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EDUCATION AND TRAINING

Year	Institution	Degree
1999-2003	Brandeis University Waltham, MA Advisor: Chan Fulton Dissertation: *The role of the pentose phosphate pathway in thiamin depletion-induced apoptosis*	BS, MS, Biochemistry *summa cum laude*
2004-2010	Massachusetts Institute of Technology Advisor: K. Dane Wittrup Dissertation: *Targeting the Tight Junction: Immunotherapy of Colon Cancer*	PhD, Molecular Engineering
2010-2011	Ragon Institute of MGH, MIT, and Harvard Advisor: Galit Alter	CFAR Postdoctoral Fellow

FACULTY APPOINTMENTS

Year	Title	Institution
2003-2004	Adjunct Instructor	Department of Chemistry, College of Charleston
2011-2016	Assistant Professor	Thayer School of Engineering Dartmouth College
	2012-	Department of Microbiology and Immunology Geisel School of Medicine at Dartmouth
	2016-	Department of Chemistry
	2016-	Program in Quantitative Biomedical Sciences
2017-	Associate Professor	

HONORS AND AWARDS

Year	Recognition
2002	Phi Beta Kappa
2003	United States Goldwater Scholar
2003	Nathan O. Kaplan Prize in Biochemistry, Brandeis University
2006-2009	MIT-Portugal Fellow, Massachusetts Institute of Technology
2007-2009	Antibody Society Scholar Annual Meeting Scholarship Winner
2010-2011	Harvard University Center for AIDS Research Postdoctoral Fellow
2016	Graduate Faculty Mentoring Award, Dartmouth College Graduate Studies
2017	Finalist, Burroughs Wellcome PATH Award
2017	Amgen Young Investigator Award

SPONSORED RESEARCH

PERIOD	SPONSOR	PROJECT	ROLE	LEVEL
Completed				Thayer (Total)
2010-2011	Harvard CFAR	Phagocytic activity of antibodies in HIV-1 infection	PI	$43,424
2011-2014	BMGF (Ragon sub)	Discovery platform for inducing potent ADCC recruiting antibodies in vivo	Co-PI	$1,937,296 ($8,305,613)
2013-2015	ACR-RRF (BWH sub)	Aberrant IgG glycosylation as a mechanistic contributor to arthritis in children	PI	$42,684
2014	BMGF (Duke sub)	Introduction to GCLP Practices	PI	$1,100
2014-2015	BMGF (Duke sub)	Investigating the agreement of first principal affinity rate law models with experimental assessments of antibody effector function	PI	$2,563
2014-2015	BMGF (Duke sub)	Impact of differentially primed T cells on the glycosylation pattern of Env-specific Abs	PI	$27,000
2014-2015	NIH NIAID	Pilot Project Dartmouth Immunology COBRE	Co-I	$14,000 ($29,000)
2015-2016	BMGF (Duke sub)	Expanding IgG Fc Assessment Services	PI	$2,348,163
2015-2016	Crucell	Interactions of FlumAbs with the innate immune system through the Fc part of these anti-influenza antibodies	PI	$22,000
2015-2017	NIH NIAID (Ragon sub)	Tuning Fc-effector functions of HIV-specific antibodies	PI	$113,523
2015-2016	Munck-Pfeffercorn	Creating improved CAR T cells to treat cancer	Co-I	$50,000 ($218,214)

2015-2016	BMGF (Duke sub)	Cross Pollination Among Computational Groups	PI	$3,960
2016-2017	NIH NIAID (Ragon sub)	Demystifying the Antiviral Activity of the IgG3+ Antibody Response	PI	$172,228
2012-2016	NIH NIAID	Applying high-performance protein engineering tools to HIV immunogen design	PI	$2,137,165
		Administrative Supplement (2014-2015)	PI	$228,725
2014-2015	NIH NIAID (Ragon sub)	Tuning Fc-effector functions of HIV-specific antibodies	PI	$81,000

Active in 2018

2014-2018	BMGF	Mucosal Immunity in Polio: Dartmouth assays for Latin American Clinical Trials	Co-I	$212,000 ($1,175,386)
2014-2018	BMGF	Defining signatures of antibody responses that correlate with protection to develop down-selection criteria to guide vaccine candidate selection	Co-PI	$1,139,066 ($3,102,645)
2015-2019	VA	Combination therapy using CRISP/Cas gene editing plus human monoclonal antibodies for a functional HIV cure	Co-I	$50,000 ($1,273,244)
2016-2021	BMGF (Duke sub)	Collaboration for AIDS Vaccine Discovery Immune Monitoring Core: IgG Fc Assessment Services	PI	$2,813,842
2016-2021	NIH NIAID (Duke sub)	Bridging antibody Fc-mediated antiviral functions across human and non-human primates	PI	$1,937,296
2017-2019	Munck-Pfeffercorn	Identification and characterization of mmAbs directed against the GraS of S. Aureas	Co-I	$75,125 ($195,000)
2017-2018	NCCC pilot grant	Design strategies to optimize chimeric receptor-based therapeutics	Co-I	~$30,000 (~$300,000)
2017-2018	FluGen	Evaluation of antigen-specific human IgA responses after FluGen M2SR vaccination	PI	$22,000
2017-2021	NIH NIAID, NIGMS	Directing antibody effector activity via controlled IgG subclass switching	PI	$3,264,955
2017-2021	NIH NIAID (OHSU sub)	Using Monoclonal Antibody Fc Variants in Strategies to Eliminate HIV Reservoirs	PI	$460,212
2018-2019	IMPRINT (Southampton sub)	Unravelling maternal protection: Factors affecting transplacental transfer of antibody from mother to infant	PI	£25,000 (£87,000)

2019-2019	Munck-Pfeffercorn	New generation antibodies to prevent neonatal herpes infections	Co-PI	$78,435
2018	NIH NIAID (Profectus sub)	Fc Array Analysis of Profectus T11 Immunization Study	PI	$22,000
2015-2019	WHO	Enteric Immunity Generated by Inactivated Polio Vaccines	Co-I	$45,000
2018-2020	NIH-NIGMS	Engineering immunogens to focus the immune response on broadly-neutralizing dengue epitopes	Co-I	$100,000 ($100,000)
2018-2019	Hitchcock Foundation	Characterization of Viral Antibodies in Human Colostrum	Co-I	($39,600)
2019	IMPRINT (Imperial sub)	The human placental perfusion model: advances in knowledge of maternofetal antibody transfer	PI	£21,500 (£70,000)
2018-2023	NIH-NIGMS	COBRE Center for Molecular Epidemiology	Co-I	~$25,000

