
BIOGRAPHICAL SKETCH

NAME: Chitnis, Tanuja

eRA COMMONS USER NAME (credential, e.g., agency login): TC1234

POSITION TITLE: Professor of Neurology

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	DATE	FIELD OF STUDY
University of Toronto, Toronto, Ontario, CA	B.Sc.	1990	Microbiology
University of Toronto, Toronto, Ontario, CA	M.D.	1994	Medicine
Hahnemann University Hospital, Philadelphia, PA, US	Residency	1998	Neurology
Brigham and Women's Hospital, Boston, MA, US	Fellowship	2001	Neuroimmunology

A. Personal Statement

I am a Professor of Neurology at Harvard Medical School, practicing neurologist, and Director of the Translational Neuroimmunology Research Center at the Brigham and Women's Hospital, which includes a team of laboratory staff, data analysts and fellows. I also direct the CLIMB Natural History study at the Partners MS Center, Brigham and Women's Hospital which follows over 2000 adult MS patients longitudinally. In addition, I am the Director of the Partners Pediatric MS Center at Massachusetts General Hospital, which cares for children with multiple sclerosis and related neuroimmunological disorders.

My research work focuses on the study of predictors and modulators of disease course of MS patients of all ages, including clinical and neuroimaging features as well as immunological and hormonal biomarkers. I lead several clinical trials in pediatric MS therapeutics, and phase I studies for adult MS therapeutics. I have published over 200 peer-reviewed articles in MS and related disorders.

I am the current chair of the International Pediatric MS Study Group, an executive board member of the U.S. Network of Pediatric MS Centers of Excellence. I am the co-chair of the upcoming ACTRIMS forum, and a Fellow of the American Academy of Neurology.

I am additionally the co-Director of the Partners MS Center Fellowship Program as well as the Harvard Combined Pediatric MS and Neuroimmunology Fellowship Program. I have trained over 20 fellows in adult and pediatric MS clinical management, translational and Neuroimmunology research.

B. Positions and Honors

POSITIONS & EMPLOYMENT

1994-95	Medicine Internship, Department of Internal Medicine, Thomas Jefferson University Hospital, PA
1995-98	Neurology Residency, Department of Neurology, Hahnemann University Hospital, PA
1997-98	Chief Resident Neurology, Department of Neurology, Hahnemann University Hospital, PA
1998-2001	Research Fellow, Center for Neurologic Diseases, Brigham and Women's Hospital, Boston, MA
2001-06	Instructor in Neurology, Harvard Medical School, Boston, MA
2001-06	Assistant Scientist, Center for Neurologic Diseases, Brigham and Women's Hospital, Boston, MA
2001-06	Assistant Neurologist, Department of Neurology, Brigham and Women's Hospital, Boston, MA
2002 –	Clinical Affiliate, Department of Neurology, Massachusetts General Hospital, Boston, MA
2005 –	Director, Partners Pediatric Multiple Sclerosis Center, MGH, Boston, MA
2006-13	Assistant Professor of Neurology, Harvard Medical School, Boston, MA
2006-13	Associate Scientist, Center for Neurologic Diseases, Brigham and Women's Hospital, Boston, MA

2006-13 Associate Neurologist, Department of Neurology, Brigham and Women's Hospital, Boston, MA
 2008 – Medical Director, Multiple Sclerosis Natural History Study, BWH, Boston, MA
 2011 – Co-Director, Partners MS Center Fellowship Program, Boston, MA
 2011 – Co-Director, Combined Harvard Pediatric MS and Neuroimmunology Fellowship Program, Boston, MA
 2013-18 Associate Professor of Neurology, Harvard Medical School, Boston, MA
 2013-18 Scientist, Ann Romney Center for Neurologic Diseases, Brigham and Women's Hospital, Boston, MA
 2013-18 Neurologist, Department of Neurology, Brigham and Women's Hospital, Boston, MA
 2018 – Professor of Neurology, Harvard Medical School, Boston, MA
 2018 – Senior Scientist, Ann Romney Center for Neurologic Diseases, Brigham and Women's Hospital, Boston, MA
 2018 – Senior Neurologist, Department of Neurology, Brigham and Women's Hospital, Boston, MA

