Curriculum Vitae

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Place of Birth: Buenos Aires, Argentina

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Education

1999	Diploma in Biology	Molecular Biology	Buenos Aires University, Argentina
2003	Ph.D.	Immunology (Prof. Cohen)	The Weizmann Institute of Science, Israel

Postdoctoral Training

2004	Research Fellow	Autoimmunity (Prof. Cohen)	The Weizmann Institute of Science
2005-2007	Research Fellow	Neuroimmunology (Prof. Weiner)	Brigham and Women's Hospital

Faculty Academic Appointments

2007	Instructor	Neurology	Harvard Medical School
2010	Assistant Professor	Neurology	Harvard Medical School
2013	Associate Professor	Neurology	Harvard Medical School
2014	Visiting Professor	Immunology	Federal University of Sao Paulo, Brazil (non-voting)
2017	Honorary Professor	Immunology	Freiburg University, Germany (non-voting)

Appointments at Hospitals/Affiliated Institutions

2007	Research Associate	Neurology	Brigham and Women's Hospital
2010	Associate Scientist	Neurology	Brigham and Women's Hospital
2013	Scientist	Neurology	Brigham and Women's Hospital
2015	Associate Member	Immunology	Broad Institute

Other Professional Positions

2015-	Scientific Advisory Board	Teva Pharmaceuticals	4 days per year
2015-	Scientific Advisory Board	BluePrint Medicines	1 day per year
2017-	Scientific Advisory Board	Quest Diagnostics	2 day per year
2017-	Scientific Advisory Board	Merck Research Laboratories	1 day per year
2016-	Founder and Scientific Advisor	AnTolRx	2 days per month

Major Administrative Leadership Positions

Local

2016-	Course Director, Autoimmunity 301	HMS

National

2013-	Topic Chair, Basic MS Immunology	Consortium of MS Centers Meeting

International

2014-	Course co-Director, Autoimmunity	Federal University of Sao Paulo, Brazil
2016-	International Advisory Board Member	International Society of Neuroimmunology
2017-	Scientific Committee Member	International Meeting on AHR, France
2017	Co-organizer	International Meeting on the Immunological Homunculus, Israel

Committee Service

Local

2011	Thesis Defense Committee for Ade Adamson	Harvard-MIT HST Member
2013-	Pre-Clinical Models Program	BWH-BRI Member
2013-	Infectious and Immunological Diseases (IID) Research Center	BWH-BRI Member
2013-	Neurosciences Research Center (NRC)	BWH-BRI Member
2016-	Dissertation Advisory Committee for Janice Nieves-Bonilla	HMS-DMS
2016-	Research Oversight Committee	BWH-BRI Member

National

2015	Promotion Committee for Fan Pan	Johns Hopkins University School of Medicine, Baltimore, MD
2015	Board of Scientific Counselors	NINDS, NIH

International

2017	Promotion Committee for Jan Lundeman	University of Zurich, Zurich, Switzerland

Professional Societies

2003	American Association of Immunologists	Member
2004	International Society of Neuroimmunology	Member
2006	American Association for the Advancement of Science	Member
2011	American Association of Neurology	Member
2012	PsychoNeuroImmunology Research Society	Member
2016	American Society of Neurochemistry	Member

Grant Review Activities

2009	Scientific Review Group ZRG1 IMM-E(58)	NIH, Ad-hoc Reviewer
2009	Scientific Review Group ZRG1 IDM-Q(53)	NIH, Ad-hoc Reviewer
2010	Scientific Grant Review	Italian Multiple Sclerosis Society, Ad-hoc Reviewer
2010	Scientific Grant Review	Israel Science Foundation, Ad-hoc Reviewer
2010	Scientific Grant Review	Multiple Sclerosis Research Australia, Ad-hoc Reviewer
2010	Scientific Grant Review	Science Foundation Ireland, Ad-hoc Reviewer
2011-2015	Scientific Grant Review	Juvenile Diabetes Research Foundation, Ad-hoc Reviewer
2011	Scientific Grant Review	Ministry of Science of Israel, Ad-hoc Reviewer
2011	Scientific Grant Review	Binational Science Foundation US-Israel, Ad-hoc Reviewer
2011	Scientific Grant Review	National Multiple Sclerosis Society, Ad-hoc Reviewer
2012	Scientific Grant Review	Italian Multiple Sclerosis Society, Ad-hoc Reviewer
2012	Scientific Grant Review	National Multiple Sclerosis Society, Ad-hoc Reviewer
2012-2016	Hypersensitivity, Autoimmunity and Immune Mediated Diseases	NIH, Permanent Study Section Member
2012-2017	Scientific Grant Review	Wellcome Trust Peer Review College, UK, Permanent Member
2013-2017	Pilot Immunology Grants	National Multiple Sclerosis Society, Permanent Member
2013-2017	Senior Grant Review	Crohn's and Colitis Foundation of America, Ad-hoc Reviewer
2013	Scientific Grant Review	National Science Centre, Poland, Ad-hoc Reviewer
2014-	Scientific Grant Review	Israel Science Foundation
2016-	Scientific Grant Review	Juvenile Diabetes Research Foundation, Chair
2017-	Scientific Grant Review	European Research Council, Reviewer

Editorial Activities

Ad Hoc Reviewer

Science, Cell, Nature Medicine, Nature Immunology, Nature Biotechnology, Nature Neuroscience, Immunity, Neuron, Proceedings of the National Academy of Sciences, Trends in Immunology, Trends in Molecular Medicine, Nature Communications, Cell reports, Journal of Clinical Investigation, The Journal of Experimental Medicine, Annals of Neurology, Science Signaling, Brain, Journal of Immunology, European Journal of Immunology, Journal of Leukocyte Biology, Proteomics, PLoS Pathogens, PLoS ONE, Journal of Proteomic Research, International Immunology, BMC Medical Genomics, Environmental Health, Therapeutic Advances in Gastroenterology, International Journal of Immunopathology and Pharmacology, Current Medicinal Chemistry, Clinical Chemistry and Laboratory Medicine, Immunology, Pharmacogenomics, Metabolism, Scandinavian Journal of Immunology.