Total External Funding = ~$28.8M across 36 projects, of which ~$25.8M represents support as PI or Co-PI

SCIENTISTS SUPERVISED

Postdoctoral Scientists (11)

2011-2014:	*In Vitro Evolution of HIV Envelope Variants With Enhanced Antigenicity* **Dr. Sebastian Grimm**
2012-2013:	*Application of Machine Learning Methods to Predict Antibody Activity* **Dr. Ickwon Choi**, co-Advised with Prof. Bailey-Kellogg, Department of Computer Science
2013-2015:	*Yeast Membrane Display for the Protein Evolution* **Dr. Ali Emileh**
2013-2015:	*Prediction of Antibody Effector Function From High Content, High Throughput Biophysical Data* **Dr. Karen Dowell**, co-Advised with Prof. Bailey-Kellogg, Department of Computer Science
2014- 2017	*Computational Design of Scaffolds for the Display of Quaternary Epitopes of the HIV Envelope Protein* **Dr. Deeptak Verma**, co-Advised with Prof. Bailey-Kellogg, Department of Computer Science
2015-2016	*Computational Antibody Humanization* **Dr. Yoonjoo Choi**, co-Advised with Prof. Bailey-Kellogg, Department of Computer Science
2016-2018	*Comprehensive HIV Vaccine Profiling* **Dr. Shu Lin**

2015-2016: *Investigations of Fc Receptors*
Dr. Elizabeth Periera

2014- present: *Establishing a GCLP-Compliant Research Core*
Dr. Josh Weiner

2018- present: *Anti-drug antibody assay development*
Dr. James DiRenzo

2018- present: *Genetic Modifiers of B Cell Class Switch Recombination*
Dr. Molly Carpenter

Thayer Graduate Students (6)

Sept 2011-2016: *Developing a Quantitative Understanding of Antibody Activity*
Austin Boesch, Ph.D., Innovation Fellow Thayer School of Engineering, Strohbehn Memorial Prize

Sept 2011-2016: *Methods for High-Throughput Characterization of Humoral Immunity*
Eric Brown, Ph.D., Thayer School of Engineering

Sept 2012-2013: *Characterization of Rhesus Macaque Fc Receptors*
Ying Chan, MS, Thayer School of Engineering

Sept 2013-present: *Protein Display Technologies in Mammalian Cells*
Thach Chu, graduate student, Thayer School of Engineering

April 2015-present: *Directed Evolution for Dengue and HIV Vaccine Immunogen Design*
Jennifer Lai, graduate student, Thayer School of Engineering
Albert Cass Travel Fellowship

Sept 2016-present: *HIV Cure and Prevention via Engineered mAbs*
Benjamin Goldberg, Innovation Fellow Thayer School of Engineering

MCB Graduate Students (9)

June 2013-2015: *The Role of Antibody and Antibody Receptor Polymorphisms in Humoral Immunity*
Nana Yaw Osei-Owusu, MS, Molecular and Cellular Biology Program

June 2013-2017: *Comparative Evaluation of Antibody Humanization Methods*
Casey Hua, Molecular and Cellular Biology Program, MD/Ph.D. Program, NIH F31 Training Grant Recipient

June 2013-2017: *Multiplex Profiling and Machine Learning Models of Antibody Glycosylation*
Hao Cheng, Molecular and Cellular Biology Program

June 2015-present: *Impact of IgG Allotypic Variation*
Andrew Crowley, Molecular and Cellular Biology Program

June 2015-present: *Role of Antibody Glycosylation in Organ Transplant*
Pranay Bharadwaj, Molecular and Cellular Biology Program

June 2016-present: *Quantitative Investigation of Antibody Effector Function*
Arijit Paul, Molecular and Cellular Biology Program

June 2017-present: *Novel mAbs to combat S. Aureus infection*
Harini Natarajan, Molecular and Cellular Biology Program

Sep 2017-present: *Ab-mediated protection of the neonate from HSV infection*
Iara Backes, co-Advised with Prof. Leib, Molecular and Cellular Biology Program, MD/Ph.D.

June 2018-present: *Novel Engineering Strategies to Modify the Activity of CAR T cells*
Savannah Butler, Molecular and Cellular Biology Program

Computer Science Graduate Students (1)

May 2015-present: *Application of Machine Learning to Predict Experimental Vaccine Efficacy*
Srivamshi Pittala, co-Advised with Prof. Bailey-Kellogg, Department of Computer Science

External Graduate Students (1)

2011: *IgG Fc Glycosylation and the Elite Control of HIV-1 Infection*
Justin Eusebio, MS, Graduate Medical Sciences Program, Boston University

Rotation Graduate Students (23)

Winter 2012: *Glycosylation of Anti-Citrullinated Peptide Antibodies*
Sladjana Skopelia, Program in Experimental and Molecular Medicine

Fall 2013: *Protoplast Fusion for Mammalian Display of Protein Libraries*
Morgan Gilman, Molecular and Cellular Biology Program

Winter 2013: *Characterization of Evolved HIV Envelope Variants*
Mike Battles, Molecular and Cellular Biology Program

Summer 2014: *Standardization of Antibody Analysis Methods*
Tamutenda Chidawanyika, Molecular and Cellular Biology Program, MD/Ph.D. Program

Summer 2014: *Passive Antibody Transfers Across the Species Barrier*
Loren Schmidt, Molecular and Cellular Biology Program, MD/Ph.D. Program

Winter 2015: *Selective Enrichment of Proteins Displayed in the Yeast Cell Membrane*
Greg Ho, Department of Chemistry

Spring 2015 *Analysis of Influenza-Specific Monoclonal Antibodies*
Claire Godberson, Program in Experimental and Molecular Medicine

Summer 2015: *Profiling Fc Receptor Recognition of Influenza Antibodies*
Ronnie Zipkin, Molecular and Cellular Biology Program, MD/Ph.D. Program

