondary Appointments):

1989-1991 Instructor of Pediatrics
Johns Hopkins University
Baltimore, MD

1991-2001 Assistant Professor of Pediatrics
Johns Hopkins University
Baltimore, MD

2001-2004 Associate Professor of Pediatrics
Johns Hopkins University
Baltimore, Maryland

2004-2009 Associate Professor of Pediatrics
Medical College of Wisconsin
Milwaukee, Wisconsin

2009-present Professor of Pediatrics
Medical College of Wisconsin
Milwaukee, Wisconsin

Administrative Appointments:

1994-1999 Director, Clinical Infectious Diseases
Department of Pediatrics
Johns Hopkins Hospital/Johns Hopkins University
Baltimore, MD

2010-present Director, Antibiotic Stewardship Program
Children's Hospital of Wisconsin
Milwaukee, WI

Educational Administrative Appointments:

1994-1999 Director, Fellowship Training Program in Pediatric
Infectious Diseases
Johns Hopkins University
Baltimore, MD

Hospital and Clinic Administrative Appointments: N/A

Hospital Staff Privileges:

1989-2004 Johns Hopkins Hospital
600 North Broadway Ave., Baltimore, Maryland 21287
2004-present Children's Hospital of Wisconsin
9000 West Wisconsin Ave., Milwaukee, WI 53226
2004-present Froedtert Memorial Lutheran Hospital
9200 West Wisconsin Ave., Milwaukee, WI 53226

Specialty Boards and Certifications:

<u>Board Certified</u>	<u>Issue Date</u>	<u>Expiration Date</u>
National Board of Medical Examiners		
American Board of Pediatrics	1988	
Subboard in Pediatric Infectious Diseases	1995	2001
Recertified	2002, 2008	2015

<u>Certificates</u>	<u>Issued By</u>	<u>Issue Date</u>	<u>Expiration</u>
N/A			

<u>Licensure</u>	<u>Number</u>	<u>Issue Date</u>	<u>Expiration</u>
Maryland License	D28484	1982	10/22/2009 (allowed to lapse)
California License	C41220	1983	10/22/2013 (allowed to lapse)
Wisconsin License	46340	2003	

Awards and Honors:

1982 Alpha Omega Alpha, Johns Hopkins University
1982 Phi Beta Kappa, Johns Hopkins University
1984 Harriet Lane Fellowship, Department of Pediatrics, Johns Hopkins University
1988 Physician Scientist Award, NIH Program Grant, Johns Hopkins University
1993 Eli Lilly Clinician Scientist Award, Johns Hopkins University
1996-2004 Best Doctors in America®
2005 Ultimate Health Care Hero, Small Business Times Health Care Heroes (health care team)
2006 Children's Miracle Achievement Award, Children's Miracle Network
2007 Translational Research Award, Medical College of Wisconsin
2007-2013 Best Doctors in America®
2014 Russell J Blattner Lectureship, Texas Children's Hospital
2104 Superhero of Medicine, Wisconsin Medical Society
2014 22nd Annual Fred J Heldrich, MD Pediatric Breakfast and Lecture, Saint Agnes Hospital
2015 American Academy of Pediatrics Unsung Heroes Award (to the Committee on Infectious Diseases)

Memberships in Professional and Honorary Societies:

American Academy of Pediatrics

Editorial Boards:

Ad hoc reviewer: Annals of Internal Medicine
Antiviral Research
Archives of Pediatrics and Adolescent Medicine
Clinical Immunology and Immunopathology
Clinical Infectious Diseases
Glycobiology
Infections in Medicine
Journal of Clinical Investigation
Journal of Infectious Diseases
Journal of Medical Virology
Journal of Pediatrics
Journal of Pediatric Infectious Diseases
Journal of Pediatric Infectious Disease Society
Journal of Perinatology
Medicine
Molecular and Cellular Biology
Pediatrics
Pediatric Infectious Diseases Journal
Public Library of Science (PLOS) Neglected and Tropical Diseases

Regional/Local/Appointed Leadership and Committee Positions:

1995-1998 Permanent Consultant, Immunizations and Infectious Diseases Committee,
Medical and Chirurgical Faculty of Maryland

2008-present Ad hoc Consultant, Bureau of Communicable Diseases, Wisconsin Division of
Public Health

National Elected/Appointed Leadership and Committee Positions:

1996 American Board of Pediatrics, Subboard of Pediatric Infectious Diseases, Member-Elect
1997-2000 American Board of Pediatrics, Subboard of Pediatric Infectious Diseases, Member

10/8/97 Research Advisory Council, ad hoc member
United Cerebral Palsy Research & Educational Foundation

5/11/00 Vaccines and Related Biological Products Advisory Committee, consultant
Centers for Biologics Evaluation and Research, Food and Drug Administration

1/03 Task Force on Neonatal Encephalopathy and Cerebral Palsy, consultant
American College of Obstetrics and Gynecology

3/28/05 National Center for Complementary and Alternative Medicine (NCCAM, NIH) Special
Emphasis Panel/Scientific Review Group 2005/05 ZAT1 JH (09), RFA AIDS, SRA J.
Hosseini; Chair DI Abrams

2006 - present Technical Advisory Group, member
Alliance for Rabies Control

2009-2015 Committee on Infectious Disease (COID, aka “Red Book”)
American Academy of Pediatrics

National or International Expert Workshops

3/4/1999 Working Group on Antimicrobial Cycling
Centers for Disease Control and Prevention

11/30-12/1/1999 Workshop “Infection in Pregnancy and Neurodevelopment”
Centers for Disease Control and Prevention

4/23/2002 Workshop “Roles for Cytokines in Developmental Disabilities”
United Cerebral Palsy (U.S.A.) and Little Foundation (U.K.)

10/22-23/2003 Workshop “Laboratory Methods in Neurodevelopmental Epidemiology:
Current Challenges”
Center for Disease Control and Prevention &
Center for Autism & Developmental Disabilities Research and Epidemiology

5/11-12/2006 Workshop “Rabies Treatment Working Group”
Center for Disease Control and Prevention

9/6/2007 Workshop “Rabies Treatment Working Group”
Center for Disease Control and Prevention

11/21-25/2007 “Management of human rabies”
National Training Workshop on Rabies Post-exposure Prophylaxis, Chinese
Centers for Disease Control and Prevention

2/10-11/2009 Working Group “Rabies Treatment Protocol for Brazil”
Ministry of Health, Brazil

9/17-18/2010 “Treatment of human rabies: 2010 National Conference on Rabies Prevention and
Control”,
Chinese Preventive Medicine Association

2/4-5/2013 “Approaches by the American Academy of Pediatrics to improve vaccine uptake
of the HPV vaccine”
National Vaccine Advisory Committee

5/21-23/2013 Smallpox Vaccine Clinical Utilization Workshop
Centers for Disease Control and Prevention

9/7-13/2013

“Update on Rabies Therapy (the Milwaukee Protocol)” (Hospital G Fricke, Viña del Mar)

“Treatment of Human Rabies” (Institute of Public Health, Santiago)
Ministry of Health of Chile

Research Grants, Contracts, Awards, Projects:

Peer Reviewed:

Title: Physician Scientist Award
Source: NIH/NDDK
Role: Investigator (PI: Simeon Margolis)
Dates: 1988-1990
Direct Funds: \$250,000

Title: Lilly Clinician Scientist
Source: Eli Lilly and Company
Role: Investigator (80% effort) (PI: Michael M.E. Johns, Dean)
Dates: 1993-1995
Direct Funds: \$100,000

Title: Pediatric AIDS Clinical Trials Group
Source: NIH/NIAID
Role: Investigator (Protocol PI) ACTG 339 (15% effort)
Investigator (Site PI) ACTG 310 (PI: J. Lambert)
Dates: 1996-1997
Direct Funds: \$621,256

Title: Pediatric AIDS Clinical Trials Group
Source: NIH/NIAID
Role: Investigator (Site PI) ACTG 310 (10% effort)
Investigator (Site PI) ACTG 382 (PI: A. Ruff)
Dates: 1997-1998
Direct Funds: \$639,895

Title: Timing of Insult in Cerebral Palsy: Inference from Cytokine Trajectories in Newborns
Source: United Cerebral Palsy Foundation
Role: Principal Investigator (20% effort)
Dates: 2000-2002
Direct Funds: \$100,000

Title: Future Screening Test for Cerebral Palsy
Source: Thomas Wilson Sanitarium
Role: Principal Investigator
Dates: 2001-2002
Direct Funds: \$12,800

Title: "Pilot study for detection and management (with dose ranging) of intracranial vasospasm associated with bacterial meningitis
Source: Clinical Research Feasibility Funds (CReFF), MCW
Role: Principal Investigator (no salary support)
Dates: 2007-2009
Direct Funds: \$20,000

Title: Virus clearance from the central nervous system
Source: NIAID, NIH
Role: Principal Investigator of multiple PI (4 site) grant.
Dates: 2011-2016
Direct funds: \$1,086,544 to this institution.