Other Editorial Roles

2012	Editorial Board Member	Systems Biomedicine
2012	Editorial Board Member	Inmunologia (Spain)
2013-	Associate Editor	Immunology (UK)
2013-	Senior Editorial Board Member	American J. of Clinical and Experimental Immunology
2014-	Advisory Board Member	Seminars in Immunopathology

Honors and Prizes

1998-1999	Scholarship	Buenos Aires University	Outstanding Research
1999	Scholarship from the President of Argentina	Ministry of Education	Outstanding Student
1999	Antorchas Foundation Scholarship	Antorchas Foundation	Outstanding Research
2002	Young Investigator Award	Euroworkshop on Animal Models	Outstanding Research
2003	Young Researcher Award	Meeting on Translational Research in Autoimmunity, Italy	Outstanding Research
2004	Lady Anne Chain Prize for Academic Excellence and Scientific Achievements	The Weizmann Institute of Science	Outstanding Research
2005	Long-term fellowship	Human Frontiers of Science Program	Outstanding Research
2008	Junior Investigator Award	National MS Society	Outstanding Research
2008	Travel Award	Federation of Clinical Immunology Societies (FOCIS)	Outstanding Research
2009	Pathway to Independence Award	NIH/NIAID	Research
2009	Award for Outstanding Research Achievement	Nature Biotechnology	Outstanding Research
2010	Travel Award	Federation of Clinical Immunology Societies (FOCIS)	Outstanding Research
2010	Harvard Catalyst PFDD	Harvard Catalyst	Outstanding Research
2011	Tecan Award	Tecan	Innovation
2014	Harry Weaver Award	National MS Society	Outstanding Research
2015	Killam Lecture	McGill University, Canada	Outstanding Research
2015	Research Scholar Award	American Cancer Society	Research
2016	Young Mentor Award	Harvard Medical School	Research Mentor
2017	Milestones in Research Award	National MS Society	Outstanding Research in MS

Report of Funded and Unfunded Projects

Funding Information

Past

2005-2008 *Experimental Autoimmune Encephalomyelitis In Zebrafish*
Human Frontiers of Science Organization Long-term fellowship LT00782/2005-L
PI
The goal of this study was to develop a model of multiple sclerosis in zebrafish.

2009-2012 *Central Nervous System Autoimmunity And Immunoregulation In The Zebrafish*
NIH (NIAID) 1K99/R00 AI075285-01A2
PI
The goal of this study was to identify transcription factors controlling immunity.

2010-2012 *Role Of The Transcription Factor AHR In Human Regulatory T Cells*
HMS Diversity and Community Partnership Faculty Fellowship
PI
The goal of this project was to study the role of AHR in the control of human T cells.

2010-2012 *Induction Of Antigen-Specific Regulatory T Cells By Oral Administration Of Non-Toxic AHR Ligands And Insulin With Nanoparticles*
Boston Area Diabetes Endocrinology Research Center
PI
The goal of this study was to develop nanoparticles that activate AHR signaling to induce insulin-specific regulatory T cells and arrest autoimmune diabetes.

2012 *Immunomodulation For The Treatment Of Experimental Autoimmunity*
National Multiple Sclerosis Society Pilot Grant
PI
The goal of this study is to study the therapeutic potential for MS of AHR in T cells.

2011-2013 *Discovery & Development Of Tolerogenic Nanoparticle Delivery Systems*
Juvenile Diabetes Research Foundation
PI
The goal of this study is to use nanoparticles to treat autoimmune diabetes.

2009-2013 *Role of the Transcription Factor AHR in Controlling Foxp3/Treg Induction and EAE*
National Multiple Sclerosis Society
PI
The goal of this study is to evaluate the value of AHR as a therapeutic target for MS.

2012-2014 *Quantifying The T-Cell Receptor Repertoire In Zebrafish During An Immune Challenge*
US-Israel Binational Science Foundation
PI
The goal of this study is to use zebrafish to study the TCR repertoire in vertebrates.

2012-2013 *Role Of Ahr In Experimental Colitis Driven By The Innate And Adaptive Immunity*
Harvard Digestive Diseases Center
PI
The goal of this study is to investigate the role of AHR in inflammatory bowel disease.

2013 *A Zebrafish Model Of Neurodegeneration-Induced Astrocyte Activation*
BWH Institute of Neuroscience
PI
The goal of these studies is to develop new zebrafish models to study astrocytes.

2013 *Harnessing The Homing Potential Of Monocytes To Deliver Sensors And Drugs To Inflamed Regions Of The Brain*
BWH Institute of Neuroscience
Co-PI with Dr. Karp
The goal of this study is to develop methods to deliver sensors and drugs to the CNS.

2013-2014 *Environmental Control Of Very Early Inflammatory Bowel Disease*
Harvard Institute of Translational Immunology/Helmsley Trust
Co-PI with Dr. Hauser
The goal of these studies is to identify regulators of gut inflammation using zebrafish.

2013-2015 *Effects Of Fingolimod On Progressive EAE*
Novartis Pharmaceutical Corporation
PI
The goal of this study is to analyze the effects of S1P1R modulation on progressive MS.

2013-2015 *Effects of Mesenchymal Stem Cells on EAE*
Sanofi Inc
Co-PI with Dr. Karp
The goal of this study is to analyze the effects of mesenchymal stem cells on MS.

2013-2016 *Role of IL-27 signaling in dendritic cells on the development of EAE*
National Multiple Sclerosis Society
PI
The goal of this study is to analyze the effects of IL-27 on dendritic cells during MS.

2011-2016 *Mechanisms Of The Induction Of Oral Tolerance*
NIH R01 Research Grant
Weiner PI, Quintana Key Personnel (Collaborator)
In this study I contribute my experience with AHR to evaluate its role in oral tolerance.

2009-2014 *Biomarkers Study*
EMD Serono
Weiner PI, Quintana Key Personnel (Collaborator)
In this study I apply my experience to evaluate antigen microarrays as MS biomarkers.

2012-2015 *Predictors of the Response to Gilenya for Multiple Sclerosis in the CLIMB Study.*
Novartis Pharmaceutical Corporation
Chitnis PI, Quintana Key Personnel (Collaborator)
In this study I contribute my experience to evaluate antigen microarrays as to monitor the response to Gilenya in Multiple Sclerosis.

2014-2016 *Role and Therapeutic Value of AHR in Inflammatory Macrophages during GBM*
NIH R21 Research Grant
PI
In this study we investigate the role of AHR signaling in GBM

2014-2015 *Sphingolipid metabolism as a therapeutic target for secondary progressive MS*
International Progressive MS Alliance
PI
In this study we evaluate the value of Miglustat as a therapy for progressive MS.

