

Benjamin M. Segal, M.D.

Holtom-Garrett Professor of Neurology
Director, University of Michigan Multiple Sclerosis Center
Director, Holtom-Garrett Program in Neuroimmunology
109 Zina Pitcher Place, SPC 2200
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Education and Training

09/80-05/84 BS *magna cum laude* in Biochemistry, Brown University, Providence, Rhode Island
07/84-06/88 MD, Brown University Medical School, Providence, Rhode Island
07/88-06/89 Intern, Internal Medicine, Pritzker Medical School, University of Chicago Hospitals, Chicago, Illinois
07/89-06/91 Resident, Neurology, Cornell University Medical Center, The New York Hospital/Memorial Sloan Kettering Cancer Center, New York, NY
07/91-06/92 Chief Resident, Neurology, Cornell University Medical Center, The New York Hospital/Memorial Sloan Kettering Cancer Center, New York, NY
06/92-05/93 Clinical Associate, Neuroimmunology Branch, NINDS, National Institutes of Health, Bethesda, MD
06/93-05/99 Research Associate, Laboratory of Immunology, NIAID, National Institutes of Health, Bethesda, MD

Certification and Licensure

1989-Present Diplomate in Medicine, National Board of Medical Examiners (361873)
1989-2014 New York State Medical Licensure (185304-1)
1993-Present Certified in Neurology, American Board of Psychiatry and Neurology (39105) (Lifetime Certification)
2007-Present Michigan State Medical Licensure (4301090951)

Academic, Administrative, and Clinical Appointments

06/93-05/97 Clinical Instructor, Department of Neurology, Georgetown University, Washington, DC
06/96-05/99 Preceptor, Howard Hughes Foundation, National Institutes of Health, Bethesda, MD
06/92-05/99 Lieutenant Commander, Public Health Service
05/99-09/04 Assistant Professor, Departments of Neurology, Microbiology and Immunology and the Cancer Center, University of Rochester Medical Center, Rochester, NY
05/99-06/07 Attending Neurologist, Departments of Neurology, Microbiology and Immunology and the Cancer Center, University of Rochester Medical Center, Rochester, NY
09/00-06/07 Affiliate, Center for Vaccine Biology and Immunology, Aab Institute of Biomedical Sciences, University of Rochester Medical Center, Rochester, NY
01/03-06/07 Director, Neuroimmunology Research, University of Rochester Medical Center, Rochester, NY
10/04-06/07 Associate Professor, Departments of Neurology, Microbiology and Immunology and

07/07-present the Cancer Center, University of Rochester Medical Center, Rochester, NY
 07/07-present Staff Neurologist, Department of Neurology, VA Ann Arbor Healthcare System, MI
 07/07-present Holtom-Garrett Professor of Neurology, University of Michigan, Ann Arbor, MI
 07/07-present Director, University of Michigan Multiple Sclerosis Center and Holtom-Garrett
 Program in Neuroimmunology, University of Michigan, Ann Arbor, MI
 09/10-present Chair, Scientific Advisory Board, VA Multiple Sclerosis Centers of
 Excellence-East

Research Interests

1. Cytokine and chemokine pathways in neuroinflammatory diseases such as multiple sclerosis and neurosarcoidosis
2. Regulatory and effector leukocytes in CNS autoimmunity
3. Mechanisms of tissue injury (demyelination and axonal transection) and repair (stem cells and axonal regrowth) consequent to neuroinflammatory insults
4. Biomarker discovery
5. Experimental therapeutics in multiple sclerosis and other neuroinflammatory disorders

Grants

Present and Active

Sponsor: Therakos, Inc.
 Title: Extracorporeal Photophoresis in Secondary Progressive MS;
 Mechanistic Studies
 PI: Benjamin M. Segal
 Total Project Period: 1/01/15-12/31/17
 Role: Principal Investigator
 Total Direct Costs: \$1,400,000

Sponsor: Genentech, Inc.
 Title: B Cell Dysregulation in Primary Progressive MS
 PI: Benjamin M. Segal
 Total Project Period: 01/2017-12/2017
 Role: Principal Investigator
 Total Direct Costs: \$99,683

Sponsor: NIH National Institute of Health
(K08 NS101054)
 Title: Role of S100A8/A9 in blood brain barrier dysfunction after sepsis
 PI: Benjamin Singer, MD, PhD
 Total Project Period: 04/2017-03/2022
 Role: Co-Investigator
 Total Direct Costs: \$977,400

Sponsor: NIH National Institute of Health
(UM 1AI110557)
 Title: University of Michigan Autoimmunity Center of Excellence, Clinical
 Research Program
 PI: David A. Fox, MD

Total Project Period: 5/01/14-4/30/19
Role: Co-Investigator
Total Direct Costs: \$350,000

Sponsor: Target Foundation
Title: Role of NK and NKT Cells in ALS
PI: Benjamin Murdock. Stephen Goutman
Total Project Period: 1/01/15-12/31/17
Role: Co-Investigator
Total Direct Costs: \$129,000

Sponsor: National Institutes of Health
(R21 NS098200)
Title: Investigation of Novel Roles for IRF7 in EAE
PI: David Irani, MD
Total Project Period: 1/01/15-12/31/17
Role: Co-Investigator
Total Direct Costs: \$426,250

Sponsor: Craig H. Neilsen Foundation
(297085)
Title: Immune mediated repair of the injured spinal cord
PI: Benjamin Segal, M.D. and Roman Giger, PhD
Total Project Period: 7/01/14-6/30/16
Role: Co-PI
Total Direct Costs: \$272,728 (includes sub-award)

Sponsor: Adelson Medical Research Foundation (AMRF)
(04-7023433)
Title: Molecular Mechanisms of Axon Directed Myelination
PI: Roman Giger, PhD
Total Project Period: 10/01/14-9/30/15
Role: Co-Investigator
Total Direct Costs: \$136,363

Sponsor: A. Alfred Taubman Medical Research Institute
Title: Taubman Scholar
PI: Benjamin Segal, MD
Total Project Period: 7/01/2014-6/30/2017
Total Direct Costs: \$450,000

Sponsor: University of Michigan Neurology
Title: Discretionary
PI: Benjamin Segal, MD
Total Project Period: N/A
Total Direct Costs: \$550,000

Major Previous Grants

Sponsor: Veteran's Administration Merit Review Award
(1101BX001387)

Title: Nogo receptors as therapeutic targets in a model of multiple sclerosis
PI: Benjamin M. Segal, MD
Total Project Period: 1/01/13-12/31/16
Role: Principal Investigator
Total Direct Costs: \$648,540

Sponsor: Biogen-Idec
(FE-12303)

Title: Multiple Sclerosis Clinical Fellowship Award
PI: Jeanie Cote, MD
Total Project Period: 07/01/14-06/30/15
Role: Mentor
Total Direct Costs: \$90,000

Sponsor: Veteran's Administration Merit Review Award
(1I01RX000416)

Title: Preclinical studies of a MADCAM-Fc fusion protein in multiple sclerosis
PI: Benjamin M. Segal, MD
Total Project Period: 04/01/11-03/31/15
Role: Principal Investigator
Total Direct Costs: \$1,101,630

Sponsor: NIH National Institute of Neurological Disorders and Stroke
(1R01NS057670)

Title: The Regulation of Myeloid Cell Development and Mobilization during Autoimmune Demyelinating Disease
PI: Benjamin M. Segal, MD
Total Project Period: 01/15/10-12/31/15
Role: Principal Investigator
Total Direct Costs: \$875,000