Fall 2015: *Selection of Novel B7H6-Specific Antibody Fragments*
Harrison Jones, Molecular and Cellular Biology Program, MD/Ph.D. Program

Winter 2015: *Antibody Fc Domain Display and Engineering*
Marina Kirkland, Molecular and Cellular Biology Program

Spring 2016: *Selection of Novel B7H6-Specific Antibody Fragments*
Amy Bierman, Molecular and Cellular Biology Program

Spring 2016: *Engineering IgG for Transport by the Polymeric IgA Receptor*
Michelle Clay, Molecular and Cellular Biology Program

Fall 2016: *Selection of Novel NKp30 mutants for CAR T Cell Therapy*
Kaushik Saha, Molecular and Cellular Biology Program

Fall 2016: *Evaluation of Dengue Virus Vaccine-Like Particles*
Lynn Theprungsirikil, Molecular and Celular Biology Program

Fall 2016: *Analysis of Influenza-Specific Monoclonal Antibodies*
Lia Harrington, Quantitative Biological Sciences

Spring 2017: *Monomeric B7H6 expression*
Petros Vilakati, Molecular and Cellular Biology Program
Fall 2017: *Dengue virus domain III vaccine libraries*
Kathryn Schneider, Molecular and Cellular Biology Program
Fall 2017: *Effector functions of combination mAbs*
Ji-Qing Chen, Molecular and Cellular Biology Program
Fall 2017: *Production of TRAF2*
Cheng Wang, Engineering
Winter 2018: *Dengue virus domain III vaccine libraries*
Akaash Mishra, Molecular and Cellular Biology Program
Fall 2018: *Reagents to define the effect of valency on dengue virus neutralization*
Alia Sajani, Molecular and Cellular Biology Program
Fall 2018: *Correlates of protection for a gp41-virosome vaccine*
Shiwei Xu, Quantitative Biological Sciences
Winter 2019: **Kyle Morrison**, Molecular and Cellular Biology Program
Machine learning applied to antibody data

Visiting Scholars (8)

Summer 2012: *Role of HLA Genetics in Antibody Responses to HIV Infection*
Jennifer Lai, MS candidate,
University of Oxford, United Kingdom
Winter 2013: *Methods to Epitope Map Antibodies Present in Polyclonal Serum*
Luc Christian Gwom, Ph.D. candidate,
University of Yaounde, Cameroon
Fall 2014: *Impact of T Cell Priming on Antibody Activity*
Michael Storcksdieck genannt Bonsmann, Ph.D. candidate,
Ruhr-Universitat Bochum, Germany
Winter 2017: *Novel IgG Polymorphisms and Antibody Potency*
Simone Richardson, Ph.D. candidate,
National Institute of Communicable Disease, Johannesburg, South Africa
Summer 2017: *Engineered CAR T cell signaling domains*
William Law, Research Assistant,
Vaccine Research Center, NIH
Summer 2018: *Transplacental antibody transport*
William Law, student,
Geisel School of Medicine
Fall 2018: *Humoral profiling of responses to CMV infection*
Shilpee Sharma, Postdoctoral Fellow,
University of Brussels, Belgium
Winter 2019: Machine learning applied to immunological datasets
Benedicte Hejgaard, Technical University of Denmark

Undergraduate Students (29)

2011-2012: *Profiling HIV-Specific Antibodies from Infected Subjects*
Meghan Muse, Dartmouth Department of Biological Sciences
2011: *Construction of Viral Envelope Display Plasmids*
Neha Shetty, undecided

2012-2013: *High-Throughput Analysis of Poliovirus-Specific Antibodies*
Anthony Yifeng Zhao, Engineering Sciences, Presidential Scholar

2012-2014: *Molecular Recontion Properties of Pentraxins*
Maame Ofua Ofori, Undergraduate Thesis, Engineering Sciences, Presidential Scholar

2012-2014: *Enrichment of Antigenically Enhanced HIV Envelope Variants*
Weijie Lin, Engineering Sciences, Sophomore Science Scholar

2013: *Profiling Antibody Ligation of Fc Receptors*
Hunter Kappel, Engineering Sciences, Richter and Cook Scholar

2013-2015: *Profiling Antibody Responses to Vaccination*
Erica Normandin, Engineering Sciences, Presidential Scholar, Undergraduate Thesis

2013: *Flow Cytometric Analysis of Evolved HIV Envelope Sequence Variants*
Bryan Rogers, Engineering Sciences

2013: *Properties of Rhesus Macaque Antibody Subclasses*
Emily Rogers, Undecided, WISP Intern

2013: *Analysis of Antibody Fc Sequence Variants*
Mariah Reese, Engineering Sciences, WISP Intern

2013: *Methods to Isotype Rhesus Macaque Antibodies*
Madellena Thornton, Undecided, WISP Intern

2014-2015: *Construction and Evaluation of HIV Envelope Variants*
Zonia Moore, Undecided, Presidential Scholar

2014-2015 *Characterization of Human IgA and IgA Receptors*
Michaela Ledoux, Undecided, Hellman Science Fellowship, Presidential Scholar

2014-2015: *Antibody Fragment Display*
Michaela Helble, Dual Degree Student, Engineering Sciences, Thayer; Biochemistry, Bowdoin College

2015-2018: *Structural Biology of IgG3*
Cheryl Chang, Biology, WISP Intern, Sophomore Science Scholar, Junior Science Scholar, Undergraduate Thesis

2015-2016: *Experimental Evaluation of HIV Variable Loop Graft Designs*
Julio Suarez, Engineering, Undergraduate Thesis, DOF Research Award

2015-2016: *Mammalian Expression of Evolved HIV Envelope Protein Variants*
Jessica Sun, Undecided, WISP Intern, Sophomore Science Scholar

2015: *Evaluation of Antibodies in Juvenile Arthritis*
Shuoqi Chen, Engineering Sciences, FYRE Intern

2015-2017: *Yeast Membrane Display*
Prodhi Manisha, Engineering Sciences, Junior Research Scholar, Undergraduate Thesis

2016: *Engineered Antibodies to the Kell Antigen*
Haley Richards, Undecided, WISP Intern