2015 Sphingolipid metabolism as a therapeutic target for neurodegeneration
Private Donor Funding
PI
In this study we evaluate the repurposing of drugs targeting for progressive MS

2015-2016 *Development of a drug discovery pipeline for secondary progressive MS*
International Progressive MS Alliance
PI
In this study we established a pipeline to develop new therapies for progressive MS.

Current

2011-2017 *Role Of Aryl Hydrocarbon Receptor In IL-10 Producing Tr1 Regulatory Cells*
NIH R01 AI093903
PI ($1,125,000)
The goal of this study is to analyze the role of AHR on Tr1 cell differentiation.

2014-2018 *Regulation of astrocytes by environmental factors*
NMSS RG4111A1
PI ($509,665)
The goal of this study is to analyze the role of astrocytes in progressive MS.

2014-2019 *Role of Astrocytes in MS and EAE*
Harry Weaver Neuroscience Scholarship
NMSS JF2161-A-5
PI ($670,000)
In this study we analyze the role of astrocytes in MS.

2015-2018 *Regulation and function of inflammatory macrophages in GBM*
American Cancer Society
PI (660,000)
The goal of this study is to investigate the control of tumor-associated macrophages.

2015-2017 *Molecular mechanisms mediating the effects of Laquinimod*
Teva Pharmaceuticals
PI (600,000)
This study investigates the mechanisms mediating the effects of Laquinimod in MS.

2015-2017 *Control of CNS inflammation by sphingolipid metabolism*
ONO Pharmaceuticals
PI (200,000)
In this study we investigate the role of sphingolipid metabolism in astrocytes on MS.

2015-2019 *Engineered Induction of a Stem Cell Homing Response*
NIH R01 HL095722
Co-PI with Dr. Karp ($1,250,000)
In this study we investigate the therapeutic potential of engineered stem cells.

2016-2021 *Role Of AHR in DCs in the control of CNS autoimmunity*
NIH R01 ES025530
PI ($1,250,000)
In this study we investigate the role of AHR in DCs in EAE and MS.

2016-2021 *New Generation Diffussion MRI Biomarkers for Prodromal Schizophrenia*
NIH R01 MH108574
Pasternak PI, Quintana Key Personnel (Collaborator)
In this study I apply my experience to evaluate antigen microarrays as biomarkers for schizophrenia.

2016-2018 *Precision Immunotherapy for Autoimmunity and Cancer*
Adaptive Biotechnologies Corporation
PI ($500,000)
In this study we develop new personalized TCR-targeted immunotherapies.

2017-2020 *miR-29b and miR-9 target GBM via AHR and p38 network*
Israel Cancer Research Fund
Co-PI with Dr. Efroni ($450,000)
In this study we analyze by single cell RNAseq the immune response in GBM.

2017-2020 Nanotechnology-based therapy for Myasthenia Gravis
Private Donor Funding
Co-PI with Dr. Sharpe ($500,000)
In this study we will develop therapeutic nanoparticles for Myasthenia Gravis.

2017-2021 *Development of a drug discovery pipeline for progressive MS*
International Progressive MS Alliance PA-1604-08459
PI ($4,200,000)
This grant supports an international program project to develop new therapies for MS.

2017-2022 Immunomodulatory effects of bilirubin mediated by the Aryl Hydrocarbon Receptor.
NIH R01 DK108894
Longhi PI, Quintana Key Personnel (Collaborator)
In this study I apply my experience on AHR to evaluate its modulation by billirubin.

2017-2022 Regulation of CNS autoimmunity
NIH R01 AI126880
PI ($1,125,000)
In this study we investigate the role of HIF1 and AHR in immune regulation.

2017-2020 Treatment of inflammation with synthetic biotics producing AHR agonists
Synlogics Inc.
PI ($600,000)
In this study we evaluate engineered commensal bacteria as new immunotherapeutics.

2017-2022 Center of Excellence for Biomedicine (CEBM) at KACST and BWH
King Abdulaziz City for Science & Technology
Co-PI with Dr. Shah and Dr. Karp ($9,000,000)
This grant will support establishing a center to develop new therapies for neurodegeneration.

Submitted

2017-2022 *Control of local CNS inflammation*
NIH R01 NS102807
PI ($1,250,000)
In this study we investigate the regulation of astrocytes in MS.

2017-2022 *Role of the IL-27/CD39 axis in the regulation of gut inflammation*
NIH R01 DK109678
Co-PI with Dr. Robson ($2,000,000)
In this study we investigate the regulation of gut inflammation by IL-27 and CD39.

2017-2022 AHR-mediated immunosuppression in glioblastoma
NIH R01
Co-PI with Dr. Sherr ($2,000,000)
In this study we investigate the control of T cell exhaustion in glioblastoma.

Report of Local Teaching and Training

Teaching of Students in Courses

1997-1999	Biochemistry	Buenos Aires University
	Undergraduate students	6 h/week
1997-1999	Molecular Biology	Buenos Aires University
	Undergraduate students	6 h/week
1998-1999	Molecular Genetics	Buenos Aires University
	Undergraduate students	6 h/week
2011-	Molecular Signals To Understand Exposure Biology (EH 527)	Harvard School of Public Health
	Graduate students	4 h
2012-	Molecular And Translational Toxicology (PPH 713)	Harvard Medical School
	Graduate students	4 h
2014	Nanocourse Animal Models of Innate and Adaptive Immunity	2 days
	Graduate students and post doctoral fellows	Harvard Medical School
2017-	Neuroimmunology	1 Semester
	Graduate students and post doctoral fellows	4 h

Laboratory and Other Research Supervisory and Training Responsibilities

2007-2010	Supervision of research assistant (*Ann Tukpah*, now Resident in Internal medicine)/Washington University	Daily mentorship for 4 years
2009-2011	Supervision of research assistant (*Evan Burns*, now OR nurse at NYU)/BWH	Daily mentorship for 16 months
2010-2011	Supervision of research assistant (Stefanie Almendinger, now MD student)/BWH	Daily mentorship for 16 months
2010-2013	Supervision of research assistant (Meghan Nadeau, now MD student)/BWH	Daily mentorship for 16 months
2011-2013	Supervision of research assistant (Sharmila Sambanthamoorthy, now research assistant in pharmaceutical industry)/BWH	Daily mentorship for 16 months
2012-2013	Supervision of research assistant (Keith Kallas, now MD student)/BWH	Daily mentorship for 16 months
2013-2016	Supervision of research assistant (Jessica Kenison, now PhD student)/BWH	Daily mentorship for 16 months
2015-2016	Supervision of research assistant (Amihai Haimovich, now DVM)/BWH	Daily mentorship for 16 months
2016-	Supervision of research assistant (Davis Borucki/BWH	Daily mentorship for 16 months