Sponsor: Charles A. Dana Foundation (Neuroimmunology)
(203000)

Title: Immune-mediated Axonal Repair in the Injured Adult Mammalian CNS
PI: Roman Giger, PhD
Total Project Period: 10/01/11-11/30/14
Role: Co-Investigator
Total Direct Costs: \$200,000

Sponsor: National Multiple Sclerosis Society
(RG 4229A1)

Title: X-linked Genes and Gender Bias in Multiple Sclerosis
PI: Yang Liu, PhD
Period: 10/01/11-09/30/14
Role: Co-Investigator
Total Direct Costs: \$513,088

Sponsor: Biogen-Idec
(N015948)

Title: Multiple Sclerosis Clinical Fellowship Award
PI: Jessica Stulc, MD
Total Project Period: 07/01/13-06/30/14

Role: Mentor
 Total Direct Costs: \$90,000

Sponsor: National Multiple Sclerosis Society
(FG 1985-A-1)

Title: Investigating the trafficking behavior of encephalitogenic Th17 cells prior to entering the CNS in experimental autoimmune encephalomyelitis and multiple sclerosis.

PI: Stephen Lalor, PhD
 Total Project Period: 07/1/12-06/30/13
 Role: Mentor
 Total Direct Costs: \$169,946

Sponsor: National Multiple Sclerosis Society **(CA 1037A1/1)**
 Title: Multiple Sclerosis Collaborative Research Center Award
 PI: Benjamin M. Segal, MD
 Total Project Period: 04/01/06-03/31/12
 Role: Principal Investigator
 Total Direct Costs: \$713,330

Sponsor: The Dana Foundation
 Title: Th17 Polarization and CNS Trafficking in Multiple Sclerosis
 PI: Benjamin M. Segal, MD
 Total Project Period: 10/01/07-09/30/10
 Role: Principal Investigator
 Total Direct Costs: \$200,000

Sponsor: National Multiple Sclerosis Society **(RG 3866-A-3)**
 Title: Myeloid Cell Expansion, Mobilization and Differentiation during EAE
 PI: Benjamin M. Segal, MD
 Total Project Period: 10/01/06-09/30/10
 Role: Principal Investigator
 Total Direct Costs: \$337,117

Sponsor: NINDS-NIH **(R01 NS047687)**
 Title: Lymphoid Chemokines in Autoimmune Demyelination
 PI: Benjamin M. Segal, MD
 Total Project Period: 08/01/04-06/30/09
 Role: Principal Investigator
 Total Direct Costs: \$822,718

Sponsor: National Institute of Allergy and Infectious Diseases-NIH
(U19 AI056390)

Title: The IL-12p40 Family of Monokines in Secondary Progressive Multiple Sclerosis (Autoimmunity Center of Excellence, Project 2)

PI: Ignacio Sanz, MD
 Total Project Period: 09/30/03-03/31/09
 Role: Principal Investigator of Project 2
 Total Direct Costs: \$800,064 (Project 2)

Sponsor: NIAID-NIH (**U19 AI056362**) – Subaward 001C
Title: Effects of anti-IL12 on Cytokine, Chemokine and Adhesion Pathways in Multiple Sclerosis
PI: Benjamin M. Segal, MD
Total Project Period: 09/30/03-03/31/09
Role: Principal Investigator
Total Direct Costs: \$677,689 (Subaward)

Sponsor: Centocor, Inc.
Title: The Role of IL-12 and IL-23 in Experimental Optic Neuritis
PI: Benjamin M. Segal, MD
Total Project Period: 11/28/05-02/28/07
Role: Principal Investigator
Total Direct Costs: \$74,686

Sponsor: Serono, Inc. (**Independent Medical Grant**)
Title: The Effects of Recombinant Beta-Interferon on the Cytokine/Chemokine Repertoire in Patients with Relapsing-Remitting Multiple Sclerosis: A Longitudinal, Dose Comparison Study
PI: Benjamin M. Segal, MD
Total Project Period: 08/01/04-07/31/06
Role: Principal Investigator
Total Direct Costs: \$200,000

Sponsor: National Multiple Sclerosis Society (**Harry Weaver Junior Faculty Award**)
Title: The Role of IL-12 during the Effector Phase of Experimental Allergic Encephalomyelitis (EAE)
PI: Benjamin M. Segal, MD
Total Project Period: 07/01/00-06/30/06
Role: Principal Investigator
Total Direct Costs: \$375,000

Sponsor: NINDS-NIH (**R01 NS41562**)
Title: Cytokine Regulation of Mature Myelin-Specific T Cells in Autoimmune Encephalomyelitis
PI: Benjamin M. Segal, MD
Total Project Period: 06/01/01-04/30/06
Role: Principal Investigator
Total Direct Costs: \$500,000

Clinical Trials and Studies

Current

Title: Extracorporeal Photophoresis in Secondary Progressive MS
Sponsor: Therakos, Inc.
Role: PI

Title: Th1/Th17 immunity in Progressive and Relapsing Remitting MS

Sponsor: Dana Foundation
Role: PI

Title: Care MS I and II (Alemtuzumab)
Sponsor: Genzyme
Role: Site PI

Title: A Phase 2, open-label, dose escalation study evaluating the safety, tolerability and pharmacodynamics of intravenously administered MIS416-201 in patients with chronic progressive multiple sclerosis
Sponsor: Innate Therapeutics
Role: Member, Safety Review Team

Completed

Title: A Randomized, Multicenter, Placebo-Controlled and Active Reference (Glatiramer Acetate) Comparison Study to Evaluate the Efficacy and Safety of BG00012 in Subjects with Relapsing Remitting MS

Sponsor: Biogen Idec
PI: D. Mikol
Role: Primary Treating Neurologist

Title: C0743T06: A Phase 2, Double-Blinded, Placebo-Controlled, Randomized, Dose-Ranging Study of Multiple Subcutaneous Injections of Human Monoclonal Antibody to IL-12p40 (CNTP 1275) in Subjects with Relapsing-Remitting Multiple Sclerosis

Sponsor: Centocor
PI: B. Segal
Role: Overall PI

Title: Effects of Anti-IL12 on Cytokine, Chemokine, and Adhesion Pathways in Multiple Sclerosis

Sponsor: NIH
PI: B. Segal
Role: Overall PI

Title: Randomized, Double-Blind, Placebo-Controlled, Multi-Center Study to Evaluate the Efficacy and Safety of Atorvastatin in Patients with Clinically Isolated Syndrome and High Risk of Conversion to Multiple Sclerosis

Sponsor: NIH
PI: S. Zamvil
Role: Laboratory Coordinator and Sub-Investigator

Title: Phase II/III, Randomized, Double-Blind, Parallel-Group, Placebo-Controlled, Multicenter Study to Evaluate the Safety and Efficacy of Rituximab in Adults with Primary Progressive Multiple Sclerosis

Sponsor: Genentech
PI: H. Panitch
Role: Sub-Investigator

Title: The EVIDENCE Trial: Randomized, Comparative Study of Interferon β -1a Treatment Regimens in MS

Sponsor: Serono International

PI: D. Mikol
Role: Sub-Investigator and Examining Neurologist

Title: A Phase 3 Randomized, Rater and Dose-Blinded Study Comparing Two Annual Cycles of Intravenous Low- and High-Dose Alemtuzamab to Three-Times Weekly Subcutaneous Interferon Beta-1a in Patients Who Have Relapsed on Therapy. CAMM324