2016-2018: *Allotypic Antibody Variation*
Holly Langley, Undecided, WISP Intern

2016-2017: *Experimental Evaluation of HIV Variable Loop Graft Designs*
Ellen Kim, Engineering, Undergraduate Thesis

2017-2018: *Protein Glycosylation Analysis*
Caroline Pennacchio, Undecided, WISP Intern

2017-present: *Antibody Allotypic Variation*
Sarishka Desai, Undecided, WISP Intern

2018-present: *Stabilizing the dengue E dimer*

Sophia Koval, Undecided, WISP Intern, Clare Booth Luce Fellow

2018: *Targeting the GraS extracellular loops*
Jacob Rozak, Undecided, FYRE Intern

2018-present: *Responses to the Dengue E Protein Domain III*
Chengzi Guo, Undecided, WISP Intern

2018: *Fc swapping of bnAbs to define mechanisms of protection*
Melanie Prakash, Undecided, Sophomore Science Scholar

2018-present: *Role of Maternal Antibody in Neonatal HSV Protection*
Kaitlyn Kelly, Undecided, WISP Intern

Visiting Undergraduate Students (4)

2014 *Computational Antibody Humanization*
Hannah Wastyk, undergraduate student,
University of Delaware, MD/Ph.D. Undergraduate Summer Internship Program,
Goldwater Scholar, NSF Graduate Fellowship

2017 *Antibody Stimulation of Neutrophils*
Mariah Sanchez, undergraduate student,
University of New Mexico, MD/Ph.D.
Undergraduate Summer Internship Program

2018 *Antibody Variants to Define Mechanisms of Action*
Adiaratou Ba, undergraduate student,
University of California, Santa Cruz, MD/Ph.D. Undergraduate Summer Internship Program

2018 *Antibody stimulation of Neutrophils*
Lorrie Blais, undergraduate student,
Saint Michael's College, ASURE
Undergraduate Summer Internship Program

High School Students (3)

2014 *Expression and Evaluation of IgG3 Variants with Extended Plasma Circulation*
Jakub Bobrowicz, Hanover, NH

2016 *Affinity Characterization of B7H6-specific Antibody Fragments*
Jennifer Clay, Somewhere, PA

2017-2018 *Alternative Scaffolds as Inhibitors of GraS*
Busara Hall, Hanover, NH

TEACHING

Full Courses

Term	Number	Title	Enrollment
Summer 2011	ENGS 25	Introduction to Thermodynamics	19
Summer 2012	ENGS 25	Introduction to Thermodynamics	35
Spring 2013	ENGS 25	Introduction to Thermodynamics	62
Fall 2013	ENGG 199	Advances in Biotechnology	4
Winter 2014	ENGS 58/163	Protein Engineering	21
	ENGG 199	Advances in Biotechnology	5
Spring 2014	ENGS 25	Introduction to Thermodynamics	40

Fall 2014	ENGG 260	Advances in Biotechnology	13
Winter 2015	ENGS 163	Advanced Protein Engineering	4
Spring 2015	ENGS 162	Methods in Biotechnology	3
	ENGS 260	Advances in Biotechnology	12
Fall 2015	ENGS 260	Advances in Biotechnology	20
Winter 2016	ENGS 163	Advanced Protein Engineering	8
	ENGG 260	Advances in Biotechnology	14
Spring 2016	ENGG 260	Advances in Biotechnology	21
Fall 2016	ENGS 260	Advances in Biotechnology	19
Winter 2017	ENGS 58/163	Protein Engineering	23
	ENGG 260	Advances in Biotechnology	20
Spring 2017	ENGS 260	Advances in Biotechnology	20
Fall 2017	ENGS 260	Advances in Biotechnology	23
Winter 2018	ENGS 58/163	Protein Engineering	17
	ENGG 260	Advances in Biotechnology	18
Spring 2018	ENGS 260	Advances in Biotechnology	18
Fall 2018	ENGS 260	Advances in Biotechnology	20
Winter 2019	ENGS 260	Advances in Biotechnology	TBD
	ENGS 58/163	Protein Engineering	TBD

Notes:

- Some offerings of ENGG 199/260 have been co-taught with Prof. Karl Griswold.
- Average teaching contribution of >3 courses/year.

Contributing Lecturer

Term	Number	Title
Spring 2012	ENGS 56	Introduction to Biomedical Engineering
Winter 2013	MICR 142	Advanced Cellular and Molecular Immunology
Winter 2013	ENGS 58/163	Protein Engineering
Winter 2015	MICR 142	Advanced Cellular and Molecular Immunology
Spring 2018	MICR 144	Cellular and Molecular Basis of Immunity

Mentor/Review Board Member

Term	Number	Role/Student
Fall 2012	ENGM 178	Faculty Advisor
Fall 2013	ENGG 390	Review Board Member
Spring 2014	ENGS 88	Maame Afua O. Ofori *Generation of Pentraxins and Characterization of Their Binding with Human Fcg Receptors*
Spring 2015	ENGS 88	Erica Normandin *Glycan-Binding Protein Engineering*
Spring 2016	ENGS 88	Julio Suarez *Improving the Immune Response towards the HIV Envelope Variable Loops Through Protein Peeling*
Spring 2017	ENGS 192	Jacob Furlon *Methods in Biotechnology*
Spring 2017	ENGS 86	Prodhi Manisha

		Evaluations of Yeast Membrane Display
Spring 2017	ENGS 88	Ellen Kim *Investigations of Novel Virus-Like Particles*
Spring 2018	BIO 97	Cheryl Chang *Directed Evolution: Comparative Evaluation of Novel CAR T Cell Extracellular Domains*
Winter 2019	ENGS 87	Benedicte Kuhl Hejgaard *Application of Machine Learning Approaches to Immunology Datasets*

Course Development

ENGG 260 Advances in Biotechnology

This reading-based course, which has grown to be offered three terms per year with an enrollment of 20 graduate students each term, was developed in collaboration with Prof. Karl Griswold, and is subscribed primarily by Ph.D. students in programs ranging from Computer Science and Quantitative Biological Sciences, to the Molecular and Cell Biology Program, and Engineering. In this course, students are pushed to identify, understand, present, and question key recent advances in biotechnology. Beyond serving to keep students apprised of advanced methods, this course is targeted to build regular reading habits, critical evaluation ability, the art of data and figure presentation, best practices in experimental design, and to improve students' technical writing and presentation skills.