Title: Hydrogen sulfide intoxication by infection
Source: Advancing Healthier Wisconsin
Role: Principal Investigator
Dates: 2013
Direct funds: \$5,000

Title: Hydrogen sulfide intoxication in brain abscesses
Source: Children's Research Institute
Role: Principal Investigator
Dates: 2014
Direct funds: \$50,000

Non-Peer Reviewed:

Title: Glycolipid receptors for enteric viruses
Source: Glycomed Corporation
Role: Lead Investigator (80% effort) (PI: R.H. Yolken)
Dates: 1988-1990
Direct Funds: \$23,448

Title: Synthetic polymers as therapy for rotavirus gastroenteritis
Source: GelTex Pharmaceuticals
Role: Principal Investigator (10% effort)
Dates: 1994-1996
Direct Funds: \$79,671

Title: Antibiotic Resistance Group
Source: Zeneca Pharmaceuticals/Bristol-Myers Squibb
Role: Principal Investigator (10% effort)
Dates: 1996-1998
Direct Funds: \$87,000

Title: CNS Infections
Source: BioMarin Pharmaceuticals
Role: Principal Investigator
Dates: 2007, open
Direct funds: \$50,000

Title: Rabies Fund
Source: Children's Hospital Research Foundation
Role: Principal Investigator
Dates: 2008
Direct funds: \$4000

Title: Rabies Fund
Source: Zach Jones Memorial Foundation
Role: Principal Investigator
Dates: 2009-2013
Direct funds: \$128,463

Title: CNS Infections
Source: Becky Werner Foundation
Role: Principal Investigator
Dates: 2009-2014
Direct funds: \$70,000

Title: NMR for Discriminating ADEM from Infection
Source: Children's Specialty Group
Role: Principal Investigator
Dates: 2015
Direct funds: \$26,745

Contracts:

Title: Phase II study of the safety, tolerance, pharmacokinetics, and anti-viral effect of delavirdine mesylate BID in combination with nucleoside reverse transcriptase inhibitors, in HIV-1 infected neonates, infants, and children
Source: Pharmacia-Upjohn
Role: Site Investigator (10% effort)
Dates: 1998
Direct Funds: \$32,350

Title: Changing antimicrobials prescribing to reduce antimicrobial resistance in hospitalized patients (Study of antibiotic cycling in MICU and PICU)
Source: Centers for Disease Control and Prevention
Role: Principal Investigator (15% effort)

Dates: 1999-2001
Direct Funds: \$121,302

Grant Review:

Inventions, Patents, Copyrights:

U.S. Patent 5,192,551 *A neutral glycolipid as an adsorbent for enteric viral pathogens*
U.S. Patent 5,891,862 *Polyvalent polymers for the treatment of rotavirus infection*
Preliminary patent filed *Methods of treating meningitis using tetrahydrobiopterin and L-arginine*

Industry Consultant:

3/1/96 Infectious Disease Meeting, GelTex Pharmaceuticals, March 1, 1996
8/1/98 Advisory Board Meeting, Viropharma Incorporated, August 1, 1998

Invited Lectures/Workshops/Presentations/Site Visits:

International:

“Rotaviruses bind specifically to the neutral glycolipid asialo-GM1”, U.S. and Japanese Viral Diseases Panels, U.S.-Japan Cooperative Medical Science Program, Annapolis, M.D., August 21-23, 1989.

“Treatable Viral Infections in Pediatrics and Neonatology”; “Resistance to Antibiotics, with Special Emphasis on Penicillin-resistant Pneumococci”; “Treatment of Community-acquired Pneumonia, Osteoarticular Infections and Urinary Tract Infections”, IV Jornadas Franco-Argentinas de Medicina y Cirugia, Hospital Frances, Buenos Aires, Argentina, September 1-2, 1997.

“Inflammation and Cerebral Palsy”, 18th European Congress on Perinatal Medicine, Oslo, Norway, June 22, 2002 (Plenary Session).

“Overview of infectious diseases and cerebral palsy in developed and underdeveloped countries”, International Conference on Women and Infectious Diseases: From Science to Action”, Atlanta, Georgia, February 28, 2004.

“Survival from rabies through improvised use of a therapeutic coma”. XVI International Conference on Rabies in the Americas, Ottawa, Ontario, Canada, October 20, 2005.

“Rabies Management” XLII Congress of the Brazilian Society of Tropical Medicine, Teresina, Piaui, Brazil, March 8, 2006

“Human Rabies—Post-exposure prophylaxis and treatment in the 21st century.” International Congress of Pediatrics, Athens, Greece, August 25-30, 2007

“Rabies—Pathogenesis and new treatments.” International Congress of Pediatrics, Athens, Greece, August 25-30, 2007

“Management of human rabies” National Training Workshop on Rabies Post-exposure Prophylaxis, Chinese Centers for Disease Control and Prevention, Chengdu, Sichuan, Peoples Republic of China, November 25-26, 2007

“Current therapeutic approach to people with rabies” Meet-the-Professor, 48th Annual Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) and the Infectious Diseases Society of America (IDSA) 46th Annual Meeting, Washington, DC, October 25-28, 2008

“Antibody kinetics in the treatment of human rabies” Faculty of Medical Sciences, University of Pernambuco, Recife, Brazil, February 9, 2009

“Milwaukee Protocol to treat human rabies” Faculty of Medical Sciences, University of Pernambuco, Recife, Brazil, February 9, 2009

“Rabies pathophysiology”(Spanish) 9th Colombian Congress on Infectious Diseases, Cali, Colombia, May 26-31, 2009

“Clinical manifestations and diagnosis of human rabies”(Spanish) 9th Colombian Congress on Infectious Diseases, Cali, Colombia, May 26-31, 2009

“Treatment of human rabies” 2010 National Conference on Rabies Prevention and Control, Beijing, China, September 17-18, 2010

“Rabies Update and Management Advances”, Latin America Society for Pediatric Infectious Diseases, Punta Cana, Dominican Republic, May 25-28, 2011

“Global Vaccine Update-2013” [in Spanish], 62nd National Congress of the Spanish Pediatric Association, Sevilla, Spain, June 7, 2013

“Update on Rabies Therapy (the Milwaukee Protocol)” [in Spanish], Hospital Gustavo Fricke, Viña del Mar, Chile, January 9, 2013

“Treatment of Human Rabies” [in Spanish], Institute for Public Health-Chile, Santiago, Chile, January 10, 2013

National:

“Is Necrotizing Enterocolitis an Infectious Disease”, Grand Rounds, Children’s Hospital of the King’s Daughters, Norfolk, Virginia, February 11, 1993.

“Approach to the Child with Diarrhea”; “Antibiotic Therapy for Otitis Media and Sinusitis”; “Optimizing Outpatient Parental Therapy”, Pediatric Infectious Disease Seminar, Hilton Head, South Carolina, June 20-24, 1995.

“Spastic CP and PVL: New Findings/New Work-Up”, Plenary Lecture, Infectious Diseases Society for Obstetrics and Gynecology, Incline Village, Nevada, August 3, 2000.

“Recovery of a patient from rabies”, University of Chicago Medicine-Pediatrics Speaker Series, March 17, 2005.

“Batter up: Surviving Rabies”, Symposium Lecture, Society for Healthcare Epidemiology of America, Los Angeles, California, April 11, 2005

“Rabies Management: A case report (or three)”. Pediatric Grand Rounds/Translational Research Series, Children’s Hospital of Wisconsin, January 6, 2006

“Rabies Management: A case report (or three)”. Infectious Diseases Conference, Brown University, Miriam Hospital, Providence, February 22, 2006

“Rabies Management: A case report (or three)”. Pediatric Grand Rounds, Johns Hopkins Hospital, Baltimore, March 1, 2006

“Rabies in Children” Pediatric Grand Rounds, University of Iowa, Iowa City, March 24, 2006

“Treatment of rabies”, Pediatric Residency Conference, Children’s Hospital of Oakland, Oakland, CA, November 22, 2006

“Rabies”, Viral & Rickettsial Disease Laboratory, Department of Health Services, State of California, Richmond, California, November 28, 2006

“Treatment of rabies” Pediatric Grand Rounds, Maimonides Infants & Children’s Hospital of Brooklyn (Mt. Sinai School of Medicine), March 6, 2007

“Update on human rabies therapy”, World Rabies Day, Centers for Disease Control and Prevention, Atlanta, September 7, 2007

“Successfully treating human rabies”, Pediatric Grand Rounds, Children’s Hospital at Montefiori (Albert Einstein College of Medicine) Bronx, NY , January 5, 2010

“Treatment of rabies”, American Society of Tropical Medicine and Hygiene, Atlanta, GA, November 9, 2012

“Treatment of human rabies”, Centers for Disease Control and Prevention, May 9, 2013

“Rabies Therapy”, Pediatric Grand Rounds, Nemours Children’s Hospital, Orlando, FL, November 19, 2013

“Treatment of rabies – the first 10 years”; Russell J. Blattner Lectureship, Texas Children’s Hospital, Houston, TX, April 4, 2014

“Treatment of rabies – the first 10 years”, The 22nd Annual Fred J. Heldrich, MD Pediatric Breakfast and Lecture, Saint Agnes Hospital (Johns Hopkins), Baltimore, MD, May 2, 2014

Regional:

“Vector-borne Infections”, Annual Meeting, American Academy of Pediatrics, Maryland Chapter, St. Michael’s, October 19, 1997.