Sponsor: Genzyme
PI: B. Segal
Role: Site PI

Honors and Awards

1980 Wriston Prize for Excellence in Undergraduate Chemistry
1984 Graduated with the distinction of *summa cum laude*
1988 Stanley Aronson Award for Excellence in the Clinical Neurosciences
1988 AOA
1988 Distinguished as top 10% of Medical School Class
1991-1992 Chief Resident in Neurology, The New York Hospital
1999 PHS Commendation Medal, NIAID, NIH
2000 Bushwell Fellowship Award
2000 Harry Weaver Neuroscience Junior Faculty Award, National Multiple Sclerosis Society
2001 Brain Tumor Society Investigator Award
2002 American Association of Immunologists Junior Faculty Travel Award
2003 ACTRIMS/ECTRIMS 2002 Impact Presentation Award
2006 Elected to Henry Kunkel Society (Honorary Society of Immunologists)
2006 Excellence in Research Award, University of Rochester School of Medicine
2007 Holtom-Garrett Professorship in Neurology, University of Michigan
2010-2013 Chair, Scientific Advisory Board, VA Multiple Sclerosis Centers of Excellence-East
2011-Present Named to "Best Doctors in America" list
2011 Visiting Scholar, Neuroinflammation Training Program, McGill University/ Universite de Montreal
2012 Keynote Speaker, First Annual Multiple Sclerosis Symposium, University of California Multiple Sclerosis Research Center
2013 Inaugural Key Note Speaker, Neuroimmunology Lecture Series, Washington University in St. Louis
2014-present Co-Chair, NINDS/NIH Study Section, CNBT
2014-present Co-Chair, Program Committee, Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS)
2014-2015 Chair, Federation of Clinical Immunology Societies (FOCIS)-ACTRIMS Satellite Symposium
2014-2017 Taubman Senior Scholar, A. Alfred Taubman Medical Institute, University of Michigan
2014 Inducted into League of Research Excellence, University of Michigan
2016-2018 Chair, Program Committee, ACTRIMS
2017 2nd Annual Steven R. Schwid Lectureship in Multiple Sclerosis, University of Rochester

Memberships in Professional Societies

1990-present	American Academy of Neurology
1999-present	American Association of Immunologists
2005-present	American Neurological Association (Fellow as of 2012)
2006-present	Elected Member, Henry Kunkel Society (Honorary Society of Immunologists)
2013	American Medical Association

Editorial Positions, Boards, and Peer-Review Service

Guest Editor

2015	Clinical Immunology, Special Edition
2017	MS Journal, Special Edition

Section Editor

2012	Current Treatment Options in Neurology
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Associate Editor

2013-present	Journal of Immunology
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Manuscript Reviewer

1997-present	Cellular Immunology
1997-present	Proceedings of the National Academy of Sciences
1998-present	Clinical Immunology and Immunopathology
1998-present	Immunopharmacology
1998-present	Neurology
1999-present	Journal of Immunology
1999-present	Journal of Neuroimmunology
1999-present	Brain, Behavior and Immunity
1999-present	The Journal of Experimental Medicine
2002-present	Journal of Clinical Investigation
2006-present	The Lancet Neurology
2010-present	Nature Immunology
2012-present	Nature

Scientific (Grant) Reviewer

10/2002	NINDS/NIH Study Section, NSC-D, Bethesda, MD
2002-2010	Multiple Sclerosis Society of Canada
2002-present	The Wellcome Trust, Research Career Development Fellowships
2003-2005	NINDS/NIH Study Section, Special Emphasis Panel
02/2005	NINDS/NIH Study Section, NST, Bethesda, MD
2005-2011	National Multiple Sclerosis Society, Scientific Study Section
02/2006	NINDS/NIH Study Section, CNBT
03/2008	NINDS/NIH Study Section, NSD-C
04/2008	American Neurological Association 133 rd Annual Meeting, Neuroimmunology Block, <i>Abstract Reviewer</i>
06/2009	NINDS/NIH Study Section, NSD-C
07/2009	NIH, BDCN N02 Member Conflict Panel, AED Review
08/2009	Multiple Sclerosis Research Australia

08/2009	Department of Veterans Affairs Cooperative Studies Program
05/2010	Immune Tolerance Network
2010-2013	Association pour la Recherche sur la Sclerose En Plaques
07/2010	NINDS/NIH Special Emphasis Panel ZRG1 BDCN-W
09/2012	Deutsche Forschungsgemeinschaft (German Research Foundation)
07/2012-present	Clinical Neuroimmunology and Brain Tumors (CNBT) Study Section, NIH, Chartered Member
02/2013	Fast Forward Scientific Review Committee, National Multiple Sclerosis Society
02/2013	Aging and Neurodegenerative Diseases panel, US Department of Veterans Affairs RR&D Service Winter Merit Review Session
02/2013	Federal Organization of Clinical Immunologic Societies, Abstract reviewer
06/2013	NINDS/NIH Study Section, CNBT (Charter Member)
02/2014	NINDS/NIH Study Section, CNBT (Charter Member)
06/2014	Veterans Affairs Office of Research and Development, Neurobiology B panel
10/2014	NINDS/NIH Study Section, CNBT (Co-Chair)
02/2015	NINDS/NIH Study Section, CNBT (Co-Chair)
10/2015	NINDS/NIH Study Section, CNBT (Co-Chair)
09/2015-present	Abstract reviewer, ACTRIMS
10/2015	Abstract reviewer, American Association of Neurology
06/2016	NINDS/NIH Study Section, CNBT

Teaching/ Mentorship

Residents and Medical Students

2000-2007	Attending Physician, Neurology Resident Firm, University of Rochester Medical Center, Rochester, NY
2007-2015	Attending Physician and Chief, Resident Multiple Sclerosis Clinic, University of Michigan, Ann Arbor, MI, ½ day per week
2007-present	Attending Physician and Chief, Neuroimmunology Clinic, Ann Arbor VA Hospital, Ann Arbor, MI, ½ day per week
2007-present	Attending Physician, Neurology Ward, University of Michigan, Ann Arbor, MI, 4 weeks/ year

Postdoctoral Fellows

1999-2001	Hiroshi Ichikawa, PhD
2000-2006	Ludmila Bagaeva, PhD
2007-2009	Karthik Venkatesh, PhD
2002-2012	Praveen Rao, PhD
2008-2013	Julie Rumble, PhD
2008-2010	Tiffany Braley, MD (Clinical Fellow)
2011-2012	Vessela Mateeva-Giger, MD PhD (Clinical Fellow)
2010-2013	Stephen Lalor, PhD
2011-2014	Amanda Huber, PhD
2014-2015	Sergei Chuikov, PhD
2011-2015	Kevin Carbajal, PhD

Multiple Sclerosis Clinic Fellows

2005-2007	Lahar Meta, MD
2008-2010	Tiffany Braley, MD
2011-2012	Vessela Mateeva-Giger, MD PhD
2012-2015	Robert Pace, MD