PROFESSIONAL AND COMMUNITY ACTIVITIES

EXTERNAL ACTIVITIES, COMMITTEES, AND ADVISORY BOARDS

Years	Group	Role
2011-present	Bill and Melinda Gates Foundation Collaboration for AIDS Vaccine Discovery PI Council	Member (2011-present) Chair (2015-2017)
2012-present	The Center for Synthetic Immunity Scientific Advisory Board	SAB Member
2013	National Academy of Science Workshop on Convergence	Participant
2017	Mechanisms of Fc-dependent, Antibody-mediated Killing NIH NIAID	Organizer and Co-chair
2017	Case for promotion to Research Assistant Professor at Northwestern University	External Referee
2018	ADCC and other Fc-mediated antibody functions in HIV prevention and control NIH NIAID ADCC Workshop	Organizer and Co-chair
2018	Development of mAbs to Achieve Drug-free Sustained Virologic Remission for HIV	Organizer and Co-chair

	NIH NIAID	
2018	US National Academy of Engineering Frontiers of Engineering Symposium	Participant
2018	External Scientific Advisory Board for NIH HIVRAD "Defense-in-depth against Mucosal HIV Clade C Invasion"	SAB Member
2019-present	National Institutes of Health, Vaccine Research Center, Scientific Advisory Working Group	Advisory Group Member

GRADUATE STUDENT THESIS COMMITTEES (external)

Student	Degree	Role	Institution, Department
Justin Eusebio	M.S.	Member	Boston University, GMS Program
Kavitha Baruah	Ph.D.	Member	University of Oxford, Biochemistry
Megan Meuser	Ph.D.	Member	Drexel University, Biochemistry
Wen Shi Lee	Ph.D.	Member	University of Melbourne, Microbiology and Immunology

JOURNAL REVIEW ACTIVITIES

Science
Cell
Science Translational Medicine
The Journal of Clinical Investigation
Nature Microbiology
PLoS Pathogens
PLoS Computational Biology
Journal of Virology
Journal of Immunology
Journal of Molecular Biology
Nature Protocols
Nature Communications
mBio
Protein Engineering Design and Selection
AIDS Research and Human Retroviruses
Biomacromolecules
Expert Review of Anti-infective Therapy
mAbs
Immunology and Cell Biology
Trends in Immunology
International Immunopharmacology
Journal of Immunopharmacology
Journal of Biological Methods
PloS One
Vaccine

GRANT REVIEW ACTIVITIES

Year	Role	Organization	Panel
2014; 2016	Ad Hoc	NIH, NIAID	Vaccine Study Section
2014	Ad Hoc	No Stomach for Cancer	Gastric Cancer Research Award
2014	Ad Hoc	A*STAR	Biomedical Research Council
2015	Ad Hoc	NIH	NH-INBRE
2016	Ad Hoc	amFAR	Innovation Grant Panel
2016	Ad Hoc	amFAR	Bringing Bioengineers into HIV Cure
2016	Ad Hoc	DHMC	Hitchcock Foundation Grants
2017	Ad Hoc	NIH, NIAID	AIDS Immunology and Pathology

2018	Ad Hoc	NIH NIAID	F30, F31, F32 Fellowship
2018	Ad Hoc	NIH, NIAID	R15 – AREA
2018	Ad Hoc	NIH, NIAID	NH-INBRE
2018	Ad Hoc	NIH, NIAID	Special Emphasis Panel, Maintaining Immunity after Immunization

CONSULTING ACTIVITIES

Year	Role	Organization
2011	Outside Consultant	Candela Diagnostics
2016-	Outside Consultant	ImmuNext

ADVISING SERVICE

Year	Role	Activity	Organization
2011-present	Faculty Advisor	First Year Advising	Division of Arts and Sciences
2011-2014	Faculty Advisor	MEM Advising	Thayer School of Engineering
2014	Panelist	Career Development Workshop – Interviewing for a Faculty Position	Postdoc Association
2015	Panelist	Women in Academia	Graduate Women in Science
2015	Panelist	Career Development Workshop – Negotiating a Faculty Position	Postdoc Association
2016	Panelist	Path of Professorship Workshop: Funding	Massachusetts Institute of Technology
2017	Panelist	Becoming Faculty Series: Mentoring	Graduate School of Arts and Sciences

CONFERENCE/WORKSHOP ORGANIZATION

Year	Role	Activity	Meeting
2012	Organizer	Satellite Session	AIDS Vaccine, Boston, MA, USA
2016	Chair	Oral Session	Antibodies as Drugs, Whistler, BC, CA

COMMITTEE ACTIVITIES

DARTMOUTH/THAYER SCHOOL OF ENGINEERING COMMITTEES

Years	Committee	Role
2011-2014	Thayer BE Program Committee	Member
2012-2017	Thayer Distinguished Speaker Series	Member
2013-present	COI Management for Drs. Griswold and Bailey-Kellogg	Monitor
2014-2016	Thayer Ph.D. Innovation Program Admissions Committee	Member
2014-2015	Thayer Undergraduate Curriculum Committee	Member
2015-present	Thayer MS/Ph.D. Program Committee	Member

2015-2016	Thayer MS/Ph.D. Restructuring Subcommittee	Member
2016-2018	Feldberg Library Committee	Member
2016	Thayer Engineering in Medicine Faculty Search Committee	Member
2017-2018	Provost Search Committee	Member
2017-2018	Norris Cotton Cancer Center Faculty Search Committee	Member
2018-2019	Thayer School Dean Search Committee	Member
2018-2021	Council on Academic Freedom and Responsibility	Elected Member
2018-	MD/Ph.D. Program Advisory Committee	Member

GRADUATE STUDENT QUALIFYING EXAM COMMITTEES

Not reported.