“Cerebral Palsy: Current Concepts Regarding Etiology”, 63rd Annual Meeting, Wisconsin Section/American College of Obstetricians and Gynecologists, July 23, 2004.

“Recovery from rabies”, Winnebago County Medical Society, March 10, 2005.

“Survival from Rabies”, Case Management Society of America, Milwaukee Chapter, Country Springs Hotel, Waukesha, Wisconsin, October 4, 2005

“Surviving Rabies”, Association for Professionals in Infection Control, Southeast Wisconsin Chapter, Froedtert Hospital, Milwaukee, November 3, 2005

“Therapies for rabies: Supportive *and* specific”, Clinical Laboratory Managers’ Association, Radisson Hotel, Peewaukee, September 28, 2006

Local:

“A 14 Month Old Child with Reticulonodular Pulmonary Infiltrates”, Clinical-Pathological Conference, Johns Hopkins Hospital, Baltimore, Maryland, January 8, 1992.

“Update on Rotavirus Infections”, Grand Rounds, Department of Pediatrics, Johns Hopkins Bayview Medical Center, Baltimore, Maryland, January 31, 1995.

“Encephalitis”, Grand Rounds, Department of Pediatrics, St. Agnes Hospital, Baltimore, Maryland, September 8, 1995.

“A 12 year old Native American/Caucasian Boy with Fever, Headache, and Jaundice”, Clinical-Pathological Conference, Johns Hopkins Hospital, Baltimore, Maryland, October 18, 1995.

“Antibiotic Resistance In Sickle Cell Disease”, Hematology Grand Rounds, Johns Hopkins Hospital, Baltimore, Maryland, October 28, 1996.

“Antibiotic Update”, Urology Grand Rounds, Johns Hopkins Hospital, Baltimore, Maryland, October 21, 1996.

“Receptor-based Therapy of Rotavirus Infections”, Grand Rounds, Department of Pediatrics, Johns Hopkins Hospital, February 4, 1998.

“Antibiotic Resistance and Surgical Prophylaxis”, Urology Grand Rounds, Johns Hopkins Hospital, Baltimore, Maryland, September 21, 2000.

“Is Cerebral Palsy an Infectious Disease?”, Departmental Academic Program, Pediatrics, Johns Hopkins Medical and Surgical Association, June 6, 2001.

“Aspergillus Infections in Neutropenic Oncology Patients”, Oncology Grand Rounds, Johns Hopkins Hospital, Baltimore, Maryland, June 14, 2002.

“Antimicrobial Resistance: Populations vs. Individuals”, PICU Research Conference, Children’s Hospital of Wisconsin, February 3, 2005

“Probiotics to Minimize Resistant Infections in Hospitals”, Children’s Research Institute Academic Conference, Children’s Hospital of Wisconsin, May 19, 2005

“Probiotics in Neonates”, Combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, Children’s Hospital of Wisconsin and MCW Neonatology Speaker Series, Milwaukee, September 27, 2005

“Rabies Management A Case report (or Three)” Pediatric Grand Rounds, Children’s Hospital of Wisconsin, January 6, 2006

“10-month Girl with Bloody Diarrhea after Open-heart Surgery” [Pneumatosis intestinalis, chloral hydrate, sorbitol] combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, Children’s Hospital of Wisconsin, February 27, 2007

“Cerebral artery spasm in rabies and bacterial meningitis”, Children’s Research Institute Academic Conference, Children’s Hospital of Wisconsin, March 23, 2007

“A 4-year old with pitchfork injury to his knee” [Myceliophthora thermophila] combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, November 22, 2007

“Attenuated (Live) Virus Vaccine Infections in Immunocompromised Patients”, combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, Children’s Hospital of Wisconsin, April 5, 2007

“Probiotics”, Nutrition Conference, Children’s Hospital of Wisconsin, September 19, 2007

“NSAIDs and Complicated Bacterial Pneumonia” combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, Children’s Hospital of Wisconsin, September 25, 2007

“Metabolomics of human rabies” Children’s Research Institute Academic Conference, Children’s Hospital of Wisconsin, June 27, 2008

“A 5-month Hispanic male with seizures” [HHV-6] Combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, February 24, 2009

“An 11-month old with refusal to sit” [discitis] Combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, March 24, 2009

“Milwaukee Protocol for treating human rabies”. Infectious Disease Research Conference, Medical College of Wisconsin/Froedtert Hospital, December 3, 2009

“A 10 day old term neonate with sepsis” [enterovirus myocarditis] Combined Milwaukee Area ID Interest Rounds, January 26, 2010

“A 17 year old with knee pain and hypotension” [Group A streptococcal osteomyelitis] Combined Milwaukee Area ID Interest Rounds, September 28, 2010

“Milwaukee protocol for human rabies and new perspectives for other CNS diseases”, Pediatric Grand Rounds, Children’s Hospital of Wisconsin, February 18, 2011

“Microbial Gas Warfare” [S. anginosus group meningitis] Combined Milwaukee Area ID Interest Rounds, October 25, 2011

“CNS infections” Pediatric Neurology Fellowship Lecture Series, February 17, 2012

“An 11 year old with obtundation” [West Nile Virus encephalitis] Combined Milwaukee Area ID Interest Rounds, January 22, 2013

“25 week gestation male born with a generalized rash” [Listeria monocytogenes] Combined Milwaukee Area ID Interest Rounds, March 25, 2014.

Medical College of Wisconsin Committees: N/A

Children’s Hospital of Wisconsin Committees:

2004 – Present	Member, Infection Control Committee Children’s Hospital of Wisconsin
2004 – Present	Member, Pharmacy and Therapeutics Committee Children’s Hospital of Wisconsin
2010 - 2012	Whole Genome Sequencing Committee Children’s Hospital of Wisconsin

John’s Hopkins University School of Medicine Committees:

1995 – 1996	Search Committee, Laboratory Director, Microbiology Laboratories, Department of Pathology Johns Hopkins University School of Medicine
1996	Pharmacy Usage Working Group, Clinical Practices Utilization Group, Johns Hopkins Medicine (combined University/Hospital LLC)

- 1996 Ad Hoc Committee on Faculty Compensation,
Department of Pediatrics, Johns Hopkins School of Medicine
- 1996 – 1998 Children’s Center Computer Committee,
Department of Pediatrics, Johns Hopkins School of Medicine

Johns Hopkins Hospital Committees:

- 1989 – 1991 Intern Selection Committee
Department of Pediatrics
The Johns Hopkins Hospital
- 1994 – 1998 Infection Control Committee
The Johns Hopkins Hospital
- 1994 – 1998 RSV Joint SubCommittee
Department of Pediatrics/Infection Control Committee
The Johns Hopkins Hospital
- 1994 – 1998 VRE Joint Subcommittee
Infection Control/Pharmacy & Therapeutics Committees
The Johns Hopkins Hospital
- 1994 – 1998 Pharmacy and Therapeutics Committee
2002 - 2004 The John’s Hopkins Hospital
- 1994 – 1998 Antibiotic Subcommittee
Pharmacy and Therapeutics Committee
The John’s Hopkins Hospital
2002 – 2004 Chair, Antibiotic Subcommittee
- 1996 Member, Ad Hoc Committee for Documentation of
Evaluation and Management Services,
Department of Pediatrics, The Johns Hopkins Hospital

Medical College of Wisconsin Teaching Activities:

- 2005 to present Clinical correlation—Rabies , Microbiology course

Medical Student Education, Resident, and Fellow Education:

- 2004-Present Consultation Service, Pediatric Infectious Diseases, Medical College of Wisconsin, Attending Physician. Training of pediatric housestaff and students on elective.
- 2004-Present Infectious Diseases Interest Rounds (weekly city-wide infectious diseases conference), Periodic speaker.
- 2006-Present Pediatric Residency (PL-2) Journal Club

Faculty Development/Continuing Medical Education:

- 2/18/05 Faculty Academic Conference, Department of Pediatrics, Medical College of Wisconsin.
- 2010 Reviewer, Children's Research Institute Pilot Innovative Research Awards

Community/Lay Public: none

Johns Hopkins Teaching Activities:

Classroom Instruction:

- 1991-1998 Pediatric Noon Lecture Series: Rotating Topics. Lectures to Johns Hopkins Pediatric Housestaff and Medical Students at The Johns Hopkins Hospital, Baltimore, MD.
- 1994-1998 Basic Pediatric Clerkship Lecture Series: "Bacterial Meningitis", Quarterly lecture to Medical Students
- 1994-1998 Pediatric Subspecialty Lecture Series, St. Agnes Hospital, Baltimore, Maryland: Rotating Topics. Monthly lectures to Johns Hopkins Pediatric Housestaff and Medical Students on rotation at community hospital.
- 2001, 2004 Rational Therapeutics Course. Rational Antibiotic Use. Lecture to 4th year Medical Students, Johns Hopkins School of Medicine.