2013-2014 Jessica Stulc, MD
2014-2015 Jeannie Cote, MD

PhD Students

2002-2007 Pratima Deshpande, Microbiology and Immunology
2002-2007 Thaddeus Carlson, Microbiology and Immunology (MSTP MD/PhD Program)
2003-2008 Irah King, Neurosciences
2004-2009 Mark Kroenke, Microbiology and Immunology
2009-2014 Heather Grifka-Walk, Immunology
2011-2016 Josh Stoolman, Immunology
2012-present David Giles, Immunology (MSTP MD/PhD Program)
2012-present Patrick Duncker, Immunology

Postdoctoral Research Advisory Committee

2009-2012 Emily Rainey-Barger, PhD, Fellow in Neurology
2012-present Benjamin Singer, MD, Fellow in Internal Medicine

Dissertation Committees

- Xiawen Wang, PhD candidate, Microbiology and Immunology Program, University of Rochester, Rochester, NY (Mentor: Timothy Mosmann, PhD)
- Jen Snyder, PhD candidate, Microbiology and Immunology Program, University of Rochester, Rochester, NY (Mentor: Timothy Mosmann, PhD)
- Antonia P. Eyssallenne, MD/PhD Program, Cancer Biology and Immunology, University of Rochester, Rochester, NY (Mentor: Faith Young, MD)
- Ernest Wang, PhD candidate, Microbiology and Immunology Program, University of Rochester, Rochester, NY (Mentor: Alexandra Livingstone, PhD)
- Steven Bauer, PhD candidate, Pathology (Tumor Immunity), University of Rochester, Rochester, NY (Mentor: Maurice Zauderer, PhD)
- Shoshana Katzman, PhD candidate, Microbiology and Immunology, University of Rochester, Rochester, NY (Mentor: Deborah Fowell, PhD)
- Solomon Shaftel, MD/PhD Program, Neurosciences, University of Rochester, Rochester, NY (Mentor: Kerry O'Banion, MD, PhD)
- Paula Zschoche, PhD candidate, Microbiology and Immunology Program, University of Rochester, Rochester, NY (Mentor: Andrea Sant, PhD)
- Michelle Janelins, PhD candidate, Neuroscience, University of Rochester, Rochester, NY (Mentor: Howard Federoff, MD, PhD)
- Laurie Robaks, MD/PhD candidate, Neuroscience, University of Rochester, Rochester, NY (Mentor: Roman Giger, PhD)
- Kevin Yang Ji, PhD candidate, Microbiology and Immunology, SUNY Upstate Medical University (Mentor: Andy Hurwitz, PhD)
- Tim Welliver, PhD candidate, Microbiology and Immunology, Preliminary Exam Committee, University of Michigan
- Matthew Klinker, PhD candidate, Microbiology and Immunology, Preliminary Exam Committee, University of Michigan (Mentor: Steve Lundy, PhD)
- Michael Mashiba, PhD candidate, Immunology, Preliminary Exam Committee, University of Michigan (Mentor: Kathleen Collins, MD, PhD)
- Nathan Matthews, PhD candidate, Immunology, University of Michigan (Mentor: Pavan Reddy, MD)
- Heather Walk, PhD candidate, Immunology, University of Michigan
- Joel Crespo, PhD candidate, Immunology, University of Michigan
- (Mentor: Weiping Zou, MD, PhD)

- Josh Stoolman, PhD candidate, Immunology, University of Michigan
- Patrick Duncker, PhD candidate, Immunology, University of Michigan
- David Giles, PhD candidate, MSTP and Immunology, University of Michigan
- Jessica Chen, PhD candidate, Neuroscience, University of Michigan
- Sayed Alireza Hassani Najafabadi, Pharmaceutical Science, University of Michigan

Masters Degree Students

2008-2009	Stephanie Coomes, Neuroscience, University of Michigan
2008-2010	Ashley Sandy, PIBS, University of Michigan
2007-2009	Heather Grifka, Microbiology and Immunology, University of Michigan

Undergraduate Student Mentor

2001-2002	Kathy Aligene, University of Rochester
2008-2009	Kylie Hill, University of Michigan
2012-2014	Lisa Le, University of Michigan
2012-2014	Deven Kalkarni, University of Michigan
2013-2014	Justin Ulrich-Lewis, University of Michigan

Intramural Courses

1999-2007	Neurology Residents' Lecture Series, University of Rochester, Rochester, NY
1999-2007	Immunology (MBI-473), Graduate Program in Immunology, Microbiology and Vaccine Biology, University of Rochester, Rochester, NY
1999-2007	Neurobiology of Neurological Disease (NSC-525), Graduate Program in Neurosciences, University of Rochester, Rochester, NY
2000-2007	Cancer Biology (PTH-507), Graduate Program in Molecular Oncology and Cancer Biology, University of Rochester, Rochester, NY
2001-2007	Integrated Systems B Course, School of Medicine, University of Rochester, Rochester, NY
2002-2007	Scientific Reasoning in Medicine, Course for MD/PhD Program, University of Rochester, Rochester, NY
2003-2007	Pathways to Human Disease (PTH-493), Graduate Program in Pathology, University of Rochester, Rochester, NY
2004-2007	Neuroinflammation (ANA-513), University of Rochester, Rochester, NY
2009-2013	Immunology 851, Graduate Program in Immunology, University of Michigan, Ann Arbor, MI
2009-2014	Neuropathology and Translational Neuroscience (NS602), Graduate Program in Neuroscience, University of Michigan, Ann Arbor, MI
2013	PIBS 503 Course, Fraud, Fabrication and Plagiarism

Intramural Lectures

- "Immunobiology of multiple sclerosis I", Invited Speaker, Feldman Lab Meeting, University of Michigan, September 28, 2007
- "Halting inflammation in multiple sclerosis", Invited Speaker, Program in Biomedical Sciences, University of Michigan, October 26, 2007
- "Evolution of neuroinflammation during the course of multiple sclerosis: Implications for stage-specific therapy", Neurology Grand Rounds, University of Michigan, February 20, 2008
- "Pathogenesis of multiple sclerosis I", Residents' Lecture, Department of Neurology, University of Michigan, March 10, 2008
- "Pathogenesis of multiple sclerosis II", Residents' Lecture, Department of Neurology, University of Michigan, March 17, 2008
- "Insights into the Causes of Multiple Sclerosis: The Interface between Inflammation and

Neurodegeneration”, Invited Speaker, Neuroscience Program Retreat, University of Michigan W.K. Kellogg Biological Station, September 19, 2008

- UM MS Patient and Caregiver Conference, Department of Neurology, University of Michigan, October 1, 2008
- “Secondary Progressive Multiple Sclerosis: New insights into the role of B cells, the meninges and the origin of oligoclonal bands”, Grand Rounds, Department of Neurology, University of Michigan, December 17, 2008
- “Is multiple sclerosis a syndrome rather than a disease? The prospect of distinct Th1, Th17 and non-Th1/Th17 forms of autoimmunity”, Department of Pathology Research Seminar Series, University of Michigan, January 29, 2009
- “Mechanisms of MS”, Residents’ Lecture, Department of Neurology, University of Michigan, November 17, 2009
- “Novel MS Therapeutics: Translation from Bench to Bedside”, Society of Biology Students, University of Michigan, December 3, 2009
- “Secondary Progressive MS”, Patient Conference, Department of Neurology, University of Michigan, December 16, 2009
- “Clinical Studies in the UM Multiple Sclerosis Center”, Clinical Research Conference, Department of Neurology, University of Michigan, April 21, 2010
- “Autoimmune Diseases of the Central Nervous System: The interplay between adaptive and innate immunity”, Department of Microbiology & Immunology Seminar Series, January 20, 2011
- UM MS Patient and Caregiver Conference, Department of Neurology, University of Michigan, August 18, 2012
- “Multiple Sclerosis: Current Therapeutic Approaches, Mechanistic Insights and Biomarkers”, University of Michigan Annual Symposium in MS Research, October 26, 2012.
- UM MS Patient and Caregiver Conference, Department of Neurology, University of Michigan, August 17, 2013
- “Targeting the Innate Immune System for the Treatment of Relapsing and Progressive Forms of Multiple Sclerosis”, Grand Rounds, Department of Neurology University of Michigan, November 11, 2015

