

**University of California, San Francisco**  
**CURRICULUM VITAE**

**Name:** Andrew W Bollen, MD, DVM

**Position:** Professor of Clinical Pathology, Step 6  
Pathology  
School of Medicine

**Address:** Box 0102  
505 Parnassus Ave, Moffitt, M553  
University of California, San Francisco  
San Francisco, CA 94143  
Voice: 415-502-6605  
Fax: 415-476-7963  
Email: andrew.bollen@ucsf.edu

**EDUCATION**

1971 - 1975	Harvard College, Cambridge, MA	1975, A.B. cum laude	Biology
1976 - 1980	Univ. of CA, Davis, School of Veterinary Medicine	1980, D.V.M.	Veterinary Medicine
1980 - 1981	Univ. of CA, Davis, School of Veterinary Medicine	Resident	Veterinary Pathology
1981 - 1985	Univ. of CA, San Diego, School of Medicine	M.D.	Medicine
1985 - 1987	Univ. of CA, San Francisco	Resident	Anatomic Pathology
1987 - 1988	Univ. of CA, San Francisco	Chief Resident	Anatomic Pathology
1988 - 1990	Univ. of CA, San Francisco	Fellow	Neuropathology
1990 - 1991	Univ. of CA, San Francisco	Resident	Clinical Pathology(Lab Medicine)

**LICENSES, CERTIFICATION**

1980	Veterinarian - California license
1987	Physician & Surgeon - California license
1992	Certified, American Board of Pathology in Anatomic Pathology
1992	Certified, American Board of Pathology in Neuropathology
1993	Certified, American Board of Pathology in Clinical Pathology

**PRINCIPAL POSITIONS HELD**

1989 - 1990	Univ. of CA, San Francisco	Clinical Instructor	Surgical Pathology, Department of Pathology
1991 - 1997	Univ. of CA, San Francisco	Assistant Clinical Professor of Pathology	Department of Pathology
1997 - 1997	Univ. of CA, San Francisco	Associate Clinical Professor of Pathology	Department of Pathology
1998 - 1998	Univ. of CA, San Francisco	Co-director of Neuropathology	Department of Pathology
1999 - 1999	Univ. of CA, San Francisco	Associate Professor of Clinical Pathology and Co-director of Neuropathology/Chief of Clinical Neuropathology	
2001 - 2001	UCSF School of Medicine, San Francisco	Department of Pathology	Professor, Clinical X, Step 1. , Department of Pathology
2001 - 2010	Univ. of CA, San Francisco	Director of Neuropathology/Chief of Clinical Neuropathology	Department of Pathology
2016 - present	Univ. of CA, San Francisco	Professor, Clinical X, Step 6.	Department of Pathology

**OTHER POSITIONS HELD CONCURRENTLY**

- CONSULTING POSITIONS:

1992 - present	Neuropathology,	San Francisco General Hospital
1992 - present	Neuropathology,	Veterans Administration Medical Center, San Francisco
1996 - present	Neuropathology,	San Francisco Coroner's Office

1996 - present	Neuropathology,	University of California at Davis, School of Veterinary Medicine
1996 - 2012	Neuropathology,	California Emerging Infections Program/California Encephalitis Project
1998 - 2003	Neuropathology	Director Brain Tumor Research Tissue Core
1997 - 2010	Neuropathology,	California Pacific Medical Center
2000 - 2002	National Cancer Institute	MMHCC- Brain Tumors

#### **HONORS AND AWARDS**

1980	Phi Zeta (Honor Society of Veterinary Medicine)	UC Davis, School of Veterinary Medicine
1985	A. Baird Hastings Society,	UC San Diego School of Medicine
2001	America's Top Doctors, The Nation's Leading Medical Specialists A Castle Connolly Guide, 1 of 5 cited Neuropathologists	
2002	Listed in America's Top Doctors	
2003	Listed in America's Top Doctors	
2004	Listed in America's Top Doctors	
2005	Listed in America's Top Doctors	
2005	Listed in America's Top Doctors for Cancer, Castle Connolly	
2006	Listed in America's Top Doctors	
2006	Listed in America's Top Doctors for Cancer, Castle Connolly	
2007	Listed in America's Top Doctors	
2007	Listed in America's Top Doctors for Cancer, Castle Connolly	
2008	Listed in America's Top Doctors	

2008	Listed in America's Top Doctors for Cancer, Castle Connolly
2009	Listed in America's Top Doctors
2009	Listed in America's Top Doctors for Cancer, Castle Connolly
2010	Listed in America's Top Doctors
2010	Listed in America's Top Doctors for Cancer, Castle Connolly
2010	U.S. News and World Report, top pathologists (listed as one of 126 pathologists)
2011	Listed in America's Top Doctors
2011	U.S. News and World Report, top pathologists
2011	Listed in America's Top Doctors for Cancer, Castle Connolly
2012	Listed in America's Top Doctors
2012	U.S. News and World Report, top pathologists
2012	U.S. News and World Report, top pathologists
2012	Listed in America's Top Doctors for Cancer, Castle Connolly
2012	Listed in San Francisco Super Doctors
2013	Listed in America's Top Doctors for Cancer, Castle Connolly
2013	Listed in America's Top Doctors
2013	U.S. News and World Report, top pathologists
2014	Listed in America's Top Doctors
2014	U.S. News and World Report, top pathologists
2014	Listed in America's Top Doctors for Cancer, Castle Connolly
2015	Listed in America's Top Doctors
2015	U.S. News and World Report, top pathologists