Clinical Instruction:

- 1998-2004 Joint Pediatric – Medicine Infectious Disease Case Conference, The Johns Hopkins Hospital. Regular discussant and facilitator at weekly conference for faculty, fellows, laboratory personnel, and medical students.
- 1990-2004 Consultation Service, Pediatric Infectious Diseases, The Johns Hopkins Hospital, Attending Physician. Training of clinical fellows, pediatric housestaff, and students on elective.

- 1991-1996 General Ward Attending, Department of Pediatrics, The Johns Hopkins Hospital. Supervision and education of pediatric housestaff and students enrolled in the basic pediatric clerkship.
- 1991-2004 Morbidity and Mortality Conferences, Department of Pediatrics, The Johns Hopkins Hospital. Regular discussant and participant at biweekly conference for pediatric faculty, fellows, housestaff and medical students.
- 1991-2004 Case Management Conferences, Department of Pediatrics, The Johns Hopkins Hospital. Regular discussant and participant at weekly conference for pediatric faculty, fellows, housestaff, and medical students.
- 1994-1998 Elective in Pediatric Infectious Diseases, Johns Hopkins School of Medicine. Preceptor for residents, medical students and residents in pharmacology. Clinical rotations and research electives.
- 1994-1999 Plate Rounds, Microbiology Laboratories, The Johns Hopkins Hospital. Weekly discussant and regular participant at daily conference for Pediatric Infectious Disease and Infectious Disease fellows, residents, and students on elective with either subspecialty.

MCW Students, Faculty, Residents or Fellows Mentored:

Fellowship committee:

1. **Amanda Brandow, DO, (Candidate, MPH degree)**, Fellow in Pediatric Hematology-Oncology, 2006-2008
Present position: “Assistant Professor, Department of Pediatrics, Medical College of Wisconsin

Johns Hopkins Students, Faculty, Residents or Fellows Mentored:

Director, Pediatric Infectious Diseases Fellowship Program, 1994 to 2000

Fellowship advisees – last updated, 2008:

Fellowship advisees:

1. **Jasjit Singh, MD**, Fellow in Pediatric Infectious Disease, 1993-1995
Present Position: Assistant Professor, Department of Pediatrics, University of California at Irvine;
Director, Infection Control Children's Hospital of Orange County
Awards: Bauernschmidt Fellowship, Department of Pediatrics, The Johns Hopkins Hospital
2. **Ann W. Funkhouser, MD, MS**, Fellow in Pediatric Infectious Disease, 1994-1995
Present Position: Supervisory Medical Officer, Office of Surveillance and Epidemiology/DP II, Food & Drug Administration, Washington, D.C.
3. **Syema Muzaffar, MD, MPH**. Fellow in Pediatric Infectious Disease, 1994-1996
Present Position: Private practice
4. **Edwin J. Asturias, MD**, Fellow in Pediatric Infectious Disease, 1995-1998

Present Position: Research Scientist, Johns Hopkins Bloomberg School of Public Health; Researcher, Center for Health Studies, University del Valle in Guatemala; Chief of Infectious Diseases, National Unit of Pediatric Oncology

Awards: Bauernschmidt Fellowship, Dept. of Pediatrics, The Johns Hopkins Hospital; Harriet Lane Award, Dept. of Pediatrics, The Johns Hopkins Hospital

5. **Fernando P. Polack, MD**, Fellow in Pediatric Infectious Disease, 1996 to 1999

Present Position: Associate Professor, Dept. of Molecular Microbiology & Immunology, Johns Hopkins Bloomberg School of Public Health

Awards: Pasteur Merieux Connaught Laboratories Fellowship in Pediatrics, Infectious Diseases Society of America

6. **William Moss, MD, MPH**, Fellow in Pediatric Infectious Disease, 1996 to 1999

Present Position: Associate Professor, Dept. of Epidemiology, Johns Hopkins School of Public Health

Awards: Wyeth Lederle Vaccines and Pediatrics Young Investigator's Award for Vaccine Development, Infectious Diseases Society of America; The Gustave J. Martin Innovative Research Fund Fellow, Johns Hopkins University Bloomberg School of Public Health Faculty Innovation Fund

7. **Ravit Boger, MD**, Fellow in Pediatric Infectious Disease, 1998 to 2001

Present Position: Assistant Professor, Department of Pediatrics, The Johns Hopkins University

Awards: Bauernschmidt Fellowship, Department of Pediatrics, The Johns Hopkins Hospital; Clinician-Scientist Award, Johns Hopkins University

8. **Charles B. Foster, MD**, Fellow in Pediatric Infectious Disease, 1999 to 2002

Present Position: Staff Physician, Center for Pediatric Infectious Diseases, Pediatric Institute, Cleveland Clinic; Principle Investigator, Department of Cancer Biology, Lerner Research Institute, Cleveland Clinic.

Awards: Children's Hospital Research Center Scholar

9. **Jana Bockova Shaw, MD**, Fellow in Pediatric Infectious Disease, 1999 to 2002

Present Position: Assistant Professor, Dept. of Pediatrics, State University of New York, Syracuse, NY.

Programmatic Developments:

Rabies websites with patient registry and protocol (living document): www.mcw.edu or www.chw.org

Rabies Treatment Protocol, version 1.2

Rabies Treatment Protocol, version 2.1

Rabies Treatment Protocol, version 3.1

Rabies Treatment Protocol, version 4.1

Continuing Medical Education:

Pediatric Infectious Disease Case Management Conference, 1994 to 2000. CME certified for Pediatrics. Organizer of weekly conference attended by Pediatric Infectious Disease faculty, fellows and students, infection control personnel of 2 hospitals, pharmacists, International Health post-doctoral students, and faculty at the School of Hygiene and Public Health.

‘Trends in Pediatrics Course, The Johns Hopkins Hospital, Baltimore MD, CME certified for Pediatrics and Family Practice. 1994-98, Session chair and lecturer, Program on Infectious Diseases. 2000-01 Lecturer

HIV Interest Group, Deans’ Initiative, School of Medicine and School of Hygiene & Public Health, Johns Hopkins Medical Institutions, 1995-1997 CME certified for Pediatrics and Medicine. Co-chair (with Joseph Margolick, M.D.) of weekly research lecture series spanning clinical care, epidemiology, statistics, psychology and psychiatry, pharmacology, nutrition, and the laboratory sciences. Audience of faculty in both schools, clinical fellows, post-doctoral and graduate students.

Pediatric Infectious Disease Seminar, Hilton Head, SC, June 20-24, 1995. CME certified for Pediatrics and Family Practice. Lecturer

‘Progress in Pediatrics ‘96’ Course, The Johns Hopkins Hospital, Baltimore MD, November 1, 1996, CME certified for Pediatrics and Family Practice. Lecturer

‘Pediatric Allergy and Immunology for the Practitioner’ Course, The Johns Hopkins Hospital, Baltimore MD, May 8, 1997 CME certified for Pediatrics and Family Practice. Lecturer

‘Pediatrics for the Practitioner Update’97’ Course, The Johns Hopkins Hospital, Baltimore MD, September 19, 1997 CME certified for Pediatrics and Family Practice. Lecturer

American Academy of Pediatrics, Maryland Chapter, Annual Meeting, St. Michael's, MD, October 19, 1997. CME certified for Pediatrics. Moderator, Infectious Disease Section, and lecturer

Wisconsin Section/ American College of Obstetricians and Gynecologists, 63rd Annual Meeting, Wisconsin Dells, July 23, 2004. *Cerebral palsy: current concepts regarding etiology*

Editors’ Choice 2005 Pediatric Conference, Pfister Hotel, Milwaukee, June 16, 2005. *Rabies Management*

“Recovery from rabies”, Winnebago County Medical Society, March 10, 2005.