HONORS & AWARDS

1998 American Academy of Neurology Resident Award
 2000 Dale McFarlin Travel Award, National Multiple Sclerosis Society
 2001 Federation of Clinical Immunology Society Travel Award
 2002 Excellence in Scientific Presentations at AAN Meeting, Indian Assoc. Neurologists
 2006 – Pediatric MS Center of Excellence, National Multiple Sclerosis Society
 2007 Health Professional Volunteer Award, Central New England Chapter, NMSS
 2010-11 Chair, U.S. Pediatric MS Centers of Excellence
 2010- Chair, International Pediatric MS Study Group
 2011-15 Topic Chair, Multiple Sclerosis – AAN meeting 2012, 2013, 2014, 2015
 2016 Distinguished Clinician Award – Brigham and Women's Hospital

PROFESSIONAL AFFILIATIONS

2006 – Member, Steering Committee, US Network of Pediatric MS Centers of Excellence
 2007 – Member, Clinical Advisory Board, National MS Society
 2010 – Chair, International Pediatric MS Study Group
 2011-13 Member, NINDS Common Data Elements, MS and Pediatric MS, NIH/NINDS
 2014 – Member, Nominating Committee, ACTRIMS
 2016 – Member, Program Committee, ACTRIMS
 2016 – Fellow, American Academy of Neurology

RESEARCH EXPERIENCE

1997-98 Immunologic response to genetically engineered astrocytes transplanted into the CNS
 Resident award
 1998-2001 Th1 and Th2 cytokine response in EAE; Role of Bcl-xL in EAE
 National MS Society (NMSS) postdoctoral fellowship
 2001-04 Costimulation in EAE
 Funding: Nancy Davis Center Without Walls, Young Investigator Award
 2004-09 Role of CD200-CD200R1 in EAE, Mechanisms of neuroprotection in EAE
 Funding: KO8, NINDS, NIH
 2006 – Disease phenotypes, biomarkers and response to treatment in pediatric MS
 Funding: NMSS, Regional Pediatric MS Centers of Excellence Award
 2008 – Disease phenotypes, biomarkers and response to treatment in adult MS
 Funding: NMSS Research Grant, Investigator-initiated RG – Novartis, Serono

C. Contributions to Science

1. Immune Mechanisms in Multiple Sclerosis. During my postdoctoral training years, I focused on developing an in depth understanding of the immunological mechanisms of multiple sclerosis through work on experimental autoimmune encephalomyelitis (EAE) animal model in the laboratory of Dr. Samia Khoury at the Brigham and Women's Hospital. I was funded by a postdoctoral fellowship award from the NMSS (1998-2001), and a career development award from the Nancy Davis Center Without Walls (2001-2004). My focus was on elucidating the role of Th1/Th2 responses and costimulatory molecules in EAE. As I progressed

towards independence, I focused my KO8 (NS47669 2005-2010) work on understanding the role of axonal protection in the *Wld^s* murine model. My work demonstrated that protection occurs through enhanced neuronal expression of the CD200 molecule, and further studies demonstrated this regulates both T cell and microglial responses in EAE resulting in axonal protection.

- a. **Chitnis T**, Najafian N, Abdallah KA, Dong V, Yagita H, Sayegh MH, Khoury SJ. CD28-independent induction of experimental autoimmune encephalomyelitis. *J Clin Invest*. 2001 Mar;107(5):575-583. PMID: 11238558; PMCID: PMC199425.
- b. **Chitnis T**, Najafian N, Benou C, Salama AD, Grusby MJ, Sayegh MH, Khoury SJ. Effect of targeted disruption of STAT4 and STAT6 on the induction of experimental autoimmune encephalomyelitis. *J Clin Invest*. 2001 Sep;108(5):739-747. PMID: 11544280; PMCID: PMC209380.
- c. **Chitnis T**, Imitola J, Wang Y, Elyaman W, Chawla P, Sharuk M, Raddassi K, Bronson RT, Khoury SJ. Elevated neuronal expression of CD200 protects Wlds mice from inflammation-mediated neurodegeneration. *Am J Pathol*. 2007 May;170(5):1695-1712. PMID: 17456775; PMCID: PMC1854964.
- d. Liu Y, Bando Y, Vargas-Lowy D, Elyaman W, Khoury SJ, Huang T, Reif K, **Chitnis T**. CD200R1 Agonist Attenuates Mechanisms of Chronic Disease in a Murine Model of Multiple Sclerosis. *J Neuroscience*. 2010 Feb 10;30(6):2025-38. PMID: 20147531; PMCID: PMC2837938.