2015	Listed in America's Top Doctors for Cancer, Castle Connolly
2016	Listed in America's Top Doctors
2016	U.S. News and World Report, top pathologists
2016	Listed in America's Top Doctors for Cancer, Castle Connolly
2017	Listed in America's Top Doctors
2017	U.S. News and World Report, top pathologists
2017	Listed in America's Top Doctors for Cancer, Castle Connolly
2018	Listed in America's Top Doctors
2018	U.S. News and World Report, top pathologists
2018	Listed in America's Top Doctors for Cancer, Castle Connolly

### **KEYWORDS/AREAS OF INTEREST**

Brain tumors, diagnosis, classification, cancer cytogenetics, comparative genomics by hybridization, biomarkers, immunohistochemistry, glioma, astrocytoma, oligodendroglioma, ependymoma, meningioma, genomics, epigenetics, CNS imaging techniques, neurotoxicity, epilepsy, vascular malformations, AVM, CNS infections, encephalitis, ameba infections, rabies, zoonotic disease, neuromuscular disease, myopathies, animal model systems of CNS neoplasms, veterinary neuropathology

### **CLINICAL ACTIVITIES**

#### **CLINICAL ACTIVITIES SUMMARY**

I am one of the three principal Neuropathologists on both the UCSF surgical neuropathology service and the neuromuscular service. I serve as a neuropathology consultant to SFGH and VAMC for difficult cases. For 2017-2018, I was responsible for 19 weeks of the Moffitt-Long surgical neuropathology service. In addition, I covered 45 nights of neuropathology frozen section call. My neuromuscular service coverage was 13 weeks. In addition to UCSF cases, I maintain a surgical neuropathology and neuromuscular consult practice. I am a neuropathology consultant/collaborator with veterinary pathology at the UC Davis School of Veterinary Medicine. I contribute to both the Brain Tumor Research Center Biospeciman Core and to the Center for Cerebrovascular Research. Clinical training is provided to neuropathology fellows, pathology residents, neurosurgery residents, and veterinary pathology residents through a combination of service and consult cases, in addition to a spectrum of conferences. A significant number of both surgical pathologists and neuropathologists come to UCSF for focused training in neuropathology.

## **CLINICAL SERVICES**

- 1991 - 1988 Moffitt surgical pathology 3 months/year
- 1991 - 2002 Moffitt surgical neuropathology - 6 months/year  
Moffitt autopsy neuropathology - 3 months/year
- 1991 - 2002 SFGH and VAMC weekly autopsy conference - 6 months/year
- 1995 - 2010 Moffitt muscle/nerve service; minimum 5 months service, maximum full service
- 2001 - 2010 Director of Neuropathology; Chief of Clinical Neuropathology
- 2010 - present I attend 20 weeks/year on the Moffitt Surgical Neuropathology Service and attend 20 weeks/year on the Neuromuscular Service. I attend 12 months/year on my surgical neuropathology consultation practice. The neuropathology fellows are an integral part of both the neuromuscular and surgical neuropathology practices. I am a neuropathology consultant for SFGH and VAMC cases in addition to Moffitt autopsy cases. I cover approximately 60 nights/year of the neuropathology night call. In addition, I am a consultant for veterinary neuropathology cases from UC Davis School of Veterinary Medicine. Significant weekly clinical conferences include neuro-oncology tumor board, the neuropathology consensus conference, neuroradiology conference, and the neuromuscular conference.

## **PROFESSIONAL ACTIVITIES**

### **MEMBERSHIPS**

- 1980 - present American Veterinary Medical Association
- 1985 - present American Medical Association
- 1987 - present American Society of Clinical Pathologists
- 1996 - present American Association of Neuropathologists
- 1997 - present Society for Neuro-Oncology
- 1998 - present San Francisco Neurological Society
- 2001 - present United States and Canadian Academy of Pathology
- 2003 - present College of American Pathologists
- 2003 - present American Society for Investigative Pathology

## **SERVICE TO PROFESSIONAL ORGANIZATIONS**

1999 - 2009	Member	American Board of Pathology, Neuropathology Test Committee
2002 - 2004	Chair	American Association of Neuropathologists Awards Committee
2005 - 2010	Member	American Association of Neuropathologists Professional Affairs Committee