“Antimicrobial resistance:Populations vs. individuals”, Pediatric Critical Care Research Conference, February 3, 2005

“Probiotics to Minimize Resistant Infections in Hospitals”, Children’s Research Institute Academic Conference, Children’s Hospital of Wisconsin, May 19, 2005

“Probiotics in Neonates”, Milwaukee Infectious Diseases Interest Rounds/MCW Neonatology Speaker Series joint conference, Milwaukee, September 27, 2005

“Survival from Rabies”, Case Management Society of America, Milwaukee Chapter, Country Springs Hotel, Waukesha, Wisconsin, October 4, 2005

“Surviving Rabies”, Association for Professionals in Infection Control, Southeast Wisconsin Chapter, Froedtert Hospital, Milwaukee, November 3, 2005

“Rabies Management A Case report (or Three)” Pediatric Grand Rounds, Children’s Hospital of Wisconsin, January 6, 2006

“Therapies for rabies: Supportive *and* specific”, Clinical Laboratory Managers’ Association, Radisson Hotel, Peewaukee, September 28, 2006

“10-month Girl with Bloody Diarrhea after Open-heart Surgery” combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, Children’s Hospital of Wisconsin, February 27, 2007

“Cerebral artery spasm in rabies and bacterial meningitis”, Children’s Research Institute Academic Conference, Children’s Hospital of Wisconsin, March 23, 2007

“Attenuated (Live) Virus Vaccine Infections in Immunocompromised Patients”, combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, April 5, 2007

“Probiotics”, Nutrition Conference, Children’s Hospital of Wisconsin, September 19, 2007

“NSAIDs and Complicated Bacterial Pneumonia” combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, Children’s Hospital of Wisconsin, September 25, 2007

“A 4-year old with pitchfork injury to his knee” combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, November 22, 2007

“Metabolomics of human rabies” Children’s Research Institute Academic Conference, Children’s Hospital of Wisconsin, June 27, 2008

“Current therapeutic approach to people with rabies” Meet-the-Professor, 48th Annual Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) and the Infectious Diseases Society of America (IDSA) 46th Annual Meeting, Washington, DC, October 25-28, 2008

“A 5-month Hispanic male with seizures” [HHV-6] Combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, February 24, 2009

“An 11-month old with refusal to sit” [discitis] Combined Milwaukee Area ID Interest Rounds/CHW Pediatric Residency Conference, March 24, 2009

“Milwaukee Protocol for treating human rabies”. Infectious Disease Research Conference, Medical College of Wisconsin/Froedtert Hospital, December 3, 2009

“A 10 day old term neonate with sepsis” [enterovirus myocarditis] Combined Milwaukee Area ID Interest Rounds, January 26, 2010

“A 17 year old with knee pain and hypotension” [Group A streptococcal osteomyelitis] Combined Milwaukee Area ID Interest Rounds, September 28, 2010

“Milwaukee protocol for human rabies and new perspectives for other CNS diseases”, Pediatric Grand Rounds, Children’s Hospital of Wisconsin, February 18, 2011

“Microbial Gas Warfare” [S. anginosus group meningitis] Combined Milwaukee Area ID Interest Rounds, October 25, 2011

“An 11 year old with obtundation” [West Nile Virus encephalitis] Combined Milwaukee Area ID Interest Rounds, January 22, 2013

“25 week gestation male born with a generalized rash” [Listeria monocytogenes] Combined Milwaukee Area ID Interest Rounds, March 25, 2014.

BIBLIOGRAPHY

Refereed Journal Publications/Original Papers:

1. Yolken, R. H., **WILLOUGHBY, R.**, Wee, S.B., Miskuff R., and Vonderfecht S.: Sialic acid glycoproteins inhibit in vitro and in vivo replication of rotaviruses. J Clin Invest 79:148-154, 1987.
2. **WILLOUGHBY, R.E.**, Wee, S.B., Yolken, R.H.: Non-Group A rotavirus infection associated with severe gastroenteritis in a bone marrow transplant patient (case report). Pediatr Infect Dis J 7: 133-135, 1988.
3. Schwarz, K.B., Moore, T.J., **WILLOUGHBY, R.E.**, Yolken, R.H.: Hep-G2 cells support rotavirus (RV) infection. Hepatology 10[4]:646, 1989.
4. **WILLOUGHBY, R.E.**, and Yolken, R.: SA11 Rotavirus is specifically inhibited by an acetylated sialic acid. J Infect Dis 161:116 –119, 1990.
5. **WILLOUGHBY, R.E.**, Yolken, R.H., and Schnaar, R.L.: Rotaviruses specifically bind to the neutral glycosphingolipid asialo-GM1. J Virol 64: 4830-4835, 1990.
6. Schwarz, K.B., Moore, T.J., **WILLOUGHBY, R.E.**, Siok-Bi, W., Vonderfecht, S.L., and Yolken, R.H.: Growth of Group A rotaviruses in a human liver cell line. Hepatology 12: 638-643, 1991.
7. Wilde, J., Yolken, R., **WILLOUGHBY, R.**, Eiden, J.: Improved detection of rotavirus shedding by polymerase chain-reaction. Lancet 337:323-326, 1991.
8. Srnka, C.A., Tiemeyer, M., Gilbert, J.H., Moreland, M., Schweingruber, H., deLappe, B.W., James, P.G., Gand, T., **WILLOUGHBY, R.E.**, Yolken, R.H., Nashed, M.A., Abbas, S.A.,

- Laine, R.A.: Cell Surface Ligands for Rotavirus: Mouse Intestinal Glycolipids and Synthetic Carbohydrate Analogs. Virology 190: 794-805, 1992.
9. Lindsay, D.A., Vonderfecht, S.S., **WILLOUGHBY, R.**, Betenbaugh, M.J., and Eiden, J.J.: Identification and expression of the outer capsid protein (VP4) of the IDIR strain of group B rotavirus (GBR). Virology 194: 724-733, 1993.
 10. **WILLOUGHBY, R.E.**: Rotaviruses preferentially bind O-linked sialylglycoconjugates and sialomucins. Glycobiology 5: 437-445, 1993.
 11. Sicherer, S.H., Asturias, E.J., Winkelstein, J.A., Dick, J.D., **WILLOUGHBY, R.E.**: Francisella philomiragia sepsis in chronic granulomatous disease. (case report) Pediatr Infect Dis J 16: 420 – 422, 1997.
 12. Polack, F.P., Harrington, S.M., Winkelstein, J.A., Mertz, W.G., **WILLOUGHBY, R.E.**: Recurrent Francisella philomiragia sepsis in chronic granulomatous disease. (case report) Pediatr Infect Dis J 17: 442-443, 1998.
 13. **WILLOUGHBY, R.E.**, and Polack, F.P.: Meningitis in children. Contemporary Pediatrics 15: 49-70, 1998.
 14. Reprinted subsequently in a sister publication: What's new in meningitis management. Patient Care 33: 237-254
 15. Polack, F.P., Flayhart, D.C., Zahurak, M.L., Dick, J.D., **WILLOUGHBY, R.E.**: Colonization by Streptococcus pneumoniae in human immunodeficiency virus-infected children. (Case-control study) Pediatr Infect Dis J 19: 608-12, 2000.
 16. Hughes, W.T., Shenep, J.L., Rodman, J.H., Fridland, A., **WILLOUGHBY, R.**, Blanchard, S., Purdue, L., Coakley, D.F., Cundy, K.C., Culnane, M., Zimmer, B., Burchett, S., Read, J.S., and the Pediatric AIDS Clinical Trials Group: Single dose pharmacokinetics and safety of the oral antiviral compound adefovir dipivoxil (bis-POM PMEAs) in children with HIV-1 infection. Antimicrobial Agents & Chemotherapy 44: 1041-1046, 2000.
 17. Arav-Boger, R., Baggett, H.C., Spevak, P.J., and **WILLOUGHBY, R.E.**: Leukocytosis caused by prostaglandin E1 in neonates. (Case-control study) J Pediatrics 138: 263-265, 2000.
 18. Lesko, S., O'Brien, K.L., Schwartz, B., Vezina, R., Mitchell, A.A.: Invasive Group A streptococcal infection and nonsteroidal antiinflammatory drug use among children with primary varicella. (**Network collaborator: REW, Johns Hopkins**) Pediatrics 107:1108-1115, 2001.
 19. Arav-Boger, R., **WILLOUGHBY, R.E.**, Pass, R.F., Zong, J.C., Jang, W.J., Hayward, G.S.: Polymorphisms of the cytomegalovirus-encoded TNF and -chemokine receptors in congenital CMV disease (case-control study). J Infect Dis 186:1057-1064, 2002.

