

# GLOBAL DOCTORAL PARTNERSHIPS



NIH Oxford-Cambridge Scholars Program



NIH MD I PhD  
Partnership  
Training Program



NIH

PhD Studentships



# NEWS

FALL 2015

## A HISTORY OF COLLABORATION

Over the past year, the OxCam Program had more than one opportunity to work with the Albert & Mary Lasker Foundation (Lasker Foundation) in an effort to enhance academic enrichment. Joined by the International Biomedical Research Alliance (Alliance), these groups have been working to develop and encourage their already invaluable relationship for the benefit of students in the GDP and the Lasker Clinical Research Fellowship.

### SALVADOR DALI UNVEILING

Mary Lasker, a champion and advocate for medical research, founded the Lasker Foundation with the vision of a healthier world through medical research. In 1984, the NIH dedicated The Mary Woodard Lasker Center for Health Research and Education, also known as the "Cloisters", in her honor. Mary Lasker donated a commissioned Salvador Dali lithograph, "Winged Victory – Washington," which she signed and displayed in the Center. In 2014, Dr. Claire Pomeroy (pictured above with Lasker Board Members), President of the Lasker Foundation, with the assistance of OxCam Scholar Jamie Solis, worked to reframe the lithograph and provide a plaque to highlight the importance of the piece as a representation of the historic relationship between the Lasker Foundation and the NIH.

In April, leaders from the Lasker Foundation joined GDP scholars and representatives from the Alliance to celebrate the contributions of Mary Lasker and her relationship with the NIH at an official unveiling of the re-appointed piece. Attendees included Mr. Willard Overlock, Jr. (pictured above), Lasker Foundation Chairman, Dr. Claire Pomeroy (pictured above), and three Alliance members Mr. Stephen McLean, Alliance Chairman, who welcomed everyone to the event; Ms. Randi Balletta, Alliance Board President, who was instrumental in the organization and execution of the event; and former NIH - National Cancer Institute Director and Alliance board member, Dr. John Niederhuber.



MORE ON THE LASKER FOUNDATION ON PAGE 2

## A FOND FAREWELL TO DR. KATHY ZOON

For close to 10 years, Dr. Kathy Zoon has served as Scientific Director for NIAID and, as such, has been pivotal in the growth and success of the GDP, a training program housed under NIAID that spans the entire NIH. Dr. Zoon has been unwavering in her support of graduate training at the NIH and has worked tirelessly in her role overseeing the GDP.

It is with heartfelt thanks and gratitude that we bid farewell to Dr. Zoon as the Scientific Director of NIAID as she returns to the bench, having stepped down from her position as Scientific Director on August 1st. We thank Dr. Zoon for her lasting support of the program and her scientific guidance and leadership throughout the years that has made the GDP such a success. We wish her the best with her future endeavors and look forward to her continued involvement with the program.



## STUDENT ENRICHMENT

### Visiting alumnus keeps an open-mind

When 2009 alumnus Dr. Austin Swafford stopped by the NIH to meet with current students, he came to discuss his path from PhD to post-doc to industry and ended up discussing much more. Swafford spent a year in the Presidential Postdoctoral Fellowship Program at Novartis Institutes for Biomedical Research, but found himself looking for a change. Now a Field Applications Specialist for Labcyte, Inc., he is enjoying the unexpected direction he has taken in his career. He spoke with attendees about the importance of keeping an open mind, and about the differences between academic research and research in the world of industry.

### Setting up your lab: Not as easy as it looks

Dr. Greg Alushin met with GDP Scholars to share his experiences as a young researcher. Winner of the NIH Director's Early Independence Award, he shed some light on the ups and downs of getting, and setting up, his own laboratory. Dr. Alushin, who won the award shortly after the completion of his PhD, spoke with students about the things that you don't learn during your formal training. From ordering equipment and supplies to hiring staff, Dr. Alushin shared his experiences handling the logistical issues that can interfere with the productivity of a young researcher. Dr. Alushin also encouraged scholars to take the risk and apply for the Early Independence Award, offering his support and assistance to any applicants.

### CDC reps visit

GDP scholars enjoyed a visit from three members of the Centers for Disease Control Epidemic Intelligence Service (CDC-EIS). Here to discuss their involvement in the response to emerging epidemics, the guest speakers talked about their different roles as members of the EIS. Those in attendance gained insight into the experience of combating an unpredictable outbreak, and learned more about the skills that CDC and EIS scientists developed by necessity to respond to real-time threats.

## NOTABLE EVENTS

### Changing of the guard



We said farewell to **Professor Ken Smith** at the Annual Workshop in Cambridge as he handed over the reigns to **Dr. Menna Clatworthy**, the new Director of the Cambridge OxCam Program.