## **SERVICE TO PROFESSIONAL PUBLICATIONS**

2005 - present	Journal of Neuropathology and Experimental Neurology
2012 - present	Brain Pathology
2012 - present	Journal of Neuro-Oncology (Six in 2018)
2012 - present	Case Reports in Infectious Disease
2012 - present	Journal of Pediatric Infectious Diseases
2014 - present	Diagnostic Pathology
2014 - present	JAMA Neurology

## **INVITED PRESENTATIONS - NATIONAL**

1991	Multidisciplinary Panel on Diseases of The Skull Base, UCSF	Pathology of Cranial Base Tumors
1995	Dept. of Pathology, Division of Surgical Pathology, Eleventh Annual Current Issues in Anatomic Pathology	Lecture on frozen section diagnosis in neuropathology with correlation of tissue sections to cytologic preparations.
2000	Current Issues in Anatomic Pathology UCSF/Stanford	Approach to the diagnosis of central nervous system infections.
2000	33rd Annual Recent Advances in Neurology, UCSF	CADASIL
2001	34th Annual Recent Advance in Neurology, UCSF	Clinicopathological Conference- Sarcoid

2002	35th Annual Recent Advance in Neurology, UCSF	Sarcoid Clinicopathological Conference Atrial Myxoma
2003	UCSF School of Medicine Neurosurgery Dept, Ground Rounds	Meningioma
2003	Current Issues in Anatomic Pathology UCSF	Diagnostic Problems in Neuropathology
2003	36th Annual Recent Advances in Neurology, CPC	CNS Lymphoma
2004	UCSF-Stanford Current Issues in Anatomic Pathology	Vasculitis CNS Tuberculosis Sarcoid
2004	37th Annual Recent Advances in Neurology, CPC	
2005	38th Annual Recent Advances in Neurology, CPC	
2006	39th Annual Recent Advances in Neurology, CPC	
2009	Feb 21-22, 35th Annual Meeting North American Neuro- Ophthalmology Society Frank B. Walsh Session.	Moderator and Neuropathology expert 24 cases.
2010	40th Annual Recent Advances in Neurology, CPC	Vasculitis
2011	41st Annual Recent Advances in Neurology	CNS Vascular Malformations
2012	42nd Annual Recent Advances in Neurology	Transverse Myelopathy
2013	43rd Annual Recent Advances in Neurology	Mitochondrial Disease
2014	44th Annual Recent Advances in Neurology CPC	Hemophagocytic Lymphohistiocytosis
2015	45th Annual Recent Advances in Neurology CPC	CNS Tuberculosis
2016	46th Annual Recent Advances in Neurology CPC	Peripheral Neuropathy

### **CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT ACTIVITIES**

2004	80th Annual American Association of Neuropathologists, Cleveland, Ohio	
2004	14th Current Issues In Anatomic Pathology, Department Anatomic Pathology, CCSF	
2004	37th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California	
2005	38th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California	



- 2005 81st Annual American Association of Neuropathologists Arlington, Virginia
- 2005 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2006 39th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2006 82nd Annual American Association of Neuropathologists, San Francisco, California
- 2006 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2007 40th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2007 83rd Annual American Association of Neuropathologists, Washington DC
- 2007 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2008 41st Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2008 84th Annual American Association of Neuropathologists, San Diego, California
- 2008 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2009 42nd Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2009 85th Annual American Association of Neuropathologists, San Antonio, Texas
- 2009 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2010 43rd Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2010 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2011 44th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2011 87th Annual American Association of Neuropathologists, Seattle, Washington
- 2011 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2012 20th Annual Rheumatology Board Review and Clinical Update Division of Rheumatology, Department of Medicine, UCSF
- 2012 88th Annual American Association of Neuropathologists, Chicago, Illinois
- 2012 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2012 45th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2013 46th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2013 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF

- 2014 90th Annual American Association of Neuropathologists Portland, Oregon
- 2014 47th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2014 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2015 48th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2015 91st Annual American Association of Neuropathologists, Denver, Colorado
- 2015 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2016 49th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2016 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2017 50th Annual Recent Advances in Neurology Department of Neurology, UCSF, San Francisco, California
- 2017 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2017 93rd Annual American Association of Neuropathologists, Garden Grove, CA
- 2017 IDS 170.03 Genomic and Precision Medicine, UCSF
- 2018 Current Issues in Anatomic Pathology, Dept. Anatomic Pathology UCSF
- 2018 94th Annual American Association of Neuropathologists, Louisville, Kentucky

## **UNIVERSITY AND PUBLIC SERVICE**

### **SERVICE ACTIVITIES SUMMARY**

I am actively involved in several professional societies including the American Association for Neuropathology, and the College of American Pathologists. I chaired the AANP Awards Committee from 2002-2004, and subsequently served as a member of the Professional Affairs Committee. For CAP, I served for ten years on the neuropathology test committee. In the pathology department, I have participated in a variety of departmental committees and recruitments. My principal focus from 2001-2010, as the Director of the Neuropathology Division, was on neuropathology fellow training and faculty development. During this time the Brain Tumor Research Center Biospeciman Core was established and I served variably as Co-Director or Director. In addition, the Anesthesia Center for Cerebrovascular Research was established. Current administrative responsibilities include being on the departmental quality assurance/ improvement committee, and serving as a member of the UCSF Benioff Credentials Committee.