Committee, Organizational, and Volunteer Service

Institutional

1999-2007	Member, Neurology Residency Steering Committee, Department of Neurology, University of Rochester, Rochester, NY
1999-2007	Member, Clinical Advisory Board, Multiple Sclerosis Society Upstate New York Chapter
2000-2007	Member, Selection Committee, MD/PhD Program, University of Rochester, Rochester, NY
2004-2007	Director and Founder, Neuroimmunology and Neuroregeneration Research Interest Group, University of Rochester, Rochester, NY
2007-present	Organizer, Neuroimmunology Lecture Series, University of Michigan
2008-present	Member, Immunology Preliminary Exam Committee, Graduate Program in Immunology, University of Michigan
2008-present	Member, Executive Advisory Committee, Department of Neurology, University of Michigan
2008-present	Member, Appointments, Promotions and Awards Committee, Department of Neurology, University of Michigan
2008-2015	Judge, Neuroscience Day Poster Session and Platform Presentations, Department of Neurology, University of Michigan
2009-present	Member, Training Grant Executive Committee, Department of Neurology, University of Michigan

- 2010-present Member, Preliminary Examination Committee, Graduate Program in Immunology, University of Michigan Medical School
- 2013 Member, Michigan Institute for Clinical & Health Research Clinical Trials Office Advisory Committee

Regional

- 2007-present Member, Clinical Advisory Board, Multiple Sclerosis Society, Michigan Chapter

National

- 2007-2010 Scientific Advisory Board, National Multiple Sclerosis Society
- 2009 Symposium Organizer, "Lymphoid Neogenesis, Grey Matter Pathology & Repair Pathways: Implications for Secondary Progressive Multiple Sclerosis", University of Michigan, Ann Arbor, MI, June 4-5, 2009
- 2010 Symposium Organizer, "Emerging Concepts in the Neuroimmunological and Neurodegenerative Aspects of Multiple Sclerosis", University of Michigan, Ann Arbor, MI, September 29-30, 2010
- 2010 Moderator, Think Tank, "Progressive MS", National Multiple Sclerosis Society, Boston, MA
- 2010-present Chair, Research Advisory Committee, VA Multiple Sclerosis Centers of Excellence- East
- 2013 Symposium Organizer, "Early events in lesion formation during Multiple Sclerosis: Mechanisms by which T cells access the CNS", University of Michigan, September 20, 2013.
- 2013 Co-Chair Special Interest Group Symposium – Multiple Sclerosis, ANA 2013 Annual Meeting, New Orleans, LA, October 13-14, 2013
- 2013 Symposium Organizer, "Inflammation-induced axonopathy: Insights into the neurodegenerative aspects of Multiple Sclerosis", University of Michigan, November 7-8, 2013.
- 2012-present Charter Member, CNBT study section, NIH
- 2014-present Co-Chair, NINDS/NIH Study Section, CNBT
- 2014 Co-Chair, Special Interest Group Symposium – Multiple Sclerosis, ANA 2014 Annual Meeting, Baltimore, MD, October 12-14, 2014
- 2014-2016 Co-Chair, Program Committee, Americas Committee for Treatment & Research in Multiple Sclerosis (ACTRIMS) 2015 Forum
- 2014-2015 Chair, Federation of Clinical Immunology Societies (FOCIS)-ACTRIMS Satellite Symposium, June 24, 2015
- 2015-present Member, Advisory Committee, ACTRIMS
- 2016-2018 Chair, Program Committee, Americas Committee for Treatment & Research in Multiple Sclerosis (ACTRIMS) Forum
- 2016 Member, External Advisory Committee, University of Alabama Multiple Sclerosis Center

Consulting Positions

- 2000-2010 Scientific Research Liaison Division, Teva Pharmaceuticals
- 2004-2007 Clinical Trial Advisory Committee, Centocor
- 2000-2007 Vaccinex, Inc.
- 2009-2011 Medarex Inc.
- 2009-2011 Clinical Trial Advisory Committee, Cladribine, EMD Serono
- 2009-2013 Innate Therapeutics Limited

2010-2012	Biogen IDEC
2010-present	Novartis
2011-2013	Lypanosis, Ltd.
2011-present	Bristol Myers-Squibb
9/2012	MS Experts Consensus Summit: Freedom From MS Disease Activity, Mellen Center, Cleveland Clinic
11/2012	Biogen-Idec, Daclizumab HYP Consultant Meeting
06/2105	Best Doctors, Inc.
06/2015	Vitae Pharmaceuticals, Inc.

Visiting Professorships, Seminars, and Extramural Invited Presentations

- “T helper cell/antigen presenting cell interactions in autoimmunity”, Invited Speaker, Keystone Symposium on *Macrophage Activation and Deactivation: Links Between Innate and Adaptive Immunity*, Keystone, CO, January 2001
- “Activation of antigen presenting cells via toll-like receptor 9 or CD40 reverses tolerance and precipitates CNS autoimmunity”, Invited Speaker, Experimental Biology, New Orleans, LA, April 2002
- “IL-12 dependent/ IFN gamma independent expression of CCR5 by myelin-reactive CD4+ T cells correlates with encephalitogenicity”, Invited Speaker, ACTRIMS-ECTRIMS, Baltimore, MD, September 2002
- “Interleukin 12 receptor and CD40 ligand in CNS autoimmune disease”, Invited Speaker, The Upstate New York Immunology Conference, Sagamore, NY, November 2003
- “Th1 polarization occurs in the CNS, not the periphery, during CNS autoimmunity”, Platform Presentation, Experimental Biology, Washington, DC, April 2003
- “Cytokine and chemokine dysregulation in autoimmune demyelination”, Invited Speaker, John Whittaker Memorial Lecture, The 18th annual meeting of the Consortium of Multiple Sclerosis Centers, Toronto, Canada, June 2004
- “The roles of interleukin-12 and 23 in multiple sclerosis”, Invited Speaker, Plenary Session, FOCIS Centers of Excellence Trainee Satellite Symposium, 12th International Congress of Immunology and 4th Annual Congress of FOCIS, Montreal, Canada, July 2004
- “CNS chemokines, cytokines and dendritic cells in autoimmune demyelination”, Invited Speaker, The Science of Myelin, A Symposium of the Society for Experimental Neuropathology, American Neurological Association, Toronto, Canada, October 2004
- “CXCL13 in autoimmune demyelinating disease”, Invited Speaker, America’s Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS), Ninth Annual Meeting, Toronto, Canada, October 2004
- “Recent insights into the immunopathogenesis of multiple sclerosis and novel immunomodulatory strategies”, Invited Speaker, Lowenthal Conference on Neurological Disorders, Virginia Commonwealth University, Richmond, VA, March 2006
- “Immunopathogenesis of MS”, Invited Speaker, Department of Neurology, UCLA, Los Angeles, CA, May 2006
- “Lymphoid chemokines in neuroinflammation”, Invited Speaker, Grand Rounds, Department of Neurology, University of Michigan, Ann Arbor, MI, September 2006
- “Leukocyte trafficking and cytokine/chemokine networks in neuroinflammation: The pursuit of novel treatment strategies in multiple sclerosis”, Invited Speaker, Grand Rounds, Department of Neurology, University of Pittsburgh, Pittsburgh, PA, January 2007
- “GM-CSF triggers accelerated myelopoiesis during EAE”, Invited Speaker, Keystone Symposium: Intracellular and Intercellular Signaling in Dendritic Cell Function, Keystone, CO, March 2007
- “CXCL13 is a target for treatment of autoimmune disease”, Invited Speaker, Biogen Inc., Cambridge, MA, April 2007