20. Moss, W.J., Beers, M.C., Johnson, E., Nichols, D.G., Perl, T.M., Dick, J.D., Veltri, M.A., and **WILLOUGHBY, R.E., JR.**: Pilot study of antibiotic cycling in a pediatric intensive care unit. Crit Care Med 2002; 30(8):1877-1882, 2002.
21. Grether, J.K., Nelson, K.B., Walsh, E., **WILLOUGHBY, R.E.**, Redline, R.W.,: Intrauterine exposure to infection and risk of cerebral palsy in very preterm infants (nested case-control study). Arch Pediatr Adolesc Med 157(1): 26-32, 2003.
22. Eschenbach D, Gravett M, **WILLOUGHBY R.** Infectious diseases, preterm delivery, and infant outcomes. Emerg Infect Dis 2004; 10(11).
23. **WILLOUGHBY R.E.**, Rotar MM, Dhonau HL, Ericksen KM, Capozzo DL, Kazmierczak JJ et al. Recovery of a patient from clinical rabies - Wisconsin, 2004. MMWR 2005; 53(50):1171-1173.
24. **WILLOUGHBY R.E., JR.**, Tieves KS, Hoffman GM, Ghanayem NS, Amlie-Lefond CM, Schwabe MJ et al. Survival after treatment of rabies with induction of coma. N Engl J Med 2005; 352(24):2508-2514.
25. **WILLOUGHBY R.E., JR.**, Hammarin AL. Prophylaxis against rabies in children exposed to bats. Pediatr Infect Dis J 2005; 24(12):1109-1110.
26. Destino L, Sutton DA, Helon AL, Havens PL, Thometz JG, **WILLOUGHBY R.E., JR.** et al. Severe osteomyelitis caused by *Myceliophthora thermophila* after a pitchfork injury. Ann Clin Microbiol Antimicrob 2006; 5:21.
27. Christensen JC, Holm BM, Lechlitner S, Howell JF, Wenger M, Roy-Burman A [...] **WILLOUGHBY R.E.**, Rupprecht, CE. Human rabies--Indiana and California, 2006. MMWR Morb Mortal Wkly Rep 2007; 56(15):361-365.
28. **WILLOUGHBY R.E.**, Roy-Burman A, Martin KW, Christensen JC, Westenkirchner DF, Fleck JD et al. Generalized cranial artery spasm in human rabies. Developments in Biologicals. 2008; 131:367-375.
29. Johnstone J, Saxinger L, McDermid R, Bagshaw S, Resch L, Lee B ...**WILLOUGHBY R.E.** et al. Human Rabies -- Alberta, Canada, 2007. MMWR 2008; 57(8):1-4
30. **WILLOUGHBY R.E., JR.**, Opladen T, Maier T, Rhead W, Schmiedel S, Hoyer J et al. Tetrahydrobiopterin deficiency in human rabies. J Inherit Metab Dis. 2008; 32:65-68.
31. Rubin J, David D, **WILLOUGHBY RE, JR.**, Rupprecht CE, Garcia C, Guarda DC et al. Applying the Milwaukee Protocol to treat canine rabies in Equatorial Guinea. Scand J Infect Dis 2009; 41(5):372-375
32. Kumar S, Chusid MJ, **WILLOUGHBY RE**, Havens PL, Kehl SC et al. Introduction of a Novel Swine-Origin Influenza A (H1N1) Virus into Milwaukee, Wisconsin in 2009. Viruses 2009; 1(1) 72-83

33. **WILLOUGHBY RE, JR.** "Early death" and the contraindication of vaccine during treatment of rabies. *Vaccine* 2009; 27(51):7173-7177.
34. **WILLOUGHBY RE, JR.** Are we getting closer to the treatment of rabies? *Future Virol* 2009; 4(6):563-570.
35. Hunter M, Johnson N, Hedderwick S, McCaughey C, Lowry K, McConville J ...**WILLOUGHBY RE**].et al. Immunovirological correlates in human rabies treated with therapeutic coma. *J Med Virol* 2010; 82(7):1255-1265.
36. Kumar S, Havens PL, Chusid MJ, **WILLOUGHBY RE, JR.**, Simpson P, Henrickson KJ. Clinical and epidemiologic characteristics of children hospitalized with 2009 pandemic H1N1 influenza A infection. *Pediatr Infect Dis J* 2010; 29(7):591-594.
37. Kumar S, Chusid MJ, **WILLOUGHBY RE**, Havens PL, Kehl SC, Ledebor NA et al. Epidemiologic Observations from Passive and Targeted Surveillance during the First Wave of the 2009 H1N1 Influenza Pandemic in Milwaukee, WI. *Viruses* 2010; 2(4):782-795.
38. Kumar S, Fan J, Melzer-Lange M, Trost J, Havens PL, Willoughby RE, et al. H1N1 Hemagglutinin-Inhibition Seroprevalence in Emergency Department Health Care Workers After the First Wave of the 2009 Influenza Pandemic. *Pediatr Emerg Care* 2011 Sep;27(9):804-7.
39. Aramburo A, Willoughby RE, Bollen AW, Glaser CA, Hsieh CJ, Davis SL, et al. Failure of the Milwaukee protocol in a child with rabies. *Clin Infect Dis* 2011 Sep;53(6):572-4.
40. Verma S, Landisch R, Quirk B, Schmainda K, Prah M, Whelan HT, et al [**WILLOUGHBY RE**] Presumed Hydrogen Sulfide-Mediated Neurotoxicity Following Streptococcus Anginosus Group Meningitis. *Pediatr Infect Dis J* 2012 Sep 25..
41. O'Sullivan A, **WILLOUGHBY RE**, Mishchuk D, Alcarraz B, Cabezas-Sanchez C, Condori RE, et al. Metabolomics of cerebrospinal fluid from humans treated for rabies. *J Proteome Res* 2013 Jan 4;12(1):481-90.
42. Caicedo Y, Paez A, Kuzmin I, Niezgodna M, Orciari LA, Yager PA, et al. [**WILLOUGHBY RE**] Virology, Immunology and Pathology of Human Rabies during Treatment. *Pediatr Infect Dis J* 2014 Nov 18.

Other Publications (as member of local, state, national, or international groups)

(****) = Principle author

43. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.** From the American Academy of Pediatrics: Policy statements--Modified recommendations for use of palivizumab for prevention of respiratory syncytial virus infections. *Pediatrics* 2009 Dec;124(6):1694-701.

44. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Policy statement--recommendations for the prevention and treatment of influenza in children, 2009 -2010. Pediatrics 2009 Oct;124(4):1216-26.
45. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.** Policy statement--Recommended childhood and adolescent immunization schedules--United States, 2010. Pediatrics 2010 Jan;125(1):195-6.
46. Rubin LG, Papsin B. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES** Cochlear implants in children: surgical site infections and prevention and treatment of acute otitis media and meningitis. Pediatrics 2010; 126(2):381-391.
47. Frankowski BL, Bocchini JA, Jr. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES** Head lice. Pediatrics 2010; 126(2):392-403.
48. Bernstein HH, Starke JR. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES** Policy statement--recommendation for mandatory influenza immunization of all health care personnel. Pediatrics 2010; 126(4):809-815.
49. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES** Policy statement--recommendations for prevention and control of influenza in children, 2010-2011. Pediatrics 2010; 126(4):816-826.
50. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES** Policy statement--Recommended childhood and adolescent immunization schedules--United States, 2010. Pediatrics 2010; 125(1):195-196.
51. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES** Recommendations for the prevention of Streptococcus pneumoniae infections in infants and children: use of 13-valent pneumococcal conjugate vaccine (PCV13) and pneumococcal polysaccharide vaccine (PPSV23). Pediatrics 2010; 126(1):186-190.
52. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.** Policy statement--recommended childhood and adolescent immunization schedules--United States, 2011. Pediatrics 2011 Feb;127(2):387-8.
53. **** **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.** Rabies-prevention policy update: new reduced-dose schedule. Pediatrics 2011 Apr;127(4):785-7.
54. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.** Recommendations for administering hepatitis A vaccine to contacts of international adoptees. Pediatrics 2011 Oct;128(4):803-4.
55. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.** Recommendations for prevention and control of influenza in children, 2011-2012. Pediatrics 2011 Oct;128(4):813-25.

56. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.**
Poliovirus. Pediatrics 2011 Oct;128(4):805-8.
57. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.**
Additional recommendations for use of tetanus toxoid, reduced-content diphtheria toxoid, and acellular pertussis vaccine (Tdap). Pediatrics 2011 Oct;128(4):809-12.
58. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.**
Meningococcal conjugate vaccines policy update: booster dose recommendations. Pediatrics 2011 Dec;128(6):1213-8.
59. **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.**
Recommended childhood and adolescent immunization schedules--United States, 2012. Pediatrics 2012 Feb;129(2):385-6.
60. **** **AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.** HPV vaccine recommendations. Pediatrics 2012 Mar;129(3):602-5.
61. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Recommended childhood and adolescent immunization schedules--United States, 2012. Pediatrics 2012 Feb;129(2):385-6.
62. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Recommendations for prevention and control of influenza in children, 2012-2013. Pediatrics 2012 Oct;130(4):780-92.
63. **** **Schutze GE, WILLOUGHBY RE, AMERICAN ACADEMY OF PEDIATRICS. COMMITTEE ON INFECTIOUS DISEASES.** Clostridium difficile infection in infants and children. Pediatrics 2013 Jan;131(1):196-200.
64. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Recommended childhood and adolescent immunization schedule--United States, 2013. Pediatrics 2013 Feb;131(2):397-8
65. Kimberlin DW, Baley J, **COMMITTEE ON INFECTIOUS DISEASES.** Guidance on management of asymptomatic neonates born to women with active genital herpes lesions. Pediatrics 2013 Feb;131(2):383-6.
66. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Recommendations for prevention and control of influenza in children, 2013-2014. Pediatrics 2013 Oct;132(4):e1089-e1104.
67. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Consumption of raw or unpasteurized milk and milk products by pregnant women and children. Pediatrics 2014 Jan;133(1):175-9.

68. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Recommended childhood and adolescent immunization schedule--United States, 2014. *Pediatrics* 2014 Feb;133(2):357-63.
69. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Updated guidance for palivizumab prophylaxis among infants and young children at increased risk of hospitalization for respiratory syncytial virus infection. *Pediatrics* 2014 Aug;134(2):415-20.
70. **AMERICAN ACADEMY OF PEDIATRICS COMMITTEE ON INFECTIOUS DISEASES.**
Updated recommendations on the use of meningococcal vaccines. *Pediatrics* 2014 Aug;134(2):400-3.

Books, Chapters and Reviews:

71. Kelly, K., and **WILLOUGHBY, R.E.:** Milk intolerance, eosinophilic enteritis, noninflammatory diarrhea in infants. In S.S. Long, C.G. Prober and L.K. Pickering (eds.) Principles and Practice of Pediatric Infectious Diseases, Churchill Livingstone, 1996.
72. **WILLOUGHBY, R.E.:** Necrotizing enteritis. In S.S. Long, C.G. Prober and L.K. Pickering (eds.) Principles and Practice of Pediatric Infectious Diseases, Churchill Livingstone, 1996.
73. **WILLOUGHBY, R.E.:** Transverse myelitis and myelopathy, neuritis and neuropathy, Guillain Barre syndrome, cerebellar ataxia. In S.S. Long, C.G. Prober and L.K. Pickering (eds.) Principles and Practice of Pediatric Infectious Diseases, Churchill Livingstone, 1996.
74. **WILLOUGHBY, R.E.:** Encephalitis, meningoencephalitis and post-infectious encephalitis. In S.S. Long, C.G. Prober and L.K. Pickering (eds.) Principles and Practice of Pediatric Infectious Diseases, Churchill Livingstone, 1996.
75. Berkowitz, I.D., Berkowitz, F.E., Newton, C., **WILLOUGHBY, R.**, and Ackerman, A.D.:. Meningitis, Infectious Encephalopathies, and Other Central Nervous System Infections. In M. Rogers and D. Nichols (eds.) Textbook of Pediatric Intensive Care, Williams and Wilkins, 1996.
76. reprinted subsequently in abridged form: In M.D. Rogers and M.A. Helfaer (eds.) Handbook of Pediatric Intensive Care, Williams and Wilkins, 1999.
77. **WILLOUGHBY, R.E.**, and Asturias, E.J.:. Postinfectious and vaccine-related encephalitis. In D. Armstrong and J. Cohen (eds.) Infectious Diseases, Mosby, Ch. 20, 1-8, 1999.
78. **WILLOUGHBY, R.E.:** Transverse myelitis and myelopathy, neuritis and neuropathy, Guillain Barre syndrome, cerebellar ataxia. In S.S. Long, C.G. Prober and L.K. Pickering (eds.) Principles and Practice of Pediatrics Infectious Diseases, 2nd edition, Churchill Livingstone, Ch. 46, 296-302, 2003.

79. **WILLOUGHBY, R.E.:** Encephalitis, meningoencephalitis, and post-infectious encephalitis. In S.S. Long, C.G. Prober, and L.K. Pickering (eds.) Principles and Practice of Pediatric Infectious Diseases, 2nd edition, Churchill Livingstone, Ch. 45, 291-296, 2003.
80. ACOG Task Force on Neonatal Encephalopathy and Cerebral Palsy – defining the pathogenesis and pathophysiology. American College of Obstetricians and Gynecologists and American Academy of Pediatrics, January, 2003 (**RODNEY E. WILLOUGHBY**, LISTED CONSULTANT).
81. Asturias, E.J., and **WILLOUGHBY, R.W.:** Postinfectious and vaccine-related encephalitis. In J. Cohen and W.G. Powderly (eds.) Infectious Diseases, Mosby, Ch 27, 307-315, 20004.
82. Rupprecht CE, **WILLOUGHBY R.,** Slate D. Current and future trends in the prevention, treatment and control of rabies. Expert Rev Anti Infect Ther 2006; 4(6):1021-1038.
83. **WILLOUGHBY R.E., JR.** Cerebellar ataxia, transverse myelitis and myelopathy, Guillain-Barré syndrome, neuritis, and neuropathy. In: Long SS, Pickering LK, Prober CG, editors. Principles and practice of pediatric infectious diseases. New York: Churchill Livingstone, 2008: 318-324.
84. **WILLOUGHBY RE, JR.** Rabies virus. In: Long SS, Pickering LK, Prober CG, editors. Principles and practice of pediatric infectious diseases. New York: Churchill Livingstone, 2008.
85. **WILLOUGHBY RE, JR.,** Long SS. Encephalitis, meningoencephalitis, acute disseminated encephalomyelitis, and acute necrotizing encephalopathy. In: Long SS, Pickering LK, Prober CG, editors. Principles and practice of pediatric infectious diseases. New York: Churchill Livingstone, 2008.
86. **WILLOUGHBY RE, JR.** Rabies. In: Kliegman RM, Stanton BF, St. Geme J, Schor N, Behrman RE, editors. Nelson Textbook of Pediatrics, 19th ed. Philadelphia: Elsevier, 2011
87. COMMITTEE ON INFECTIOUS DISEASES, AMERICAN ACADEMY OF PEDIATRICS. Red Book: 2012 Report of the Committee on Infectious Diseases (29th edition). Elk Grove Village IL, American Academy of Pediatrics Press, 2012
88. **WILLOUGHBY RE, JR.** Treatment of human rabies – the need to move beyond supportive care. Current Drug Discovery Technologies. In press 2013.

Editorials, Letters to Editor, Other:

89. **WILLOUGHBY, R.E.,:** Maternal infections are depressing. Pediatrics 110:832-833, 2002.
90. **WILLOUGHBY RE, JR.** Beware observational studies in neonatal practice. Arch Pediatr Adolesc Med 2003,157(9):934-935
91. Kliegman RM, **WILLOUGHBY RE.** Prevention of necrotizing enterocolitis with probiotics. Pediatrics 2005; 115(1):171-172

92. Hu WT, **WILLOUGHBY RE, Jr.**, Dhonau H, Mack KJ. Long-term follow-up after treatment of rabies by induction of coma. *N Engl J Med* 2007; 357(9):945-946.
93. **WILLOUGHBY RE**, Opladen T. Serum phenylalanine concentrations in patients post trauma and burn correlate to neopterin concentrations -- author reply. *J Inher Metab Dis* 2009; 32(4):588.
94. **WILLOUGHBY RE, JR.** Resistance to rabies. *Am J Trop Med Hyg* 2012 Aug;87(2):205

Non-Refereed Journal Publications/Original Papers:

95. Yolken, R., Kinney, J., Wilde, J., **WILLOUGHBY, R.**, and Eiden, J. Immunoglobulins and other modalities for the prevention and treatment of enteric viral infections. *J Clin Immunol* 10:80S-87S, 1990.
96. **WILLOUGHBY, R.E.**, and Pickering L.K.,: Necrotizing enterocolitis and infection. *Clin Perinatol* 21:307-316, 1994.
97. **WILLOUGHBY, R.E.**, and Livingstone, R.A. Approach to the HIV-infected child with diarrhea. *Semin Pediatr Infect Dis* 6:17-25, 1995.
98. Nelson, K.B., **WILLOUGHBY, R.E.**,: Infection, inflammation, and risk of cerebral palsy. *Current Opinion in Neurology* 13:133-139, 2000.
99. **WILLOUGHBY, R.E.**, and Nelson, K.B.,: Overview: infection during pregnancy and neurologic outcome in the child. *Mental Retard Dev Dis Res Rev* 8:1-2, 2002.
100. **WILLOUGHBY, R.E., JR.**, and Nelson, K.B.,: Chorioamnionitis and brain injury. *Clin Perinatol* 29:603-621, 2002.
101. **WILLOUGHBY R.E., JR.** A cure for a rabies? *Sci Am* 2007; 296(4):88-95

 Republished in compendium: *Infectious Disease: A Scientific American Reader*. 2008.
 University of Chicago Press

Published abstracts:

WILLOUGHBY, R.E., Schnaar R., Yolken, R.H. Rotaviruses and other enteric viruses specifically bind to asialo GM1 (GA1). *Pediatric Research* 25[4]:A193.