### **UCSF CAMPUSWIDE**

1992 - present Member

UCSF Brain Tumor  
Research Center

1997 - present	Member	BTRC Tissue Bank Committee and Consulting Neuropathologist.
1998 - present	Member	UCSF Cancer Center, Neuro-Oncology Program
2000 - present	Investigator	UCSF Dept. of Anesthesia Center for Cerebrovascular Research
2007 - present	Member	UCSF Medical Center Credentials Committee

### **SCHOOL OF MEDICINE**

2007 - present UCSF Medical Center Credentials Committee

### **DEPARTMENTAL SERVICE**

1989 - 1990	Resident Education Committee
1989 - 1990	UCSF Cancer Committee
1993 - 1993	Residency Evaluation Committee
1991 - 2001	Resident Evaluation Committee
1995 - 1995	Brain/Behavior Subject Area Committee - review and modification of learning objectives/curriculum for basic and clinical neurosciences.
1996 - 2001	Admissions/Residency Committee - Pathology and Laboratory Medicine
1997 - 2000	Program Chairman, Department of Pathology Resident Teaching and Grand Rounds
1997 - present	Pathology Quality Assurance/Improvement Committee
2001 - 2010	Director of Neuropathology Division
2001 - 2010	Director of Neuropathology Fellowship Training Program
2002 - 2002	Chair, Neuropathology Faculty Search Committee - Dr. Tihan
2003 - 2003	Member, Neuropathology Faculty Search Committee - Dr. VandenBerg
2007 - present	Member Neuropathology Faculty Search Committee- Dr. Margeta

2010 - present NP Fellowship Competency Committee

## TEACHING AND MENTORING

### TEACHING SUMMARY

My formal teaching hours are approximately 150 hours, including the neuropathology training/board review for the rotating neurology residents. From 2002-2012 I coordinated and was the principal contributor to the Neurology/Neuropathology CPC Program. I significantly increased the neuropathology consultation practice at UCSF in both CNS surgical neuropathology and neuromuscular consultations from 2000-2012. The spectrum of in-house and consultative cases, in addition to the UCSF inpatient cases with over 500 intraoperative consultations/year provides the basis for 3-4 hours/day of neuropathology fellow training. Both the neuropathology fellow and pathology residents participate in the inpatient sign-out; pathology residents on elective participate in the entire spectrum of cases (approximately 8 pathology residents take the NP elective/year). Additional teaching includes rotating neurology residents and neurosurgery residents, in addition to a large number of visiting pathologists. In addition I spend 1day/month reviewing UC Davis Veterinary Neuropathology cases with the UC Davis School of Veterinary Medicine pathology faculty and residents.

Neuropathology Fellowship Administration 2000-2010

Successfully completed accreditation review in 2005 (5 year Accreditation). During my service as Director of the Neuropathology Fellowship (2000-2010) the UCSF Neuropathology program has been one of most successful programs in the United States in contributing members to the American Association of Neuropathologists. All fellows have completed board certification. This excellence has continued and expanded under the current Director Dr. Arie Perry.

### FORMAL TEACHING

	Academic Yr	Course No. & Title	Teaching Contribution	School	Class Size
	1988 - 1989	Pathology 102	Neuropathology Lectures: 2 hours		140
	1992 - 1994	Pathology x 126: 135: 135.01	Neuropathology Lectures: 3 hours		127
	1991 - 2001	Pathology 102	Neuropathology Lectures and Lab: 8 hours		140/24
	1995 - 1999	Pathology 101 Pre-Fall small group case discussions	2 hours		13
	2000 - 2013	Neurology Grand Rounds CPC 6/year.			

	Academic Yr	Course No. & Title	Teaching Contribution	School	Class Size
	2000 - 2013	Lectures/Microscope tutorials Neurology/Neurosurgery Resident Board Preparation. 8 residents/year 12 hours/month (150 hours/year). Neurosurgery residents as their schedule allows.			
	2002 - 2003	IDS 104 Brain, Mind, Behavior	2 Lectures		127
	2002 - 2003	Small group 6 sessions- 20 hours Exam meetings: 4 hours			14
	2003 - 2013	Fourth year medical student tutorials. Four 2 hour sessions-CNS Neoplasms; CNS Infections.			
	2003 - present	CNS infectious Disease 4 hours lecture and diagnostic slide session to anatomic pathology residents.			
	2008 - 2010	Anatomic Path-Neuropathology Board Review 2 hours to anatomic pathology residents.			
	2010 - present	Four unknown CNS sessions/year with surgical pathology residents and fellows.			