Formally Supervised Trainees

2006-2009	*Mauricio F. Farez, MD* / Resident in Neurology, FLENI, Argentina
2009	*Andrezza Santiago, PhD* / Assistant Professor, Universidade Federal de Minas Gerais
2009-2011	*Silvio M. Viera, PhD* / Post-doctoral Fellow, Yale University

2009-2011 *Roya Rahbari, PhD* / Advanced Economic Analyst, Citizens Bank
2007-2010 *Roopali Gandhi, PhD* / Assistant Professor, Harvard Medical School
2010-2016 *Lior Mayo, PhD* / Assistant Professor, Tel Aviv University
2011-2012 *Ruxandra Covacu, PhD* / Assistant Professor, Karolinska Institute
2011-2016 *Ada Yeste, MSc* / Post-doctoral fellow, Barcelona
2012 *Miri Gordin, MSc* / Graduate Student at Bar-Ilan University
2012-2013 *Chun Cheih Chao, MSc* / Post-doctoral Fellow Harvard Medical School
2012-2015 *Ivan Mascanfroni, Ph.D* / Group leader, Abbie
2012 *Nadya Ali, MSc* / MD student at Michigan State University College
2013 *Leslie Cuellar, MSc* / Visiting scientist.
2013 *Georges Guillaume, MSc* / Visiting scientist.
2013 *Megan Rodgers, MSc* / Visiting scientist.
2013-2014 *Lukas Bunse, MD* / Post-doctoral Fellow, Heidelberg University.
2013-2014 *Swasti Barthi, MSc* / Visiting scientist.
2014-2015 *Mauricio F. Farez, MD* / Assistant Professor, FLENI, Argentina
2014-2016 *Merja Jaronen, PhD* / Assistant Professor, University of Kuoppia.
2013- *Galina Gabriely, PhD* / Post-doctoral Fellow.
2013- *Veit Rothhammer, MD*/ Post-doctoral Fellow.
2013- Maisa Takenaka, PhD / Post-doctoral Fellow.
2014- *Chun Cheih Chao, PhD* / Post-doctoral Fellow.
2016 *Isabel D'Alessandro, MSc* / Visiting Scientist
2016- *Michael Wheeler, PhD*/ Post-doctoral Fellow.
2016- *Kalil Alves da Lima, MSc* / Visiting Scientist
2017- *Andrea Barroso, MSc* / Visiting Scientist
2017- *Federico Giovanoni, MSc* / Visiting Scientist
2017- *Cristina Gutierrez Vazquez, PhD*/ Post-doctoral Fellow
2017- *Iain Clark, PhD*/ Post-doctoral Fellow
2017- *Atsushi Kadowaki, PhD*/ Post-doctoral Fellow

Local Invited Presentations

2004 *Antigen Arrays.* Lecture/Seminars in Neuroimmunology Series
Center for Neurologic Diseases, Department of Neurology, BWH
2007 *Study of MS with Antigen Arrays.* Lecture/Seminars in Neuroimmunology Series
Center for Neurologic Diseases, Department of Neurology, BWH
2008 *Regulation of CNS autoimmunity by AHR.* Lecture /Seminars in Neuroimmunology Series
Center for Neurologic Diseases, Department of Neurology, BWH
2008 S*ystems biology for the study of CNS autoimmunity.* Lecture / Systems Biology of Human Disease Conference
Harvard Medical School
2009 *Control of neurodegeneration by TLR2/PARP-1 signaling.* Lecture /Seminars in Neuroimmunology Series
Center for Neurologic Diseases, Department of Neurology, BWH
2010 *Role of AHR in Tr1 cell differentiation.* Lecture /Seminars in Neuroimmunology Series
Center for Neurologic Diseases, Department of Neurology, BWH
2011 *Control of Th22 cell differentiation.* Lecture /Seminars in Neuroimmunology Series
Center for Neurologic Diseases, Department of Neurology, BWH
2012 *Epigenetic control of Th17 cell differentiation by Aiolos.* Lecture /Seminars in Neuroimmunology Series
Center for Neurologic Diseases, Department of Neurology, BWH

2012 *Role of AHR in the adaptive immune response.* Lecture / DCP Annual Fellows Meeting BWH, Harvard Medical School

2013 *Mechanisms of CNS autoimmunity.* Lecture / Retreat of BWH Institute for Neurosciences BWH, Harvard Medical School

2013 *Regulation of the immune response by AHR signaling*. Lecture / Immunology Seminars, Program in Developmental Immunology

2013 *IL-27 signaling in DCs limits CNS inflammation*. Lecture / New England National Multiple Sclerosis Society Meeting. Harvard Medical School

2013 Induction of Th22 cells by IL-21. Lecture / Harvard Digestive Disease Center. Harvard Medical School

2014 Control of the immune response by AHR signaling. Lecture / Transplantation Research Center, Harvard Medical School.

2014 Role of AHR signaling in the regulation of mucosal inflammation. Lecture / MGH, Harvard Medical School

2014 Regulation of the immune response to GBM by AHR. Lecture / DF/BWH Neuro-Oncology Multidisciplinary Conference, Harvard Medical School.

2014 AHR as a therapeutic target for type 1 diabetes. Lecture / Joslin Diabetes Center, Harvard Medical School.

2014 Role of astrocytes in progressive MS. Seminar / Genzyme, Framingham, MA.

2014 New topics in immune regulation. Lecture / TRC, Harvard Medical School

2014 Regulation of inflammation in inflammatory bowel disease. Lecture / Harvard Institute of Translational Immunology / Helmsley Trust.