GRADUATE STUDENT THESIS COMMITTEES (internal, 35)

Student	Degree	Role	Department
Austin Boesch	Ph.D.	Chair	Engineering
Eric Brown	Ph.D.	Chair	Engineering
Ying Chan	M.S.	Chair	Engineering
Ashwini Bhandiwad	Ph.D.	Member	Engineering
Regina Salvat	Ph.D.	Member	Engineering
Fan Zheng	Ph.D.	Member	Biological Sciences
Hao Cheng	PhD	Chair	Microbiology and Immunology
Nana Yaw Osei-Owusu	M.S.	Chair	Microbiology and Immunology
Casey Hua	MD/Ph.D.	Chair	Microbiology and Immunology
Thach Chu	Ph.D.	Chair	Engineering
Jon Guerrette	M.S.	Member	Engineering
Christina Blazanovic	M.S.	Member	Engineering
Albert Gacarez	Ph.D.	Member	Microbiology and Immunology
Jennifer Lai	Ph.D.	Chair	Engineering
Pranay Bharadwaj	Ph.D.	Chair	Microbiology and Immunology
Andrew Crowley	Ph.D.	Chair	Microbiology and Immunology
Craig McKenzie	Ph.D.	Member	Quantitative Biological Sciences
Joseph Granger	M.S.	Member	Biochemistry
Jilai Zhou	Ph.D.	Member	Biological Sciences
Claire Godberson	Ph.D.	Member	Microbiology and Immunology
Dhananjay Beri	M.S.	Member	Engineering
Jingxuan Cui	Ph.D.	Member	Biological Sciences
Shuen Hon	Ph.D.	Member	Engineering
Arijit Paul	Ph.D.	Chair	Microbiology and Immunology
Daniel Wrapp	Ph.D.	Member	Biochemistry
Chaya Patel	Ph.D.	Member	Microbiology and Immunology
Harini Natarajan	Ph.D.	Chair	Microbiology and Immunology
Iara Backes	MD/Ph.D	Co-Chair	Microbiology and Immunology
Hector Sanchez	Ph.D.	Member	Microbiology and Immunology
Katherine McCoy	Ph.D.	Member	Biological Sciences
Daniel Mattox	Ph.D.	Member	Quantitative Biological Sciences
Yongliang Fang	Ph.D.	Chair	Engineering

Dhananjay Beri	Ph.D.	Member	Engineering
Alison Burklund	Ph.D.	Member	Engineering
Savannah Butler	Ph.D.	Chair	Microbiology and Immunology

INVITED PRESENTATIONS

Local (9)

2012 Patterns in adaptive immunity: profiling antibody specificity and function
Immunology and Cancer Immunotherapy Research Program, NCCC, DHMC, NH

2013 An Engineering take on HIV Vaccinology
Microbiology and Immunology Annual Retreat, DHMC, Lake Morey, NH

2014 Identifying the principal components of protective immunity
Molecular and Cell Biology Annual Retreat, Whitefield, NH

2014 Applying design thinking to HIV vaccinology
Geisel School of Medicine MD/PhD Program Annual Retreat, Lake Morey, NH

2016* Using protein biochemistry to inform HIV vaccine development
Department of Chemistry, Dartmouth College, Hanover, NH

2016* Antibody glycosylation in healthy and immunodeficient children
Dartmouth Superfund Group, Hanover, NH

2016 Fine epitope signature of HIV-1 neutralization breadth at the CD4 binding site
Molecular and Cell Biology Annual Retreat, Whitefield, NH

2017 On the significance of IgG subclass
GSoM Microbiology and Immunology Annual Retreat

2017 Learning the Features of Functionally Potent Humoral Immunity
10th Dartmouth Integrative Biology Symposium

National (44)

2011 Tuning the antibody response: natural modulation of antibody glycosylation and effector function in HIV infection
Antibodies as Drugs, Keystone Symposium, Keystone, CO

2011 How antibodies provide specificity to the innate immune system to fight HIV
American Association of Immunologists Annual Meeting, San Francisco, CA

2011 Leveraging antibody Fc for more effective vaccines
Global Health Research Congress, Seattle, WA

2011 Discovery platform for inducing potent ADCC-recruiting antibodies in vivo
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA

2012 Arrays for Fc receptor binding
ADCC Summit, Duke University, Durham, NC

2012 Profiling humoral immunity: determining antibody innate immune recruiting capacity
AIDS Vaccine 2012, Boston, MA

2012 A walk on the dark side of antibodies
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA

2013 Parsing humoral immunity: array technology to profile the natural modulation of antibody function
American Institute of Chemical Engineers Society for Biological Engineering, International Conference on of Biomolecular Engineering, Ft. Lauderdale, FL

2013 Array technology to profile natural modulation of antibody function

GTC Immunotherapeutics and Immunomonitoring, San Diego, CA

2013 Non-neutralizing antibody functions that act where it counts
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA

2013 Resolving antibody activity across species
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA

2014 Understanding the role of glycosylation in antibody effector function
PepTalk – The Protein Science Week, Palm Springs, CA

2014 Learning predictive models of antibody activity
Collaboration for AIDS Vaccine Discovery, Vaccine Immune Monitoring Consortium Annual Scientific Advisory Board Meeting, Washington, DC

2014 Glycosylation signatures in predictive models of antibody activity
National Institute of Health, Glycoimmunology Workshop, San Diego, CA

2014* A tale of two adjuvants
National Institute of Allergy and Infectious Disease, NIH, Washington, DC

2014 IgG recognition characteristics of rhesus macaque FcgR
Workshop on Innate Immune Responses to HIV and HIV Vaccines, National Institute of Allergy and Infectious Disease, NIH, Bethesda, MD

2015* Systems Serology: Understanding the features of functionally potent antibody responses
Military HIV Research Program, Walter Reed Army Institute of Research,

2015 Potentiating protective antibody activity: a systems serology approach
Conference of Retroviruses and Opportunistic Infections (CROI), Seattle, WA

2015 Breaking the species barrier: IgG subclasses in man and macaques
Institute of Human Virology, Annual Meeting, University of Maryland, Baltimore, MD

2015* Towards a grand unified theory of antibody activity: learning the features of functionally potent antibody responses
NIH Vaccine Research Center Seminar Series, Bethesda, MD

2015* High-resolution antibody profiling to enable insights into mechanisms of humoral immunity
MassBiologics, Boston, MA

2015 Correlates of P\protection in an NHP study of the FLSC immunogen
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA

2016 Profiling protective antibody responses
HIV Vaccines, Keystone Symposia, Squaw Valley, CA

2016 Building a bridge across the species barrier: immunoglobulin biology in rhesus macaques and humans
Translating Innovation in Discovery through Collaboration Symposium, Cambridge, MA

2016 Fine epitope signature of HIV-1 neutralization breadth at the CD4 binding site
Institute of Human Virology, Annual Meeting, University of Maryland, Baltimore, MD

2016 FcγR and Cross-Reactivity for Human and NHP IgG Antibodies and Effects of Glycosylation on Antibody Function
NHP Transplantation Techniques Workshop, NIH, Bethesda, MD

2016* Learning the protein biochemistry of potent anti-HIV antibody responses
Department of Biochemistry and Molecular Biology, Drexel University Medical Center, Phildelphia, PA

2017* Rules of Engagement: Design principles for effective antiviral immunity
Thayer School of Engineering, Dartmouth College
Hanover, NH

2016 Functional Characterization of Macaque FcR and IgG Subtypes
Immuno-oncology Summit, Boston, MA

2016 IgG3 Structure and Function
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA
2017 Discovery platform for inducing potent ADCC-recruiting antibodies in vivo
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA
2017 Anti-Drug Antibody Response Characterization for CAVD Studies
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA
2017* Rules of Engagement: Design Principles for Effective Antibodies
Mount Sinai School of Medicine, New York, NY
2017 Evaluation of Antibodies in the Setting of Infectious Disease at Dartmouth
University of Vermont, Burlington, VT
2017 Rules of Engagement: Design Principles for Effective Antiviral Immunity
Amgen Young Investigator Lecture, California Institute of Technology, Pasadena, CA
2017 Adaptive Immune Responses and Their Measurement
HIV Vaccine Trials Network, HIV Vaccine Scholars Conference, Washington, DC
2018 A Crowdsourced Understanding of Functionally Potent Antibodies
Mechanisms of Fc-dependent, Antibody-mediated Killing, NIH NIAID, Rockville, MD
2018 Toward Consolidating Correlates of Protection from NHP Challenge Studies
ADCC and other Fc-mediated antibody functions in HIV prevention and control
NIH NIAID ADCC Workshop, Rockville, MD
2018 A First Pass at Harmonizing ADCC Assays… and a look beyond
Collaboration for AIDS Vaccine Discovery Annual Meeting, Bill and Melinda Gates Foundation, Seattle, WA
2019 *Measuring and Mining Antibody Responses to Understand Protection from Infection*
Molecular Approaches to Vaccines and Immune Monitoring, Keystone, CO
2019 *TBD*
American Society for Reproductive Immunology Annual Meeting, Grand Rapids, MI
*2019** *TBD*
Department of Chemical Engineering and Materials Science, University of Minnesota
pending *TBD*
Department of Bioengineering, University of Illinois at Urbana-Champaign
2020 *TBD*
HIV Vaccines and HIV Pathogenesis and Cure, Keystone, CO

International (10)
2011 Natural modulation of antibody glycosylation and effector function
EUROPRISE Antibodies Beyond Binding, Strasbourg, France
2012* Antibody effector functions
University of Oxford, Oxford
2014 Functions of protective antibodies
HIV Vaccines, Keystone Symposia, Banff, Alberta, Canada
2014 Systems serology: modeling antibody effector function
HIV Vaccines: Prospects for the Future, Les Cents Gardes, Fondation Meriuex, Les Pensieres, Annecy, France
2014 A systems serology approach to vaccine evaluation
HIV Research for Prevention, Cape Town, South Africa
2015 Modeling Antibody Effector Function
The US-Japan Cooperative Medical Science Program 17th International Conference on

Emerging Infectious Diseases, Taipei, Taiwan

2015 Polyfunctional HIV-specific antibody responses are associated with spontaneous HIV control
HIV Vaccines: Prospects for the Future, Les Cents Gardes, Fondation Meriuex, Les Pensieres, Annecy, France

2016 Evolution of antibodies for optimized effector function activities
Antibodies as Drugs, Keystone Symposia, Whistler, British Columbia, Canada

2016 IgG glycans in children with immunodeficiency
GlycoIgG, Dubrovnik, Croatia

2017 Helping Vaccine Design with Systems Serology
4th International Neonatal and Maternal Immunization Symposium, Brussels, Belgium

*full research seminars

SCHOLARSHIP

ORIGINAL RESEARCH PUBLICATIONS

notes: **Authors** in underlined bold text represent Dr. Ackerman's trainees. *Co-authorships are denoted with an asterisk.

Prior to Dartmouth (1-7)

1. **Ackerman ME**, Chalouni C, Schmidt MM, **Raman VV**, Ritter G, Old LJ, Mellman I, Wittrup KD. A33 antigen displays persistent surface expression. Cancer Immunol Immunother. 2008;57(7):1017-27. Epub 2008/02/01. doi: 10.1007/s00262-007-0433-x. PubMed PMID: 18236042; PMCID: 2836164.
2. **Ackerman ME**, **Pawlowski D**, Wittrup KD. Effect of antigen turnover rate and expression level on antibody penetration into tumor spheroids. Mol Cancer Ther. 2008;7(7):2233-40. Epub 2008/07/23. doi: 10.1158/1535-7163.MCT-08-0067. PubMed PMID: 18645032; PMCID: 2831054.
3. **Ackerman M**, **Levary D**, Tobon G, Hackel B, Orcutt KD, Wittrup KD. Highly avid magnetic bead capture: an efficient selection method for de novo protein engineering utilizing yeast surface display. Biotechnol Prog. 2009;25(3):774-83. Epub 2009/04/14. doi: 10.1002/btpr.174. PubMed PMID: 19363813; PMCID: 2837102.
4. Hackel BJ, **Ackerman ME**, Howland SW, Wittrup KD. Stability and CDR composition biases enrich binder functionality landscapes. J Mol Biol. 2010;401(1):84-96. Epub 2010/06/15. doi: 10.1016/j.jmb.2010.06.004. PubMed PMID: 20540948; PMCID: 3927142.
5. Orcutt KD, **Ackerman ME**, Cieslewicz M, **Quiroz E**, Slusarczyk AL, Frangioni JV, Wittrup KD. A modular IgG-scFv bispecific antibody topology. Protein Eng Des Sel. 2010;23(4):221-8. Epub 2009/12/19. doi: 10.1093/protein/gzp077. PubMed PMID: 20019028; PMCID: 2841541.
6. **Ackerman ME**, Moldt B, Wyatt RT, Dugast AS, **McAndrew E, Tsoukas S**, Jost S, Berger CT, Sciaranghella G, Liu Q, Irvine DJ, Burton DR, Alter G. A robust, high-throughput assay to determine the phagocytic activity of clinical antibody samples. J Immunol Methods. 2011;366(1-2):8-19. Epub 2011/01/05. doi: 10.1016/j.jim.2010.12.016. PubMed PMID: 21192942; PMCID: 3050993.
7. Dugast AS, Tonelli A, Berger CT, **Ackerman ME**, Sciaranghella G, Liu Q, Sips M, Toth I, Piechocka-Trocha A, Ghebremichael M, Alter G. Decreased Fc receptor expression on