### MENTORING SUMMARY

While I served as a clinical mentor early in my career, beginning in 2001 when I became Director of Neuropathology this role expanded, and has continued subsequent to 2010. This included current faculty members Marta Margeta, Joanna Phillips, and Han Sung Lee. In

addition I have assisted in the career development of Dr. Anne Buckley (Duke University) and Dr. Jose Otero ( Ohio State University).

### POSTDOCTORAL FELLOWS AND RESIDENTS MENTORED

Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
1990 - 1992	Jack Raisanen, MD	Neuropathology Fellow		Clinical Mentor	Professor of Pathology University of Texas Southwestern Dallas, Texas
1991 - 1993	Kenneth Aldape, MD Tlsty Lab	Neuropathology Fellow		Clinical Mentor	Professor of Pathology Toronto General Hospital Toronto, Canada
1992 - 1995	Rosalie Uht, M.D., Ph.D.	Neuropathology Fellow		Clinical Mentor	Associate Professor of Pathology and Biochemistry University of Virginia Medical School
1993 - 1995	Kondi Wong, M.D.	Neuropathology Fellow		Clinical Mentor	Colonel USAF Neuropathology AFIP Washington DC
1995 - 1997	Randolph Nixon, M.D., Ph.D	Neuropathology Fellow DeArmond Lab		Clinical Mentor	Neuropathologist Vista Pathology Lab Medford, Oregon
1995 - 1997	Eric Huang, M.D., Ph.D.	Neuropathology Fellow Reichardt Lab		Clinical Mentor	Professor UCSF Pathology

Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
1996 - 2012	Rotating Neurology Residents - 12 hours/month, 11 Residents/year	Neurology Residents and Fellows		Neuropathology training/Board preparation	
1997 - 1999	Martha Simmons, M.D., Ph.D.	Neuropathology Fellow		Clinical Mentor	Sutter Health PAMF
1998 - 2000	David Gaskin, M.D.	Neuropathology Fellow		Clinical Mentor	Pathologist Canada
1999 - 2001	Jane Uyehara-Lock M.D.	Neuropathology Fellow		Clinical Mentor	Pathologist, Hawaii Permanente Medical Group
2001 - 2003	William McDonald, M.D.	Neuropathology Fellow Deen Lab		Clinical/Career/Research Mentor	Director Department of Pathology Abbott NW Hospital Minneapolis, MN
2002 - 2004	Aria Gheyara (Sheila Niewmierzycka) MD, Ph.D	Neuropathology Fellow Reichardt Lab		Clinical/Career Mentor	Pathologist, Color Genomics Burlingame, CA
2003 - 2005	Marta Margeta, M.D., Ph.D.	Neuropathology Fellow Lilly Jan Lab		Clinical/Career Mentor	Associate Professor Neuropathology
2004 - 2006	Joanna Phillips, M.D., Ph.D.	Neuropathology Fellow Zena Werb Lab		Clinical/Research/Career Mentor	Associate Professor Neuropathology and Neurosurgery UCSF

Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2006 - 2008	Anne Buckley, M.D., Ph.D.	Neuropathology Fellow		Clinical/Research/Career Mentor	Assistant Professor Neuropathology, Duke University
2007 - 2009	Han Sung Lee, M.D., Ph.D. Eric Huang Lab	Neuropathology Fellow		Clinical/Research/Career Mentor	Assistant Professor Neuropathology, UCSF
2008 - 2010	Jose Otero, M.D., Ph.D.	Neuropathology Fellow Rowitch Lab		Clinical/Research/Career Mentor	Assistant Professor Neuropathology, Ohio State University
2009 - 2011	Michael Barnes, M.D.	Neuropathology Fellow Costello Lab		Clinical/Research/Career Mentor	Pathology/Neuropathology Roche/Ventana Tucson, Arizona
2010 - 2012	Michelle Madden Felicolla, M.D.	Neuropathology Fellow Perry Lab		Clinical/Career Mentor	Neuropathologist Henry Ford Hospital Detroit, Michigan
2011 - 2012	Aseem Lal, M.D.	Neuropathology trainee		Clinical Mentor	Cytopathology/Pathology San Francisco
2011 - 2013	Anne Hiniker MD, Ph.D	Neuropathology Fellow Oakes Lab		Clinical/Career Mentor	Clinical Instructor UCSF
2012 - 2014	Melike Pekmezci, M.D.	Neuropathology Fellow Tihan Lab		Clinical/Career Mentor	Assistant Professor UCSF



Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2012 - 2014	Gerald Reis, M.D., Ph.D.	Neuropathology Fellow Perry/Phillips Lab		Clinical/Career Mentor	Pathology/NP Memorial Healthcare System Hollywood, Florida
2015 - present	Silvia Siso DVM. Ph.D	Anatomic Pathology Resident/NP Fellow University of California, Davis School of Veterinary Medicine		Clinical/Career/Research Mentor	Pathologist, BioMarin Pharmaceuticals
2013 - 2015	Jennifer Cotter, M.D. Huang Lab	Neuropathology Fellow		Clinical/Career Mentor	Assistant Professor, Children's Hospital USC
2013 - 2015	Sanda Alexandrescu, M.D.	Neuropathology Fellow Perry/Phillips Lab		Clinical/Career Mentor	Assistant Professor Pathology Harvard Children's
2014 - present	Matthew Wood, M.D., Ph.D.	Neuropathology Fellow		Clinical Mentor	Assistant Professor, University of Oregon School of Medicine
2014 - present	David Solomon, M.D., Ph.D.	Neuropathology Fellow		Clinical Mentor	Assistant Professor, Neuropathology UCSF
2015 - present	Christopher Liverman M.D., Ph.D	Neuropathology Fellow		Clinical Mentor	Forensic Pathology Fellow, University of Texas

Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2015 - present	Amber Nolan M.D., Ph.D	Neuropathology Fellow		Clinical Mentor	Clinical Instructor, UCSF
2016 - present	Giselle Lopez, M.D., Ph.D	Neuropathology Fellow		Clinical/Career Mentor	Neuropathology Fellow
2016 - present	Areli Cuevas-Ocampo M.D., Ph. D	Neuropathology Fellow		Clinical Mentor	Neuropathology Fellow
2017 - present	Sean Ferris M.D., Ph. D	Neuropathology Fellow		Clinical Mentor	Neuropathology Fellow
2017 - present	Julieann Lee M.D., Ph. D	Neuropathology Fellow		Clinical Mentor	Neuropathology Fellow

## RESEARCH AND CREATIVE ACTIVITIES

### RESEARCH AND CREATIVE ACTIVITIES SUMMARY

#### MAJOR RESEARCH INTERESTS:

Brain Tumors; Infections of the Central Nervous System; Radiation effect; CNS Vascular Malformations; Epilepsy; Skeletal Muscle and Peripheral Nerve Disease; Veterinary Neuropathology.

#### RESEARCH ACTIVITIES

I collaborate with investigators on the translational research within both the Neuro-Oncology Cancer Center and SPORC Grants, in particular with the laboratories of Dr. Joseph Costello and Dr. Joanna Phillips. With Dr. Robert Higgins of the U.C. Davis School of Veterinary Medicine, I am working on brain tumor model systems and naturally occurring CNS neoplasms. With Robert Higgins I authored Chapter 19 Tumors of the Nervous System for the 5th edition (2017) of Tumors in Domestic Animals. With Dr. William Young I developed a tissue core for CNS vascular malformations, and studied the biology of CNS AVMs. This has continued with Dr. Rong Wang, with the study of animal model systems of vascular malformations. These collaborations have contributed significantly to the award of the NINDS Grant RO1 NS0444155-068 Integrative Study of Brain Vascular Malformations. In collaboration with Dr. Carol Glaser of the California Encephalitis Project I have improved surveillance techniques for encephalitis, and now collaborate with Dr. Michael Wolson of Neurology. With the establishment of the Molecular Pathology Laboratory of Dr. David Solomon, I participate in multiple studies of glial and neuroglial neoplasms.

#### RESEARCH AWARDS - PAST

- |                |      |            |            |
|----------------|------|------------|------------|
| 1. R01 CA85356 | Deen |            |            |
| NIH            |      | 2001-02-01 | 2006-01-31 |

Gene Therapy Targeting Hypoxic Glioma Cells. This project has 2 goals. The first is to investigate how several cellular or intratumoral characteristics impact on this gene therapy strategy. The second is to investigate whether the gene therapy enhances the radiation response of the tumor cells

2.	P01 NS42927 NIH	Berger	2001- 09-30	2005- 08-31
<p>Program for Treatment of Malignant Brain Tumors. Project 1 (Prados): Clinical Therapy for Malignant Brain Tumors. The main focus of this Project is to evaluate and treat patients with malignant brain tumors emphasizing the use of modalities that will control both local and regional disease using Phase I and II trials.</p>				
3.	P01 NS42927 NIH	Berger	2001- 09-30	2005- 08-31
<p>Program for Treatment of Malignant Brain Tumors. Scientific Core (Deen). The Scientific Core will provide support services - Tissue Bank, the Molecular Marker Laboratory, the Animal Model Laboratory and Biostatistics - to each of the 4 projects within the Program Project</p>				
4.	P50 CA97257 NIH	Berger	2002- 09-20	2007- 04-30
<p>Brain Tumor SPORE Grant-Support transferred to Dr. Tihan &amp; Dr. VandenBerg 2005. Tissue Bank Core (Deen). The Tissue Bank Core will provide services to each of the projects in the Brain Tumor SPORE and will distribute brain tumor tissue samples to SPORE investigators and to create tissue arrays from a variety of brain tumor types.</p>				
5.	P30 CA82103 NIH	McCormick	2002- 08-01	2007- 01-31

Cancer Center Support Grant/Tissue Core- Support transferred to Dr. VandenBerg 2005. The Cancer Center Support Grant funds are used to support the activities of the Cancer Center's various Cores. The Tissue Core collects, processes and distributes human tissues to researchers. It provides full histology support, including slide preparation, stains, and pathology review.