2015 Regulation of CNS inflammation. Lecture / Beth Israel Deaconess Medical Center.

2015 Immune regulation in GBM. Lecture / Dana Farber Cancer Institute.

2015 Adaptive and Innate Regulation of CNS inflammation. Seminar / Pfizer, Cambridge, MA.

2016 Control of mucosal immunity by IL-27/CD39. Lecture / Center for Virology and Vaccine

2016 *Control of CNS autoimmunity.* Presentation / Cellgene Corporation, LLC. Cambridge, MA (Sponsor: Cellgene Corporation, LLC)

2016 *Control of adaptive and innate autoimmunity.* Presentation /Synlogic. Cambridge, MA (Sponsor: Synlogic)

2016 *Immuneregulation in MS.* Presentation / Biogen. Cambridge, MA (Sponsor: Biogen)

2014 Regulation of adaptive and innate immunity. Lecture / MGH, Harvard Medical School

2017 Immune regulation by Melatonin. Sleep Grand Rounds / BWH, Harvard Medical School

2017 Regulation of CNS inflammation. Lecture / TRC, Harvard Medical School

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

Regional

2012 *Regulation of CNS autoimmunity.* Lecture / Seminars in Immunology
EMD Serono, Billerica, MA (Sponsor: EMD Serono)

2013 *Role of astrocytes in chronic CNS inflammation.* Lecture / Seminars in Immunology
EMD Serono, Billerica, MA (Sponsor: EMD Serono).

2013 *New biomarkers and therapeutic targets for MS.* Lecture / Grand Rounds Multiple Sclerosis Research Center of the University of Massachusetts
Worcester, MA

National

2008 *Study of MS with antigen arrays.* Lecture / Consortium of Multiple Sclerosis Centers Denver, CO

2008 *Regulation of CNS autoimmunity by AHR.* Lecture /Seminars in Neuroimmunology Series University of California, San Francisco, CA.

2010 *Antigen microarrays for the study of MS.* Lecture / Antigen Microarrays Symposium Fred Hutchinson Cancer Research Center, Seattle, WA

2011 *Arrest of CNS autoimmunity with non-toxic AHR ligands.* Presentation / Meeting of the American Association of Neurology.
Honolulu, HI

2011 *Regulation of adaptive immunity by AHR.* Lecture / Cicatricial Alopecia Research Symposium
Bethesda, MD

2011 *Antibody Signatures as MS biomarkers.* Lecture / Teva Biomarker Steering Committee Chicago, IL (Sponsor: Teva)

2012 *Nanoparticles for the induction of antigen-specific tolerance.* Presentation / Meeting of the American Association of Neurology.
New Orleans, LA

2012 *CNS autoimmunity.* Presentation / Kadmon Corporation, LLC.
New York, NY (Sponsor: Kadmon Corporation, LLC)

2012 *Biomarkers in MS.* **Session chair** and Lecture / Consortium of Multiple Sclerosis Centers San Diego, CA

2012 *Regulation of the immune response by AHR.* Presidential Lecture / Psychoneuroimmunology Research Society

2013 *New biomarkers and therapeutic targets for MS.* Lecture / Grand Rounds Multiple Sclerosis Research Center of New York New York, NY

2013 *Nanoparticle-based therapy for T1D.* Lecture / Antigen-specific workshop organized by Juvenile Diabetes Research Foundation New York, NY

2013 *Regulation of Th17 cell differentiation by Aiolos.* Presentation / Meeting of the American Association of Neurology. San Diego, CA

2013 *Immune effectors. Session chair / Federation of Clinical Immunology Societies. Boston, MA.*

2013 *Environmental control of MS.* **Session chair** and Lecture / Consortium of Multiple Sclerosis Centers. Orlando, FL

2013 *Control of CNS autoimmunity with nanoparticles.* Lecture / Americas Committee for Treatment and Research in Multiple Sclerosis Meeting. Orlando, FL

2013 T-cell plasticity. Session chair and Lecture / Consortium of Multiple Sclerosis Centers. Newport, RI

2013 Regulation of CNS inflammation. Lecture / University of Vermont. Burlington, VT

2014 Regulation of CNS inflammation. Lecture/La Jolla Institute for Allergy and Immunology

2014 Regulation of CNS inflammation. Lecture/University of Nebraska Medical Center, Omaha,

2014 Control of DC function by IL-27. Lecture and Symposium Chair/ Americas Committee for

2014 AHR-based mechanisms of immune regulation. Lecture/Stieffel-GSK. Durham, NC

2015 New therapeutic targets and biomarkers for MS. Lecture/Mount Sinai Medical School.

2015 Regulation of CNS inflammation by CD39. Lecture/Ohio State University. Columbus, OH

2015 Control of Tr1 cell differentiation. Lecture/ Blood Research Institute

2015 *Role of astrocytes in MS pathology.* **Session chair** and Lecture / Consortium of Multiple

2015 *Environmental control of inflammation-driven neurodegeneration.* Lecture / Elucidating

2015 Role of astrocytes in CNS inflammation. Tykeson MS Conference. Dallas, TX
2016 Pre-clinical models of progressive multiple sclerosis. Lecture / MS Consortium, Charles
2016 Control of adaptive and innate CNS inflammation. Lecture / Johns Hopkins University Baltimore, MD.
2016 Environmental control of pathology in MS. Lecture / University of Chicago. Chicago, IL.
2016 Control of astrocyte function. Lecture / American Society for Neurochemistry. Denver, CO.
2016 Mechanisms of disease pathogenesis / University of Pittsburgh School of Medicine. Pittsburgh, PA
2016 Control of CNS inflammation. Plenary lecture / American Association of Immunologists. Seattle, WA
2016 Environmental control of MS pathology. Plenary lecture / Consortium of Multiple Sclerosis Centers. Washington DC
2016 Therapeutic targets and biomarkers in MS. Lecture/Mount Sinai Medical School. New York, NY
2016 Pathogenesis of MS. Grand Rounds / Johns Hopkins. Baltimore, MD
2016 *Regulation of CNS inflammation.* Grand Rounds / University of Virginia. *Charlottesville, VA*
2017 Immune regulation in MS. Grand Rounds / University of Pennsylvania. Philadelphia, PA
2017 Regulation of CNS Inflammation. Keynote Speaker / Experimental Biology Meeting. Chicago, IL
2017 Purinergic control of T cell autoimmunity. Lecture / Experimental Biology Meeting. Chicago, IL
2017 Control of pathogenic T cells in MS by Melatonin. **Session chair** and Plenary lecture / Consortium of Multiple Sclerosis Centers. New Orleans, LA
2017 Regulation of CNS Inflammation by Environmental Factors. Lecture / 4th Biennial UAB Multiple Sclerosis Symposium. Birmingham, AL
2017 New Therapeutic Interventions in MS. Lecture/Mount Sinai Medical School. New York, NY
2017 Control of CNS Inflammation by Astrocytes. Lecture/FASEB Meeting on Autoimmunity. Saxtons River, VT