2. Pediatric multiple sclerosis research. I have been at the forefront of research in pediatric MS. In 2004, I established the first pediatric MS Center in New England at MGH. I was awarded the NMSS Pediatric MS Centers of Excellence Award (2005-2012) in which I work with a network of clinical sites, to establish guidelines for clinical care and research including a database for pediatric MS. I have made seminal observations on the course, mechanisms and outcomes in pediatric MS. Through my work as the chair of the International Pediatric MS Study Group, which includes membership of over 150 clinicians worldwide (2010-present) I have led the development of guidelines for clinical trials in pediatric MS.

- a. Gorman MP, Healy BC, Polgar-Turcsanyi M, **Chitnis T**. Increased relapse rate in pediatric-onset compared with adult-onset multiple sclerosis. *Arch Neurol*. 2009 Jan;66(1):54-9. PMID: 19139299. Not federally funded.
- b. **Chitnis T**, Glanz B, Jaffin S, Healy B. Demographics of pediatric-onset multiple sclerosis in an MS center population from the Northeastern United States. *Mult Scler*. 2009 May;15(5):627-31. PMID:19299440.
- c. Vargas-Lowy D, Kivisaak P, Gandhi R, Radassi K, Gorman MP, Khoury SJ, **Chitnis T**. Increased Th17 response to myelin peptides in pediatric multiple sclerosis. *Clin Immunol*. 2013 Mar;146(3):176-84. PMID: 23352968. Not federally funded.
- d. **Chitnis T**, Tardieu M, Amato MP, Banwell B, Bar-Or A, Ghezzi A, Kornberg A, Krupp L, Pohl D, Rostasy K, Tenembaum S, Waubant E, Wassimer E. International Pediatric MS Study Group Clinical Trials Summit: meeting Report. *Neurology*. 2013 Mar 19;80(12):1161-8. PMID: 23509048; PMCID: PMC3662305.

3. CLIMB Observational Cohort Study. I am the Medical Director of the CLIMB (Comprehensive Longitudinal Investigations in MS at BWH) observational cohort which is a one of a kind study following over 2000 MS patients with annual MRI, clinical evaluations and blood studies. This observational study has served as a model for bench-bedside translational investigation of MS and the establishment of a comprehensive MS Center has been replicated throughout the United States and overseas based on the model we established at the Brigham and Women's Hospital. I have made seminal observations on the course of MS and correlation with biomarkers funded through research grants from the NMSS. I have directed the development of novel statistical methods including machine-learning techniques with the overall goal of developing predictive models for MS disease course and response to treatment.

- a. Gholipour T, Healy B, Baruch N, Weiner HL, **Chitnis T**. Demographic and clinical characteristics of malignant multiple sclerosis. *Neurology*. 2011 Jun 7;76(23):1996-2001. PMID: 21646626.
- b. Healy BC, Engler D, Glanz B, Musallam A, **Chitnis T**. Assessment of definitions of sustained disease progression in relapsing-remitting multiple sclerosis. *Mult Scler Int*. 2013;2013:189624. PMID: 23555057; PMCID: PMC3608311.
- c. Malik MT, Healy B, Benson L, Kivisaak P, Musallam A, Weiner H, **Chitnis T**. Factors associated with recovery from acute optic neuritis in patients with multiple sclerosis. *Neurology*. 2014 Jun

17;82(24):2173-9. PMID: 24850491; PMCID: PMC4113460.