6.	R01 CA92133 NIH	Pollock	2002- 07-01	2002- 07-01
	Therapy of Glioblastoma with a Novel Apoptotic Peptide / Subcontract (Deen) . We will investigate the therapeutic potential of IL-1a propiece alone and in combination with radiation using a xenograft model in which human brain tumor cells are grown intracerebrally in athymic rats.			
7.	R01 NS27713 NIH/NINDS	Young	2001- 06-01	2006- 05-31
	Hemodynamics of Cerebral Arteriovenous Malformations. The major goal is to characterize the vascular biology of a disease process for which there exists no explicit animal model and to use AVMs as model for chronic cerebral hypotension that is well compensated, both clinically and physiologically.			
8.	R01 NS41877 NIH/NINDS	Young	2000- 09-30	2006- 08-31
	Upstream regulators of the Prothrombotic State. The major goal is to investigate prothrombotic states in the human cerebral circulation by using a unique clinical model-pial cerebral arteriovenous malformations. This grant has been extended to 8/31/05.			
9.	P01 NS044155 NIH	Young	2003- 10-01	2008- 06-30
	Integrative study of Brain Vascular Malformations. The goal is to develop animal models of vascular dysplasia and to investigate flow-induced vascular remodeling.			

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10. R01 NS044155-06A	Young		
NINDS		2009-04-01	2014-03-31

The goals of this integrated study include investigation of the molecular pathology of AVM's in patients, evaluation of the role of flow-induced vascular remodeling, and the development of animal model systems of vascular dysplasia.

### PEER REVIEWED PUBLICATIONS

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## **BOOKS AND CHAPTERS**

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## **SIGNIFICANT PUBLICATIONS**

1. Progressive multifocal leukoencephalopathy in a patient treated with natalizumab. Langer-Gould A, Atlas SW, Green AJ, Bollen AW, Pelletier D. N Engl J Med. 2005 Jul 28;353(4):375-81.

Made diagnosis of PML on brain biopsy, participated in writing and editing paper.

2. Correlation of magnetic resonance spectroscopic and growth characteristics within Grades II and III gliomas. Smith JS, Lal A, Harmon-Smith M, Bollen AW, McDermott MW. J Neurosurg. 2007 Apr;106(4):660-6.

I did the histopathologic analysis of all gliomas in this study.

3. Magnetic resonance imaging and histological classification of intracranial meningiomas in 112 dogs. Sturges BK, Dickinson PJ, Bollen AW, Koblick PD, Kass PH, Vernau KM, Knipe MF, LeCouteur RA, Higgins RJ. Journal Veterinary Internal Medicine, 2008, May-June (22), 586-95

One of a series of collaborations with Dr. Robert Higgins at U.C. Davis School of Veterinary Medicine. I reviewed human meningiomas with Dr. Higgins to provide a frame work for this analysis, and subsequently performed histopathologic analysis of this set of canine meningiomas.



4. Endothelial Notch4 signaling induces hallmarks of brain arteriovenous malformations in mice. Murphy PA, Lam Mt, Wu X, Kim TN Vartanian SM, Bollen AW, Carlson TR, Wang RA. Proc Natl Acad Sci USA. 2008 Aug 5; 105(31):10901-6 Epub 2008 Jul 30.  
Provided all pathologic support in the development and analysis of this brain AVM mouse model. Participated in laboratory meetings to assist in the development of model.
5. Balamuthia Amebic Encephalitis-California, 1999-2007 MMWR. 2008; 57:768-771  
As the neuropathology consultant of the California Encephalitis Project reviewed/make initial diagnosis of referred encephalitis/CNS infection cases. Identified a series of Balamuthia amebic encephalitis cases. Worked with both Dr. Carol Glaser and Dr. Fred Schuster in the development of an indirect immunofluorescence assay.
6. Under the Radar: Balamuthia Amebic Encephalitis. Schuster F, Yagi S, Gavali S, Michelson D, Raghavan R, Blomquist I, Glastonbury C, Bollen A, Scharnhorst D, Reed S, Kuriyama, Visvesvara G, and Glaser C. CID 2009;48 (1 April): 879-887.  
Provided initial diagnosis of multiple cases, reviewed all for which brain tissue evaluation was available. Reviewed multiple cases of other etiologies to exclude as diagnosis in the development of diagnostic assays. Participated in writing/editing manuscript.
7. Expression of the tumor suppressor genes NF2, 4.1B, and TSLC1 in canine meningiomas. Dickinson PJ, Surace EI, Cambell M, Higgins RJ, Leutenegger CM, Bollen AW, LeCouteur RA, Gutmann DH. Vet Pathol. 2009 Sep;46(5):884-92.  
Reviewed and classified all canine meningiomas in this series.
8. Notch4 Normalization Reduces Blood Vessel Size in Arteriovenous Malformations. Murphy PA, Kim TN, Lu G, Bollen AW, Schaffer CB, Wang RW. Science Translational Medicine 4, 117ra8 (2012)  
Participated in laboratory meetings on model system, evaluated blood vessel and brain morphology with spectrum of immunofluorescent and H+E preparations.
9. Clinical utility of LC3 and p62 Immunohistochemistry in Diagnosis of Drug-Induced Autophagic Vacuolar Myopathies: A Case-Control Study. Margeta M; Lee HS, Daniels B; Salas E; BollenA; Debnath J. PLoS ONE, April 2012, 7 (4) e36221  
Series of autophagic vacuolar myopathies. Review of cases and independent review of EM findings to complete classification relative to LC3 and P62 findings.
10. Temporal and Geographic Clustering of Polyomavirus-Associated Olfactory Tumors in 10 Free-Ranging Raccoons (Procyon lotor). Giannitti F1, Higgins RJ, Pesavento PA, Cruz FD, Clifford DL, Piazza M, Struckhoff AP, Valle LD, Bollen AW, Puschner B, Kerr E, Gelberg H, Mete A, McGraw S, Woods LW. Vet Pathol. 2013 Sep 17.  
Established correct diagnosis for this group of polyomavirus- associated olfactory neoplasms in raccoon population. Reviewed all cases; supervised additional studies needed for correct diagnosis.