International

2003 *Regulation of autoimmunity in T1D by HSP60.* Plenary lecture / European Society for Pediatric Endocrinology Ljubljana, Slovenia
2004 *Autoantibodies and DNA vaccines in T1D.* Lecture / Hungarian Society for Immunology Budapest, Hungary
2004 *Autoantibodies and DNA vaccines for the treatment of autoimmunity.* Lecture / Roche Basel, Switzerland
2005 *Biomarkers and immunomodulation in autoimmune disorders.* Lecture / European School

of Neuroimmunology
Thessaloniki, Greece

2006 *Regulation of CNS inflammation.* Lecture / Universidad de Sevilla
Sevilla, Spain

2007 *Immunoregulation by HSP60.* Lecture / Novartis Foundation Symposium on Biology of Extracellular Molecular Chaperones
London, UK (Sponsor: Novartis)

2007 *Regulation of zebrafish immunity by FoxP3.* Presentation / Keystone Symposium on Regulatory T cells
Vancouver, CA

2007 *Regulation of adaptive immunity by AHR.* Lecture / Retreat of the Dept. of Immunology, Weizmann Institute of Science
Akko, Israel

2008 *Role of PARP-1 in chronic CNS inflammation.* Lecture / Junta de Andalucia
Sevilla, Spain

2008 *Biomarkers in MS.* Lecture / UEPHA-MS Summer School
Toulouse, France

2008 *Regulation of adaptive immunity by AHR.* Presentation / Keystone Symposium on Tolerance in Transplantation and Autoimmunity
Keystone, CO

2008 *Regulation CNS inflammation by AHR.* Presentation / Tregs and Th17 cells in Autoimmunity
Washington DC

2008 *Role of AHR in the differentiation of Tregs and Th17 cells.* Presentation / FOCIS meeting.
Boston

2010 *Role of AHR in the differentiation of Th22 cells.* Presentation / FOCIS meeting.
Boston, MA

2011 *Antibodies in MS.* **Session co-chair** and Lecture / Consortium of Multiple Sclerosis Centers
Montreal, Canada

2011 *Regulation of Tr1 cell differentiation by AHR.* Lecture / Bernhard Nocht-Institute for Tropical Medicine.
Hamburg, Germany

2011 *Pathogenesis of Multiple Sclerosis.* Keynote Lecture / Tecan
Salzburg, Austria (Sponsor: Tecan Group, LTD)

2011 *Biomarkers and disease pathogenesis in MS.* Lecture / Ibero-American Meeting in MS.
Buenos Aires, Argentina

2011 *Regulation of Tr1 cell differentiation.* Lecture / Brazilian Society of Immunology
Foz de Iguazu, Brazil

2011 *Regulation of adaptive immunity by HSPs.* Lecture / British Society of Immunology
Liverpool, UK

2012 *Study of vertebrate adaptive immunity with zebrafish.* Keynote lecture / Israeli Meeting on Zebrafish as a Model Organism for Biomedical Research
Rehovot, Israel

2012 *Regulation of CNS inflammation by AHR.* Lecture / European Charcot Foundation Symposium
Marbella, Spain

2013 *Therapeutic effects of nanoparticles on Type 1 diabetes.* Lecture / Nanoparticle Vaccine Delivery Systems for Type 1 Diabetes Symposium. Helmsley-FOCIS.
Boston, MA

2013 *New biomarkers and therapeutic targets for MS.* Keynote Lecture / Neuroexperts Meeting. Valencia, Spain (Sponsor: Novartis)

2013 *New biomarkers and therapeutic targets for MS.* Lecture / Summit Meeting in MS. Vancouver, Canada (Sponsor: Teva)

2013 *Regulation of CNS autoimmunity. Lecture / University of Sao Paulo. Sao Paulo, Brazil*

2013 *Molecular control of CNS inflammation.* Keynote Lecture / Argentinian Society of Clinical Investigation. Mar del Plata, Argentina

2014 *Immunology of Multiple Sclerosis. Lecture / Ramon y Cajal Hospital, Madrid, Spain.*

2014 *Regulation of CNS inflammation.* Keynote Lecture / Spanish Society of Immunology. Extremadura, Spain

2014 *Immune regulation.* Keynote Lecture / Argentinian Society of Immunology. Mar del Plata, Argentina

2014 *Molecular control of T cell polarization.* Lecture / University of Perugia. Perugia, Italy

2014 *Control of CNS inflammation.* Lecture / University of Barcelona. Barcelona, Spain.

2014 *Control of T-cell polarization.* Keynote Lecture /Meeting of the Spanish Network of Multiple Sclerosis Research. Bilbao, Spain.

2014 Regulation of CNS inflammation. Lecture/Killam Seminar Series, McGill University. Montreal, Canada.

2014 Role of astrocytes in progressive MS. Lecture/MS Montreal. Montreal, Canada.

2014 Control of innate and adaptive immunity in MS. Lecture/ Université Laval. Quebec, Canada.

2014 *Regulation of CNS inflammation.* Lecture / International Society of Neuro Immunology. Mains, Germany

2014 *Control of T cell Differentiation.* Lecture / Institute for Research in Biomedicine. Bellinzona, Switzerland

2014 *Regulation of CNS inflammation.* Lecture / International Society of Neuro Immunology. Mains, Germany

2015 New therapeutic targets and biomarkers for MS. Lecture/Freiburg University. Freiburg, Germany

2015 Regulation of CNS inflammation by CD39. Lecture/Hamburg Medical School. Hamburg, Germany

2015 Control of Tr1 cell differentiation. Lecture/ University of Zurich Zurich, Switzerland

2015 *Regulation of adaptive and innate immunity in MS.* Opening Lecture / International Symposium on Neuroimmunology. Tokyo, Japan

2015 *Role of astrocytes in MS pathology.* Lecture / National Institute of Neuroscience. Tokyo, Japan

2015 *Control of Tr1 cell differentiation.* Lecture /Brazilian Society of Immunology Meeting. Guaruja, Brazil

2015 *Role of astrocytes in Neurodegeneration.* Lecture / Eibsee Meeting Cellular Mechanisms of Neurodegeneration. Eibsee, Germany