- “Th17 cells in experimental autoimmune encephalomyelitis and multiple sclerosis: Are they the *genuine* pathogenic effectors in autoimmune inflammation?” Invited Speaker, Immunology Symposium, University of California, Irvine, Irvine, CA, April 2007
- “Neuroinflammation in MS: Novel interactions between leukocytes, cytokines and the blood-brain-barrier”, Invited Speaker, Plenary Lecture (Whitaker Track), 21st Annual Meeting of the Consortium of Multiple Sclerosis Centers, Washington, DC, June 2007
- “The diagnosis and management of relapsing-remitting and secondary progressive multiple sclerosis”, Invited Speaker, *University of Alabama*, Birmingham, AL, October 22, 2007
- “The IL-23/IL-17 pathway and CNS inflammation in multiple sclerosis”, Visiting Professor, Neurology Grand Rounds, University of Alabama, Birmingham, AL, October 23, 2007
- Case Presentation, Visiting Professor, Residents’ Conference, University of Alabama, Birmingham, AL, October 23, 2007
- “Inflammation and neurodegeneration: The debate over the underlying cause of tissue injury in multiple sclerosis”, Invited Speaker, Annual Meeting and Volunteer Recognition Luncheon, National Multiple Sclerosis Society Michigan Chapter, Troy, MI, November 10, 2007
- “Ectopic germinal centers: Relevance to MS therapies”, Platform Speaker, Biogen National Faculty Scientific Meeting, Miami, FL, February 9, 2008
- “The role of the innate immune system in active regulation of CNS autoimmunity”, Invited Speaker, American Association of Immunologists Annual Meeting, San Diego, CA, April 6, 2008
- Regulatory Influences on CNS Autoimmune Disease, Co-Chair, American Association of Immunologists Annual Meeting, San Diego, CA, April 6, 2008
- “Chemokine and cytokine pathways in acute and chronic autoimmune neuroinflammation”, Invited Speaker, Boehringer Ingelheim, New York, NY, July 11, 2008
- “Your MS Drugs: Information to Help you Understand”, Invited Speaker, Something for Everyone Conference, National Multiple Sclerosis Society Michigan Chapter, Novi, MI, September 6, 2008
- “Lymphoid Chemokines and Tertiary Lymphoid Structures in Autoimmune Demyelinating Disease”, Invited Speaker, Multiple Sclerosis and the Military Experience Directors and Coordinators Meeting, Veterans Affairs MS Center of Excellence East, Baltimore, MD, September 9, 2008
- “The Multiple Faces of CNS Autoimmune Disease: Distinct Roles of Th1/Th17 Pathways in Inflammatory Demyelination”, Invited Speaker, Beth Israel Deaconess Medical Center, Boston, MA, September 15, 2008
- “Discussion Surrounding a Treatment for Today’s RRMS Patient”, Invited Speaker, Battle Creek Neurology, Battle Creek, MI, September 29, 2008
- “The Evolution of Immune Dysfunction during the Course of MS”, Invited Speaker, Serono Home Office, Boston, MA, October 3, 2008
- “New Insights into the Etiology of Secondary Progressive MS”, Invited Speaker, Neurology/Rehabilitation Grand Rounds, Michigan State University, Lansing, MI, October 22, 2008
- “Cytokine Networks that Regulate Myeloid Cell Trafficking and Differentiation in CNS Autoimmunity”, Invited Speaker, 9th International Congress of Neuroimmunology, Fort Worth, TX, October 27, 2008
- Dendritic Cells in Neuroimmunology, Session Chair, 9th International Congress of Neuroimmunology, Fort Worth, TX, October 27, 2008
- “Immunotherapy in Multiple Sclerosis”, Invited Speaker, University of California, Los Angeles, CA, November 19, 2008
- “Novel Concepts in the Pathogenesis of Progressive Multiple Sclerosis”, Invited Speaker, Neurology Grand Rounds, University of Toledo, Toledo, OH, March 26, 2009
- “Research Update”, Invited Speaker, International Organization of MS Nurses, St. Mary’s of Michigan, Saginaw, MI, April 25, 2009
- “Subsets of Autoimmune Demyelinating Disease Defined by Different Types of Immune Dysregulation”, Invited Speaker, 23rd Annual Meeting of the Consortium of Multiple Sclerosis

- Centers, Atlanta, GA , May 29, 2009
- “Clinical Aspects of Secondary Progressive MS”, Round Table Discussion, Lymphoid Neogenesis, Grey Matter Pathology & Repair Pathways: Implications for Secondary Progressive Multiple Sclerosis, University of Michigan, June 4, 2009
- “Meningeal Lymphoid Neogenesis in Secondary Progressive Multiple Sclerosis”, Lymphoid Neogenesis, Grey Matter Pathology & Repair Pathways: Implications for Secondary Progressive Multiple Sclerosis, University of Michigan, June 4, 2009
- “New Concepts Regarding the Immunopathogenesis of Secondary Progressive MS”, Invited Speaker, VA MS Centers of Excellence Conference, August 12, 2009
- “CXC Chemokines in Autoimmune Demyelination”, Invited Speaker, Medarex Inc., Del Mar, CA, August 25, 2009
- “MS: Pathologically Homogeneous or Heterogeneous Disease?” Invited Panel Speaker, VA Centers of Excellence MS Symposium, Baltimore, MD, September 14, 2009
- “The Role of Th17 Cells in MS”, Invited Speaker, Immunology and Disease Modifying Therapies for Multiple Sclerosis: Assessment of Scientific Needs, Medical Affairs Advisory Board, Chicago, IL, October 3, 2009
- “MS and EAE as Heterogeneous Diseases”, Invited Speaker, New York University, New York, NY, October 5, 2009
- “Distinct pathways for CNS trafficking based on Th subset phenotype”, Invited Speaker, Chemokines and Chemokine Receptors in the CNS Workshop, Rome, Italy, October 22, 2009
- “Heterogeneous Immune Mechanisms Underlying Multiple Sclerosis”, Invited Speaker, Neuroimmunology Seminar Series, Johns Hopkins University, Baltimore, MD, December 1, 2009
- “Immune Dysregulation in Multiple Sclerosis: Cross-sectional and Longitudinal Diversity”, Invited Speaker, Grand Rounds, University of Chicago, Chicago, IL, December 11, 2009
- “The Th1/Th17 Paradigm in Multiple Sclerosis”, Invited Speaker, Research Forum Distinguished Lecture, Oklahoma Medical Research Foundation, Oklahoma City, OK, January 21, 2010
- “What Makes a T Cell Encephalitogenic?” Invited Speaker, Neuroimmunology Seminar Series, University of Virginia, Charlottesville, VA, May 3, 2010
- “Multiple Sclerosis Subsets and Customized Therapy”, Invited Speaker, Neurology Grand Rounds, Department of Neurology and Neuroscience at New York Presbyterian Hospital-Weill Cornell Medical Center, New York, NY, May 19, 2010
- “Myeloid cells and their growth factors as novel therapeutic targets in autoimmune demyelinating disease”, Visiting Scholar Lecture Series, Neuroinflammation Training Program, Montreal Neurological Institute/ McGill University, Montreal, Canada, April 1, 2011
- “Novel pathogenic T cells in an experimental model of MS”, Invited Speaker, Autoimmunity: FASEB Summer Research Conference, Saxtons River, VT, July 10- 5, 2011.
- “Granulocyte and Monocyte Related Factors as Novel Therapeutic Targets in CNS Autoimmune Disease”, Invited Speaker, 5th International Conference on Autoimmunity: Mechanisms and Novel Treatments, Aegean Conference Series, Hersonissos, Crete, Greece, September 23-28, 2011.
- “Heterogeneity in the Immunopathogenesis of Multiple Sclerosis: Observations in Animal Models and Clinical Studies”, Invited Speaker, Department of Neurology, Mount Sinai School of Medicine, New York, NY, October 6, 2011.
- “Treatment of Multiple Sclerosis: Current advances and future prospects”, Invited speaker, 16th Annual Fannie & Charles Penikoff Research Symposium, Illinois Chapter, National Multiple Sclerosis Society, October 28, 2011
- “Pathogenic pathways and therapeutic targets in Multiple Sclerosis”, Bristol-Myer Squibb Advisory Board Meeting, New York, New York, December 16, 2011.
- “Th1/Th17 immune dysregulation in Multiple Sclerosis: Insights from the bench and clinic.” Kenneth R. Wilske Lecture Series in Science and Medicine, Benaroya Research Institute, Seattle, WA, January 9, 2012.