- d. Liu J, Brodley CE, Healy BC, **Chitnis T**. Removing confounding factors via constraint-based clustering: An application to finding homogeneous groups of multiple sclerosis patients. *Artif Intell Med*. 2015 Oct;65(2):79-88. PMID: 26253753. Not federally funded.

4. Hormonal mechanisms in MS. A branch of my translational work has been to explore the role of adipokine and sex hormones in multiple sclerosis, which exert an effect both on disease risk and course using data and samples from the CLIMB and pediatric MS cohorts.

- a. Messina S, Vargas-Lowry D, Musallam A, Healy BC, Kivisakk P, Gandhi R, Bove R, Gholipour T, Khoury S, Weiner HL, **Chitnis T**. Increased leptin and A-FABP levels in relapsing and progressive forms of MS. *BMC Neurol*. 2013 Nov 11;13(1):172. PMID: 2421502; PMCID: PMC3829106.
- b. Bove R, Musallam A, Healy B, Raghavan K, Glanz B, Bakshi R, Weiner H, De Jager P, Miller K, **Chitnis T**. Low testosterone is associated with disability in men with multiple sclerosis. *Mult Scler*. 2014 Oct;20(12):1584-92. PMID: 24710799; PMCID: PMC4188801.
- c. Bove R, Malik MT, Diaz-Cruz C, Chua A, Saraceno TJ, Bargiela D, Greeke E, Glanz BI, Healy BC, **Chitnis T**. The 2D:4D ratio, a proxy for prenatal androgen levels, differs in men with and without MS. *Neurology*. 2015 Oct 6;85(14):1209-13. PMID: 26341868; PMCID: PMC4607599.
- d. Bove R, Healy B, Musallam A, Glanz B, De Jager P, **Chitnis T**. Exploration of changes in disability after menopause in a longitudinal multiple sclerosis cohort. *Mult Scler*. 2016 Jun;22(7):935-43. PMID: 26447063; PMCID: PMC4824677.

5. Neuromyelitis optica. I have used my expertise in clinical and translational research to investigate the disease course of NMO in children and adults. I am a member of international efforts through the Guthy-Jackson Foundation to develop standardized datasets and diagnostic definitions for NMO (neuromyelitis optica) and demyelinating diseases. I am the PI of a funded project through the Guthy-Jackson Charitable Foundation to study the clinical and MRI phenotypes of children with NMO spectrum disorders.

- a. Pandit L, Asgari N, Apiwattanakul M, Palac J, Paul F, Leite MI, Kleiter I, **Chitnis T**; GJCF International Clinical Consortium & Biorepository for Neuromyelitis Optica. Demographic and clinical features of neuromyelitis optica: A review. *Mult Scler*. 2015 Jun;21(7):845-53. Review. PMID: 25921037, PMCID: PMC4463026.
- b. Wingerchuk DM, Banwell B, Bennett JL, Cabre P, Carroll W, **Chitnis T**, de Seze J, Fujihara K, Greenberg B, Jacob A, Jarius S, Lana-Peixoto M, Levy M, Simon JH, Tenmbaum S, Traboulsee AL, Waters P, Wellik KE, Weinshenker BG. International consensus diagnostic criteria for neuromyelitis optica spectrum disorders. *Neurology*. 2015 July 14;85(2):177-89. Review. PMID: 26092914, PMCID: PMC4515040.
- c. **Chitnis T**, Ness J, et al. Clinical features in neuromyelitis optica of children: US Network of Pediatric MS Centers report. *Neurology*. 2016 Jan 19;86(3):245-52. PMID: 26683648; PMCID: PMC4733158.
- d. Fernandez-Carbonell C, Vargas-Lowry D, Musallam A, Healy B, McLaughlin K, Wucherpfennig KW, **Chitnis T**. Clinical and MRI phenotype of children with MOG antibodies. *Mult Scler*. 2016 Feb;22(2):174-84. PMID: 26041801; PMCID: PMC4669239.

Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/tanuja.chitnis.1/bibliography/40449949/public/?sort=date&direction=ascending>