11. Mutational analysis reveals the origin and therapy driven evolution of recurrent glioma. Johnson B, Mazor T, Hong C, Barnes M, McLean C, Fouse S, Jalbert L, Nelson S, Gonzalez S, Bollen A, Olshen A, Cha S, Zhao Y, Moore R, Mungall A, Jones S, Hirst M, Marra M, Berger M, Song J, Chang S, Taylor B, Costello J. *Science*. 2014 Jan 10;343(6167):189-93. doi: 10.1126/science.1239947.  
  
Reviewed all gliomas, evaluation of immunohistochemistry studies during development and application. This important study suggests that genetic changes driving recurrence are different from the initial neoplasm. (See commentary *JAMA* February 5, 2014 page# 456.)
12. Diffuse Midline Gliomas with Histone H3-K27M Mutation: A Series of 47 Cases Assessing the Spectrum of Morphologic Variation and Associated Genetic Alterations. D.A. Solomon, M.D. Wood, T. Tihan, A.W. Bollen, N. Gupta, J.J. Phillips, A. Perry. October 2015. Article. *Brain Pathology*  
  
Initial diagnosis of multiple cases; participated in review of entire set of cases.
13. Genetic confirmation that ependymoma can arise as part of multiple endocrine neoplasia type 1 (MEN1) syndrome. Cuevas-Ocampo AK, Bollen AW, Goode B, Pajtler KW, Chavez L, Sharma T, Dai SC, McDermott M, Perry A, Korshunov A, Solomon DA. Apr 2017 *Acta Neuropathologica* 133(4):661-663  
  
Diagnosis of case, initiated study with Dr. Cuevas-Ocampo.
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Diagnostic neuropathologist for this large set of pediatric CNS neoplasms along with Drs. Perry and Tihan.
15. Clonal expansion and epigenetic reprogramming following deletion or amplification of mutant IDH1. Mazor T, Chesnelong C, Pankov A, Jalbert LE, Hong C, Hayes J, Smirnov IV, Marshall R5, Souza CF, Shen Y, Viswanath P, Noushmehr H, Ronen SM, Jones SJM, Marra MA, Cairncross JG, Perry A, Nelson SJ, Chang SM, Bollen AW, Molinaro AM, Bengtsson H, Olshen AB, Weiss S, Phillips JJ, Luchman HA, Costello JF. Oct 2017 *Proceedings of the National Academy of Sciences of the United States of America* 114(40):10743-10748  
  
As part of ongoing collaborations with laboratory of Dr. Joseph Costello reviewed all cases and pathologic analysis with Dr. Tali Mazor.
16. Angiocentric glioma with MYB-QKI fusion located in the brainstem, rather than cerebral cortex. Chan E, Bollen AW, Sirohi D, Van Ziffle J, Grenert JP, Kline CN, Tihan T, Perry A, Gupta N, Solomon DA. Oct 2017 *Acta Neuropathologica* 134(4):671-673  
  
Made diagnosis of this infrequent glioma in unusual location and initiated study with Dr. Solomon.

17. The genetic landscape of anaplastic pleomorphic xanthoastrocytoma. Brain Pathol. Phillips JJ, Gong H, Chen K, Joseph NM, van Ziffle J, Bastian BC, Grenert JP, Kline CN, Mueller S, Banerjee A, Nicolaidis T, Gupta N, Berger MS, Lee HS, Pekmezci M, Tihan T, Bollen AW, Perry A, Shieh JTC, Solomon DA.

Reviewed all cases with Dr. Joanna Phillips.