- “Myeloid Cells in Multiple Sclerosis: An Unexpected Role of the Innate Immune System in Autoimmune Demyelinating Disease” Invited Speaker, Immunology Institute Seminar Series, Mount Sinai School of Medicine, New York, NY, February 14, 2012.
- “The Clinical Efficacy of Disease Modifying Therapy in Progressive Multiple Sclerosis”, Multiple Sclerosis Center of Excellence Research Advisory Conference, Baltimore MD, March 9, 2012
- “Monocytes and granulocytes as effector cells in CNS autoimmune disease”, Invited Speaker, Northwestern University School of Medicine, Chicago, Illinois April 16, 2012
- “A Role of the Innate Immune System in the Pathogenesis of CNS Demyelinating Disease: Monocytes and Granulocytes as Therapeutic Targets in MS “ Keynote Speaker, Annual Multiple Sclerosis Symposium, University of California Multiple Sclerosis Research Center, Irvine, CA, April 24, 2012
- “Th1/Th17 cytokine dysregulation during different stages of multiple sclerosis”, Invited Speaker, , Federation of Clinical Immunology Societies (FOCIS) 2012, Vancouver, B.C., June 16-23, 2012
- “The Th1/Th17 paradigm in EAE and MS”, Invited Speaker, FASEB Conference on Translational Neuroimmunology: From Mechanisms to Therapeutics, Carefree, AZ, July 30, 2012
- “Immune Dysregulation in Relapsing and Progressive MS”, Invited Speaker, Paralyzed Victims of America Summit 2012, Las Vegas, NV, August 29, 2012.
- “The Bone Marrow-Blood-Brain Connection in Autoimmune Neuroinflammation”, Invited Speaker, Department of Neurosciences Lecture Series, Cleveland Clinic, September, 2012.
- “Multiple Sclerosis as a syndrome with diverse immunopathologies: Implications for Disease Modifying Therapy”, Invited Speaker, University of Pennsylvania, January 8, 2013.
- “Diversity in the phenotype of encephalitogenic T cells: Multiple Sclerosis as a heterogeneous syndrome”, Inaugural Speaker, Center for Neuroimmunology and Neuroinfectious Diseases (CNND) Seminar Series, Washington University School of Medicine in St. Louis, January 22, 2013.
- “Current Status and Future Directions of Disease modifying Therapies in Multiple Sclerosis”, Plenary Speaker, American Chemical Society National Meeting, New Orleans, LA, April 8, 2013.
- “The immunopathogenesis of Multiple Sclerosis: Implications for Candidate Therapeutic Targets”, Invited Speaker, Novartis, East Hanover, NJ, April 29, 2013.
- “The Immunopathogenesis of Autoimmune Demyelinating Disease: Lessons Learned from Mice and Men”, Invited Speaker, Multiple Sclerosis Symposium: Clinical and Immunological Concepts, University of Alabama, May 15, 2013.
- “Immune Dysregulation in Secondary Progressive MS”, Invited Speaker, Paralyzed Victims of America Summit 2013, Orlando, FL, August 27, 2013.
- “Myeloid cells in Relapsing and Progressive Stages of MS: Clues from Animal Models and Clinical Studies”, Invited Speaker, 6th International Conference on Autoimmunity: Mechanisms and Novel Treatments, Aegean Conference Series, Corfu, Greece, October 2-7, 2013.
- “The Relative Importance of Th1, Th17 and ex-Th17 Cells in Multiple Sclerosis and EAE: Revising the Dogma”, Invited Speaker, NINDS/NIH Grand Rounds, April 15, 2014.
- “Cross-talk between the acquired and innate immune systems during the evolution of multiple sclerosis”, Invited Speaker, Mayo Clinic, August 7, 2014.
- “Pathogenic T-Cells”, Plenary Speaker, 12th International Congress of Neuroimmunology, Mainz, Germany, November 11, 2014
- “Candidate Biomarkers and Therapeutic Targets in Progressive Multiple Sclerosis”, Invited Speaker, SPMS Symposium, Bristol-Myers Squibb, Princeton, NJ, December 2, 2014
- “The roles of Th1, Th17 and exTh17 cells in MS pathogenesis”, Invited Speaker, 40 Years of Neuroimmunology, the Cumming Foundation, Warrenton, Virginia, April 19-20, 2015
- "Pathogenic and Pro-regenerative Roles of Myeloid Cells in CNS Injury", Invited Speaker, Neurology Grand Rounds and CNND Spring Seminar, Washington University, St. Louis, MO, May 8, 2015
- “CNS Autoimmune Disease and the Innate Immune System: Novel Roles of Pro-inflammatory and Regulatory Myeloid Cells”, Chair, ACTRIMS-FOCIS Symposium, San Diego, CA, June 24, 2015