Schwarz, K.B., Moore, T.J., **WILLOUGHBY, R.E.**, Yolken, R.H. Growth of rotaviruses in a human-liver cell-line. *Pediatric Research* 25[4]:A124, 1989.

WILLOUGHBY, R.E., Hart, G., Yolken, R.,: Rotavirus VP7 determines expression of VP4-mediated hamagglutination and sialic-acid dependent replication. Pediatric Research 27[4], A187

WILLOUGHBY, R.E., Hart, G.W., Yolken, R.H.,: Simian rotaviruses recognize distinct classes of glycolipids and glycoproteins. Pediatric Research 29[4], A189, 1991.

WILLOUGHBY RE, JR., Tieves KS, Hoffman GM, Ghanayem NS, Amlie-Lefond CM, Schwabe MJ et al. Survival from rabies through improvised use of a therapeutic coma. XVI International Conference on Rabies in the Americas, Ottawa, Ontario, Canada, October 16-21, 2005 .

WILLOUGHBY R.E., Maier T, Rupprecht CE, Rhead WJ, Hyland K, Hoffmann GF et al. Biopterin deficiency in human rabies. XVII International Conference on Rabies in the Americas, Brasilia, Brazil, October 15-22, 2006

WILLOUGHBY R.E., Hayes J, Sather S, Medina B, Overholt P. Web-based rabies treatment registry with downloadable protocol [www.chw.org/rabies]. XVII International Conference on Rabies in the Americas, Brasilia, Brazil, October 15-22, 2006 .

WILLOUGHBY R.E., Roy-Burman A, Martin KW, Christensen JC, Westenkirchner DF, Glaser C et al. Human rabies includes early generalized vasospasm of cranial arteries that responds to tetrahydrobiopterin, L-arginine or nitroprusside. Towards the elimination of rabies in Eurasia (Joint OIE/WHO/EU International Conference) Paris, 27-30 May 2007 .

WILLOUGHBY R.E., Rupprecht CE. Milwaukee protocol for treatment of rabies -- first 10 cases. XVIII International Conference on Rabies in the Americas, Guanajuato, Mexico, September 29-October 5, 2007

Opladen T, Schmiedel S, **WILLOUGHBY RE, JR.**, Hoyer J, Hoffmann GF. Tetrahydrobiopterin and neurotransmitter deficiency in human patients with rabies. International conference on tetrahydrobiopterin, PKU and NOS.St.Moritz - Champf er, Switzerland.March 23-28, 2008

WILLOUGHBY R.E., Saxinger L, Rubin J, Yee AH, Hyland K, Marrie TJ et al. Metabolomics of human rabies. XIX International Conference on Rabies in the Americas, Atlanta, Georgia, September 28-October 3, 2008

David D, **WILLOUGHBY RE, JR.**, Rupprecht CE, Yakobson B, Rubin J. First case of mortality from rabies in the Republic of Equatorial Guinea. XIX International Conference on Rabies in the Americas, Atlanta, Georgia, September 28 - October 3, 2008 , 65.

Ribeiro P, das Dores Rodrigues M, do Socorro Rego M, Kotait I, **WILLOUGHBY RE, JR.**, Wada M et al. First rabies patient treated with the Brazilian rabies treatment protocol (Recife Protocol). XX International Conference on Rabies in the Americas, Quebec City, October 19-23, 2009 , 14. 2009.

WILLOUGHBY RE, JR. Update on the Milwaukee Protocol-2009. XX International Conference on Rabies in the Americas, Quebec City, October 19-23, 2009 , 14. 2009.

WILLOUGHBY RE, JR., Kotait I, David D, Drosten C, Nadin-Davis S, Fooks AR et al. Human antibody responses to dog and bat rabies with the Milwaukee Protocol. XX International Conference on Rabies in the Americas, Quebec City, October 19-23, 2009 , 14. 2009

WILLOUGHBY RE, JR. Cytokine response in human rabies. XXI International Conference on Rabies in the Americas, Guadalajara, October 17-22, 2010.

WILLOUGHBY RE, JR., CM Slupsky. Metabolomics of human rabies – 2010. XXI International Conference on Rabies in the Americas, Guadalajara, October 17-22, 2010.

Dimmock D, **WILLOUGHBY, JR R**, Leuthner S, Veith R, Gutzeit M, May T, Hambuch T, Worthey E, Jacob H, Tschannen M, North P, Bick D. Clinical whole genome sequencing: One center's experience. 2011 American College of Medical Genetics Annual Clinical Genetics Meeting

David D, **WILLOUGHBY RE, JR.**, Niezgoda M, Rupprecht CE, Rubin Y. Human rabies in Equatorial Guinea: Emergence of a new canine rabies virus clade in Africa. XXII International Conference on Rabies in the Americas, San Juan, October 16-21, 2011

Wiedeman J, Plant J, Messenger S, Glaser C, Slupsky C, **WILLOUGHBY RE**, et al. Survival from rabies without neutralizing antibody - California. XXII International Conference on Rabies in the Americas, San Juan, October 16-21, 2011

Verma S, Landisch R, Quirk B, Schmainda K, Whelan J and **WILLOUGHBY R**. Hydrogen sulfide intoxication by invasive *S. anginosus* infection. All-Investigators Gathering, Children's Environmental Health Center Core, Milwaukee, WI, May 3, 2012

Jia S, Hessner M, **WILLOUGHBY RE**. Analysis of RNA expression by blood mononuclear cells stimulated by human rabies CSF. XXIII International Conference on Rabies in the Americas, Sao Paulo, October 14-18, 2012

WILLOUGHBY RE, Halligan B, Greene A. Proteomics analysis of human rabies CSF. XXIII International Conference on Rabies in the Americas, Sao Paulo, October 14-18, 2012

Galvez S, Baque M, Contreras L, Merino C, Ahumada R, Jamett J, ...[[**WILLOUGHBY R**]]..et al. Survivor of rabies encephalitis in Chile. Rabies in the Americas XXIV, Toronto, October 27-31, 2013 . 2013.

Zeilonka J, Al-Gisawiy M, Kaul S, Schmainda K, **WILLOUGHBY R**. Hydrogen sulfide-mediated intoxication by invasive bacteria. First Redox Biology Program Meeting. Cardiovascular Redox Signaling Symposium, Medical College of Wisconsin, Milwaukee, WI, November 14, 2014 .

Abstracts not further published:

WILLOUGHBY, R.E., Kurtz, C., Marquez, M.L., Garigapati, V., Pitruzzello, R., and Neenan, T.X. Synthetic polymers rescue infants from disease in the murine rotavirus model. 35th Annual Meeting of the Infectious Diseases Society of America, September 15, 1997, A721.

*Publication of completed manuscript constrained because of legal action in a patent dispute.

WILLOUGHBY, R., Watson, D., Welliver, R., Cox, S.R., Wathen, L., Paxton, L., Freimuth, W.,: Phase I evaluation of delavirdine in HIV-1 infected pediatric patients. 39th Interscience Conference on Antimicrobial Agents and Chemotherapy, September 27, 1999.

*Delavirdine licensed to another pharmaceutical company soon after, halting work by co-authors on the manuscript.

Completed drug protocols, approved but not implemented:

WILLOUGHBY, R.E., Rojasthenien, N., and Lietman, P.,: HIVNET 022: A Phase I study to define the pharmacokinetics and safety of 9-[R-2(phosphonomethoxy)propyl]adenine (PMPA) in HIV-1 exposed newborns.

*Study, restricted to neonates because of their unique pharmacology, of 2 doses of parenteral tenofovir for the prevention of HIV-1 infection. The study was approved by HIVNET, funded, but not implemented after the manufacturer chose to concentrate exclusively on prodrug formulations in adults.

Video, Syllabi, or Other Teaching/Educational Material

Pediatric Infectious Diseases Fellowship Training Syllabus, Johns Hopkins University
Pediatric Infectious Diseases Elective Core Competency Syllabus, Johns Hopkins University

Rabies websites with patient registry and protocol (living document): www.mcw.edu/rabies or www.chw.org/rabies Versions 1.2; 2.1; 3.1; 4.1