2016 *Control of Autoimmune Inflammation by CD39.* Lecture / Purinergic Signaling Keystone Symposia.
Vancouver, Canada

2016 *Positive and Negative Regulators of Astrocyte-driven pathogenesis.* Lecture /Global School of Neuroimmunology.
Jerusalem, Israel

2016 *Control of CNS inflammation by astrocytes.* Lecture /International School of Neuroimmunology.
Jerusalem, Israel

2016 *Microbial control of CNS inflammation.* Lecture /International Workshop on Autoantibodies and Autoimmunity.
Kyoto, Japan

2016 *Mechanisms of disease pathogenesis and new therapeutic targets in CNS inflammation.* Seminar/National Center of Cancer Research
Madrid, Spain

2016 *Molecular control of astrocyte-driven neurodegeneration.* Lecture /Symposiun Autoinflammation Breaks Barriers
Munster, Germany

2016 *Microbial regulation of astrocyte function via AHR signaling.* Lecture /Mind, Mood & Microbes Conference
Amsterdam, Netherlands

2016 *Environmental Control of CNS Inflammation.* Lecture /Japanese Society of Immunology
Okinawa, Japan

2016 *Regulation of inflammation by AHR signaling.* Lecture / International AHR Conference.
Rochester, NY, USA.

2017 *Regulation of inflammation by hypoxia.* Lecture / Adaptations to Hypoxia in Health and Disease Keystone Symposia.
Whistler, Canada

2017 *Role of astrocytes in CNS inflammation.* Lecture / Gordon Research Conference in Neuroimmune Communication in Health and Disease.
Ventura, CA, USA

2017 *Role of astrocytes in progressive MS.* Lecture / International Progressive MS Alliance Meeting.
Washington DC, USA

2017 *Environmental control of CNS autoimmunity.* Lecture / International Meeting on the Immunological Homunculus. **Conference co-Chair**
Rehovot, Israel

2017 *T cells in CNS autoimmunity.* Lecture / European Neuroscience School of Advanced Studies.
Sienna, Italy

2017 *Role of glial cells in autoimmunity and neurodegeneration.* Lecture / European Neuroscience School of Advanced Studies.
Sienna, Italy

2017 *Search for new biomarkers and therapeutic targets in multiple sclerosis.* Keynote Lecture / VI Meeting of Neuroexperts.
Madrid, Spain

2017 *Regulation of CNS inflammation by astrocytes.* Lecture and Sesion chair / Euroglia.
Edinborough, UK

Report of Technological Activities and Other Scientific Innovations

2000 *Methods of treatment or prevention of autoimmune diseases with CpG-containing polynucleotides*
This patent describes a method for the modulation of TLR9 signaling as a therapeutic approach for autoimmune diseases.

2000 *Identifying antigen clusters for monitoring the global state of the immune system*
This patent describes the use of antigen microarrays to diagnose and monitor autoimmune diseases**.**

2002 *Treatment of arthritis by DNA-vaccines encoding heat shock proteins and a novel peptide derived from the 60 kDa heat shock protein*
This patent describes the use of DNA vaccines as a therapeutic approach to treat for rheumatoid arthritis**.**

2003 *HSP60 peptides for the treatment of arthritis*
This patent describes the use of HSP-derived immunomodulatory peptides as a therapeutic approach for rheumatoid arthritis**.**

2003 *DNA vaccines encoding heat shock proteins*
This patent describes the use of DNA vaccines as a therapeutic approach for autoimmune diseases type 1 diabetes, multiple sclerosis and rheumatoid arthritis**.**

2004 *Antigen receptor variable region typing*
This patent describes the analysis of TCR sequences to diagnose and monitor autoimmune diseases including MS

2004 *Vaccination therapy of autoimmune diseases with naked DNA encoding CD25*
This patent describes the use of DNA vaccines coding for CD25, to induce anti-ergotypic regulatory T cells as a therapeutic approach for autoimmune diseases**.**

2005 *HIV-1 gp41 fusion peptides for immunomodulation*
This patent describes the use of HIV-derived immunomodulatory peptides to treat autoimmune diseases.

2009 *Modulation of the immune response*
This patent describes the targeting of AHR with small molecules and nanoparticles to treat autoimmune diseases including MS.

2010 *Methods of Diagnosing and Treating Multiple Sclerosis*
This patent describes the analysis of lipids to monitor MS progresion and the targeting of signlaing pathways in astrocytes, microglia and macrophages as a therapeutic approach for SPMS.

2013 *Induction of tolerogenic dendritic cells with IL-27 for the treatment of autoimmune diseases*
This patent described the induction of tolerogenic DCs by pre-treatment with IL-27 and their use as a therapeutic approach for autoimmune disorders.

2013 *Regulation of astrocyte activity to control chronic CNS inflammation*
This patent described the regulation of astrocyte activity to control CNS inflammation and neurodegeneration.

2015 *Nanoparticles for the treatment of autoimmune diabetes*
This patent describes nanoparticles to treat type 1 diabetes.

2015 *Targeting of melatonin signaling for the treatment of autoimmune disease*
This patent describes targeting melatonin signaling to treat immune-mediated diseases.

2016 *Immunotherapy of Secondary Progressive Multiple Sclerosis*
This patent describes targeting signaling pathways in astrocytes to arrest

neurodegeneration in Secondary Progressive Multiple Sclerosis.

2017 *Therapeutic Modulation of Tumor Infiltrating Macrophages In Glioblastoma*
This patent describes targets for immunotherapy in Glioblastoma

2017 *Targeting of Ephrin signaling for astrocyte modulation*
This patent describes a new molecule for the modulation of astrocyte function.

2017 *AHR agonists to limit astrocyte-driven neurodegeneration*
This patent describes new agonists to activate AHR and arrest neurodegeneration.

2017 *Nanoparticles for antibody tolerization*
This patent describes nanoparticles to suppress pathogenic antibodies

Report of Scholarship

Publications (* denotes equal contribution)

Peer reviewed publications in print or other media

Research investigations

1. Lopez Bergami, P., Cabeza Meckert, P., Kaplan, D., Levitus, G., Elias, F., **Quintana, F.J.**, Van Regenmortel, M., Laguens, R. & Levin, M.J. Immunization with recombinant Trypanosoma cruzi ribosomal P2b protein induces changes in the electrocardiogram of immunized mice. *FEMS Immunol Med Microbiol* 18, 75-85 (1997).