- “Secondary Progressive Multiple Sclerosis: Pathogenesis and Treatment”, Invited Speaker, Paralyzed Veterans of America Summit 2015, Jacksonville, FL, September 1, 2015
- “Targeting the Innate Immune System for the Treatment of Relapsing and Progressive Forms of Multiple Sclerosis”, Invited Speaker, University of Utah, Salt Lake City, UT, September 14, 2015
- “The Immunopathogenesis of Multiple Sclerosis: Insights from Clinical Studies and Animal Models”, Invited Speaker, Montana State University, Bozeman, MT, September, 22, 2015
- “Paradoxical Roles of Myeloid Cells in Central Nervous System Injury and Repair”, Invited Speaker, I3T Immunology Forum Seminar Series, UCLA School of Medicine, Los Angeles, CA January 26, 2016
- “Innate Immunity in Multiple Sclerosis Relapse and Progression”, Invited Speaker, Grand Rounds, Thomas Jefferson University, Philadelphia, PA March 25, 2016.
- “Inflammation Driven Neurodegeneration: An unexpected role of a novel Neutrophil Subset”, Invited Speaker, Neuroscience Seminar, Case Western Reserve University, September 22, 2016.
- “Immunopathologies of Relapsing versus Progressive Multiple Sclerosis: clues for novel biomarkers and Therapeutic Targets, Immunopathologies of Relapsing versus Progressive Multiple Sclerosis: clues for novel biomarkers and Therapeutic Targets, September 23, 2016.
- “Innate Immunity in MS Progression”, Invited Speaker, External Advisory Board Meeting, University of Alabama MS Center, Birmingham, AL October 9, 2016.
- “The evolution of neuroinflammation during the course of CNS autoimmune disease.” Invited Speaker, University of Connecticut, January 19, 2017.
- “The evolution of neuroinflammation during the course of CNS autoimmune disease.” Invited Speaker, Grand Rounds, University of California Davis, February 7, 2017.
- “Granulocyte-Macrophage Colony-Stimulating Factor Drives Chronic Disability in Autoimmune Demyelinating Disease”, Chair, ACTRIMS-FOCIS Symposium, Orlando, FL February 24, 2017.
- “Immune mediated neurorepair” Invited Speaker, Chalk Talk, McGovern medical School, Houston, TX, March 20, 2017.
- “The Immune Basis of Multiple Sclerosis: Implications for Current and Future Disease Modifying Therapy”, Invited Speaker, Department of Neurology 2nd Annual Lectureship in Multiple Sclerosis, University of Rochester Medical Center, Rochester, NY, April 21, 2017.
- “The relative importance of Th1 and Th17 cells in MS” Invited Speaker, 2017 Consortium of Multiple Sclerosis Centers Annual Meeting, New Orleans, LA, May 26, 2017.
- “Debates Over Controversies in MS”, Panelist, 2017 Consortium of Multiple Sclerosis Centers Annual Meeting, New Orleans, LA, May 25, 2017.
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Patents

Lymphoid Chemokines in the Diagnosis, Monitoring and Treatment of Inflammatory Disease (B.M. Segal, *et al.*), US Utility Patent Application No. 11/119,333, Issued April 29, 2004

Blockade of ELR+ CXC Chemokines as a Treatment for Inflammation and Autoimmune Disease (B.M. Segal, *et al.*), US Utility Patent Application No. 60/64,323, Issued Jan. 4, 2005

Bibliography (selected articles)

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2. Voskuhl RR, Robinson ED, **Segal BM**, Tranquill L, Camphausen K, Albert PS, Richert JR, McFarland HF. HLA Restriction and TCR usage of T Lymphocytes specific for a novel candidate autoantigen, X2 MBP, in multiple sclerosis. *J Immunol* 1994;153(10): 4834-4844.
3. **Segal BM**, Shevach EM. IL-12 unmasks latent autoimmune disease in resistant mice. *J Exp*

- Med 1996;184(2): 771-775. PMID: PMC2192714.
4. **Segal BM**, Klinman DM, Shevach EM. Microbial products induce autoimmune disease by an IL-12 dependent pathway. *J Immunol (Cutting Edge)* 1997;158(11): 5087-5090.
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 6. **Segal BM**, Dwyer B, Shevach EM. An IL-12/IL-10 immunoregulatory circuit controls susceptibility to autoimmune disease. *J Exp Med* 1998;187(4): 537-546. PMID: PMC2212155.
 7. **Segal BM**, Shevach EM. The straight talk on immune deviation. *Clin Immunol Immunopathol* 1998;88(1): 1-3.
 8. **Segal BM**. The comeback of the elusive "suppressor" cell: An update on the regulatory network in EAE. *Res Immunol* 1998;149(9): 811-820.
 9. Shevach EM, Chang JT, **Segal BM**. The critical role of IL-12 and the IL-12R β 2 subunit in the generation of pathogenic autoreactive Th1 cells. *Springer Semin Immunopathol* 1999;21(3):249-262.
 10. Chang JT, Shevach EM, **Segal BM**. Regulation of IL-12 receptor β 2 subunit expression by endogenous IL-12: A critical step in the differentiation of pathogenic autoreactive T cells. *J Exp Med* 1999;189(6):969-978. PMID: PMC2193042.
 11. **Segal BM**, Cross AH. Fas(t) track to apoptosis in MS: TNF receptors may suppress or potentiate CNS demyelination. *Neurology*, 2000;55(7): 906-907.
 12. Chang JT, **Segal BM**, Nakanishi K, Shevach EM. The costimulatory effect of IL-18 on the induction of antigen-specific interferon- γ production by resting T cells is IL-12 dependent and is mediated by upregulation of the IL-12 receptor β 2 subunit. *Eur J Immunol* 2000;30(4): 1113-1119.
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 14. **Segal BM**, Chang JT, Shevach EM. CpG oligonucleotides are potent adjuvants for the activation of autoreactive encephalitogenic T cells in vivo. *J Immunol* 2000;164: 5683-5688.
 15. **Segal BM**, Shevach EM. The role of cytokines and resistance to organ specific autoimmune disease. In *Cytokines and Autoimmune Diseases*, VJ Kuchroo, N Sarvetnick, DA Hafler, Editors. 2001, Humana Press Inc.: Totowa, NH.
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 17. Ichikawa H, Williams LP, **Segal BM**. Activation of antigen presenting cells through CD40 or Toll-9 receptors overcomes tolerance and precipitates autoimmune disease. *J Immunol* 2002;169: 2781-2787.
 18. Schwid SR, Covington M, **Segal BM**, Goodman AD. Fatigue in multiple sclerosis: Current understanding and future directions. *J Rehabil Res Dev* 2002;39(2): 211-224.
 19. Panitch H, Goodin DS, Francis G, Chang P, Coyle PK, O'Connor P, Monaghan E, Li D, Weinshenker B, (**Segal BM**, examining neurologist). Randomized, comparative study of interferon β -1a treatment regimens in MS. The EVIDENCE trial. *Neurology* 2002;59(10): 1496-1506.
 20. **Segal BM**. Experimental autoimmune encephalomyelitis: Cytokines, effector T cells, and antigen-presenting cells in a prototypical Th1-mediated autoimmune disease. *Curr Allergy Asthma Rep* 2003;3(1): 86-93.
 21. Bagaeva L, Williams LP, **Segal BM**. IL-12 dependent/IFN γ independent expression of CCR5 by myelin reactive T cells correlates with encephalitogenicity. *J Neuroimmunol* 2003;137(1-2): 109-116.
 22. Rao P, **Segal BM**. Experimental autoimmune encephalomyelitis. *Methods Mol Med* 2004;102: 363-375.

23. **Segal BM.** CNS chemokines, cytokines, and dendritic cells in autoimmune demyelination. *J Neurol Sci* 2005;228(2): 210-214.
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(**Note:** This article was featured in the *Research Highlights* section of *Nature Reviews Immunology* (Volume 8, August 2008) and the *Discoveries in Neuroscience* section of *Annals of Neurology* (August 2008).
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