innate immune cells is associated with impaired antibody-mediated cellular phagocytic activity in chronically HIV-1 infected individuals. Virology. 2011;415(2):160-7. Epub 2011/05/14. doi: 10.1016/j.virol.2011.03.012. PubMed PMID: 21565376; PMCID: 3112178.

At Dartmouth (8-67)

8. Lamppa JW, **Ackerman ME**, **Lai JI**, Scanlon TC, Griswold KE. Genetically engineered alginate lyase-PEG conjugates exhibit enhanced catalytic function and reduced immunoreactivity. PLoS One. 2011;6(2):e17042. Epub 2011/02/23. doi: 10.1371/journal.pone.0017042. PubMed PMID: 21340021; PMCID: 3038863.
9. **Ackerman ME**, **Lai JI**, Pastan I, Wittrup KD. Exploiting bias in a non-immune human antibody library to predict antigenicity. Protein Eng Des Sel. 2011;24(11):845-53. Epub 2011/09/13. doi: 10.1093/protein/gzr046. PubMed PMID: 21908549.
10. **Levary DA**, Parthasarathy R, Boder ET, **Ackerman ME**. Protein-protein fusion catalyzed by sortase A. PLoS One. 2011;6(4):e18342. Epub 2011/04/16. doi: 10.1371/journal.pone.0018342. PubMed PMID: 21494692; PMCID: 3071835.
11. **McAndrew EG**, Dugast AS, **Licht AF, Eusebio JR**, Alter G, **Ackerman ME**. Determining the phagocytic activity of clinical antibody samples. J Vis Exp. 2011(57):e3588. Epub 2011/12/07. doi: 10.3791/3588. PubMed PMID: 22143444; PMCID: 3308623.
12. **Brown EP, Licht AF**, Dugast AS, **Choi I**, Bailey-Kellogg C, Alter G, **Ackerman ME**. High-throughput, multiplexed IgG subclassing of antigen-specific antibodies from clinical samples. J Immunol Methods. 2012;386(1-2):117-23. Epub 2012/10/02. doi: 10.1016/j.jim.2012.09.007. PubMed PMID: 23023091; PMCID: 3475184.
13. **Ackerman ME**, Crispin M, Yu X, Baruah K, **Boesch AW**, Harvey DJ, Dugast AS, Heizen EL, Ercan A, **Choi I**, Streeck H, Nigrovic PA, Bailey-Kellogg C, Scanlan C, Alter G. Natural variation in Fc glycosylation of HIV-specific antibodies impacts antiviral activity. J Clin Invest. 2013 Apr 8. doi:pii: 65708. 10.1172/JCI65708. PubMed PMID: 23563315
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15. **Boesch AW, Zhao Y, Landman AS**, Garcia MR, Fahey JV, Wira CR, **Ackerman ME**. A multiplexed assay to detect antimicrobial peptides in biological fluids and cell secretions. J Immunol Methods. 2013;397(1-2):71-6. Epub 2013/09/17. doi: 10.1016/j.jim.2013.09.001. PubMed PMID: 24035708; PMCID: 3819932.
16. Bolton GR, **Ackerman ME, Boesch AW**. Separation of nonfucosylated antibodies with immobilized FcgammaRIII receptors. Biotechnol Prog. 2013;29(3):825-8. Epub 2013/04/05. doi: 10.1002/btpr.1717. PubMed PMID: 23554380.
17. **Boesch AW, Brown EP, Cheng HD, Ofori MO, Normandin E**, Nigrovic PA, Alter G, **Ackerman ME**. Highly parallel characterization of IgG Fc binding interactions. MAbs. 2014;6(4):915-27. Epub 2014/06/14. doi: 10.4161/mabs.28808. PubMed PMID: 24927273.
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19. Chung AW, Crispin M, Pritchard L, Robinson H, Gorny MK, Yu X, Bailey-Kellogg C, **Ackerman ME**, Scanlan C, Zolla-Pazner S, Alter G. Identification of antibody glycosylation

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27. **Brown EP, Normandin E, Osei-Owusu NY**, Mahan AE, **Chan YN, Lai JI**, Vaccari M, Rao M, Franchini G, Alter G, **Ackerman ME**. Microscale purification of antigen-specific antibodies. J Immunol Methods. 2015;425:27-36. doi: 10.1016/j.jim.2015.06.005. PubMed PMID: 26078040; PMCID: 4604017.
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note: 40 of 72 publications with Dartmouth affiliation represent first/last/corresponding author contributions; publications include 6 different undergraduate co-authors and 14 different graduate student co-authors

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CONFERENCE ABSTRACTS

Not reported.

PATENTS

At Dartmouth (P1-P2)

P1. Provisional Patent Application No.: 62/323,039. PCT/US2017/027615; WO2017181001A1
Title: **High affinity B7-H6 antibodies and antibody fragments**, Inventors: Margaret E. Ackerman, Casey K. Hua, Charles L. Sentman
Licensed.

P2. Provisional Patent Application No.: 62744325. Filed Fall 2018.
Title: **Compositions and Methods For Preventing or Ameliorating Neonatal HSV Infection**, Inventors: Margaret E. Ackerman, Iara M. Backes, David A. Leib, Chaya Patel, Anthony M. Moody.