2. Ablamunits, V., **Quintana, F.J.**, Reshef, T., Elias, D. & Cohen, I.R. Acceleration of autoimmune diabetes by cyclophosphamide is associated with an enhanced IFN-gamma secretion pathway. *J Autoimmun* 13, 383-392 (1999).

3. **Quintana, F.J.**, Rotem, A., Carmi, P. & Cohen, I.R. Vaccination with empty plasmid DNA or CpG oligonucleotide inhibits diabetes in nonobese diabetic mice: modulation of spontaneous 60-kDa heat shock protein autoimmunity. *J Immunol* 165, 6148-6155 (2000).

4. **Quintana, F.J.** & Cohen, I.R. Autoantibody patterns in diabetes-prone NOD mice and in standard C57BL/6 mice. *J Autoimmun* 17, 191-197 (2001).

5. **Quintana, F.J.**, Carmi, P. & Cohen, I.R. DNA vaccination with heat shock protein 60 inhibits cyclophosphamide-accelerated diabetes. *J Immunol* 169, 6030-6035 (2002).

6. **Quintana, F.J.**, Carmi, P., Mor, F. & Cohen, I.R. Inhibition of adjuvant arthritis by a DNA vaccine encoding human heat shock protein 60. *J Immunol* 169, 3422-3428 (2002).

7. Goldschmidt, Y., Sharon, E., **Quintana, F.J.**, Cohen, I.R. & Brandt, A. Adaptive methods for classification of biological microarray data from multiple experiments. Technical Report MCS03-071-018 (The Arthur and Rochelle Belfer Institute of Mathematics and Computer Science, 2003).

8. Mor, F., **Quintana, F.**, Mimran, A. & Cohen, I.R. Autoimmune encephalomyelitis and uveitis induced by T cell immunity to self beta-synuclein. *J Immunol* 170, 628-634 (2003).

9. **Quintana, F.J.**, Carmi, P., Mor, F. & Cohen, I.R. DNA fragments of the human 60-kDa heat shock protein (HSP60) vaccinate against adjuvant arthritis: identification of a regulatory HSP60 peptide. *J Immunol* 171, 3533-3541 (2003).

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11. **Quintana, F.J.**, Pitashny, M. & Cohen, I.R. Experimental autoimmune myasthenia gravis in naive non-obese diabetic (NOD/LtJ) mice: susceptibility associated with natural IgG antibodies to the acetylcholine receptor. *Int Immunol* 15, 11-16 (2003).

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13. Mimran, A., Mor, F., Carmi, P., **Quintana, F.J.**, Rotter, V. & Cohen, I.R. DNA vaccination with CD25 protects rats from adjuvant arthritis and induces an antiergotypic response. *J Clin Invest* 113, 924-932 (2004).

14. Mor, F., **Quintana, F.J.** & Cohen, I.R. Angiogenesis-inflammation cross-talk: vascular endothelial growth factor is secreted by activated T cells and induces Th1 polarization. *J Immunol* 172, 4618-4623 (2004).

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Narrative Report

My goal is to combine advanced genomic and proteomic tools with innovative experimental models to study the regulation of the immune response in health and disease. In order to achieve this goal, my laboratory is organized around the following research programs:

1. Role of environmental factors in disease susceptibility and pathogenesis. Complex interactions between genes and the environment control the development of immune-mediated diseases. Significant advances have been made in the study of genetic variants, but our understanding of the role of the environment on immune disease pathogenesis is limited. To address this point I developed novel zebrafish models, which identified the aryl hydrocarbon receptor (AHR), a transcription factor whose activity is regulated by pollutants, the diet, the commensal flora and endogenous metabolites as an important regulator of the immune response (Quintana et al, Nature 2008). I am a leader in the study of the role of AHR in the immune response, and have authored most of the major papers in this area. My work on AHR has guided the development of drugs to arrest brain atrophy in MS, such as Laquinimod which is now being evaluated in clinical trials in progressive MS patients. I also identified an important role for nightlenght/melatonin in immunoregulation (Farez et al, Cell 2015). I am currently using new zebrafish models, together with mouse, humanized mouse and human experimental systems, to identify additional mechanisms by which the environment regulates the immune response.

2. Regulation of the adaptive immune response. A dysregulated immune response against self-proteins causes autoimmunity. Dendritic cells (DCs) control the immune response. Using transcriptional, epigenetic and proteomic data I identified molecular pathways that regulate DC and T cell activity and identified potential targets for therapeutic intervention (Mascanfroni et al, Nature Immunology 2013; Mascanfroni et al, Nature Medicine 2015). Based on these findings I developed nanoparticles to control DCs *in vivo* and arrest autoimmunity (Yeste et al, PNAS 2012; Yeste et al, Science Signaling 2016). These nanoparticles have been licensed by AnTolRx/Pfizer and are being developed as new therapies for autoimmunity, a first clinical trial is planed for 2019. I am currently characterizing additional mechanisms involved in the regulation of DCs.

3. Regulation of the local immune response in the CNS. Astrocytes play a central role in controlling CNS inflammation and neurodegeneration. However, the mechanisms controlling astrocyte activity are mostly unknown, and no therapies are available to modulate astrocyte activity. I developed new human, mouse and zebrafish experimental models to study astrocytes and identify potential targets for therapeutic intervention (Mayo et al, Nature Medicine 2014; Covacu et al, Cell Reports 2016; Rothhammer et al, Nature Medicine 2016, Rothhammer et al, PNAS 2017, Rothhammer et al, submitted, Takenaka et al, submitted). As part of these studies I established and direct an international team of leading investigator in Neuroimmunology that was recently awarded $4,200,000 to develop new therapies for progressive MS by the International Progressive MS Alliance. One candidate drug has been licensed and a clinical trial is being designed by BWH Translational Accelerator to test it on MS patients.

In conclusion, I have published over 140 peer-reviewed articles, including 94 original research publications, and I hold investigative grants from the NIH, the National MS Society and as well as several national and foreign foundations. I direct the Autoimmunity course at HMS, and have formally mentored over 30 trainees in the field of Neuroimmunology, many of which have already established independent groups at prestigious institutions. My primary goal is to continue to investigate the regulation of the immune response to identify mechanism of disease pathogenesis and potential therapeutic targets for human immune-mediated disorders.

Website: http://brighamandwomens.org/research/labs/quintana