### OxCam founder wins award

Dr. Michael Lenardo was elected as a fellow of the American Academy of Arts and Sciences. This honor recognizes the considerable impact and distinct contributions of his research, as well as his leadership in the field. Dr. Lenardo was one of the founders of the OxCam Program and served as the Program Director from 2001 – 2011. He continues to work closely with the International Biomedical Research Alliance in order to provide new and unique opportunities for OxCam and Wellcome Trust scholars.

### Alliance continues support

The International Biomedical Research Alliance continues to support the scholars in part by their continued efforts to encourage events aimed at enhancing the scholars' experience and education. Executive Chairman, **Fuad El-Hibri**, has demonstrated his commitment to supporting the next generation of biomedical researchers by awarding the first Fuad El-Hibri Scholarship to Class of 2015 scholar, **Samuel Katz**. Sam, joining the laboratories of Dr. Iain Fraser (NIAID) and Prof. Clare Bryant (University of Cambridge) hopes to combine his experiences in molecular biology and systems biology to synergistically use these powerful investigative tools to elucidate parts of the immune system's complexity, contribute to the understanding of the immune system's function in health and disease, and demonstrate how these understandings can be applied to medicine and disease reduction.



In Order: Mr. El-Hibri with Sam Katz and Mrs. El-Hibri

## LASKER COLLABORATION CONTINUED FROM PG. 1

### LASKER LESSONS IN LEADERSHIP

May 19th of this year marked the Inaugural Lasker Lessons in Leadership. This series, designed by the combined efforts of the Lasker Foundation, the Alliance, and the OxCam Program, was developed to invite distinguished leaders and outstanding biomedical scientists to the NIH to inspire future leaders amongst the GDP and the NIH Lasker Clinical Research Fellows.

The series is structured to provide a unique and engaging mentoring opportunity through both formal and informal mentoring interactions. In order to facilitate this opportunity and to engage all of our scholars, keynote presentations are broadcast live via the NIH VideoCast service so that scholars in the UK and other locations may also participate in the event. For this inaugural event, both panelists and the keynote speaker were asked to focus on general leadership experiences and advice. Future events will focus on different aspects of career development and leadership opportunities from the perspective of both senior and junior level scientists and biomedical leaders.

The Inaugural event opened with three panelists, Dr. Heidi Kong, MD, MDSc (NCI), Dr. Todd Macfarlan, PhD (NICHD), and Dr. Joshua Milner, MD (NIAID). Dr. Aaron Neal, recent OxCam graduate (Class of 2009) moderated the panel discussion questions from his fellow scholars. The Keynote Speaker for this event, Dr. Ralph Snyderman, Chancellor Emeritus and James B. Duke Professor of Medicine at Duke University, followed the panel discussion with a talk about his career "From Brooklyn to Lab Bench to Board Room: Lessons Learned." "Challenge yourself by surrounding yourself with the best," he advised scholars, while talking about some of his accomplished colleagues.

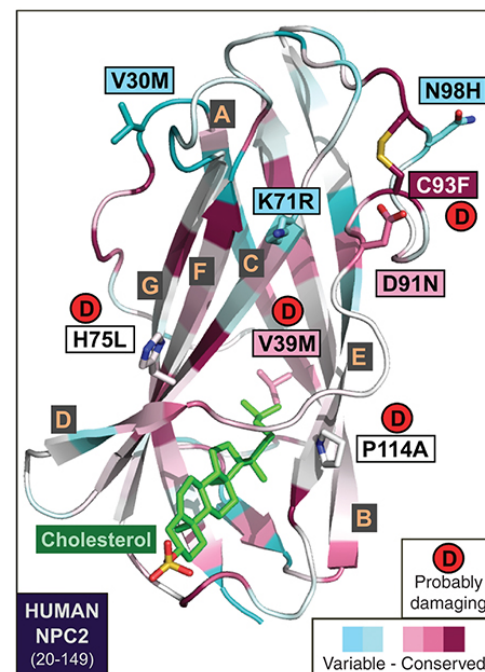
The second Lasker Lessons in Leadership addressed "The Art of Publishing", with Keynote Speaker Dr. Dan Littman, professor of molecular immunology at New York University, kicking off the event. After Dr. Littman's talk, he joined the panel to answer questions and discuss different aspects of publishing in the scientific field. Panelists Dr. Beverly Purnell, PhD (Senior Editor, *Science*), Dr. Enrique Schisterman, PhD (NICHD), and Dr. Alan Sher, PhD (NIAID) were selected due to their expertise in publishing: from authoring primary papers, book chapters, and reviews to advice on selecting journals for publications. OxCam Scholar Eva Archer (Class of 2012) took the role of moderator for the discussion and didn't have any problem keeping the questions coming.

You can watch both Dr. Snyderman's and Dr. Littman's keynote presentations here: <http://www.laskerfoundation.org/programs/leadership.htm>.

The next Lasker Lessons in Leadership event on January 14, 2016 will focus on Communication with Keynote Speaker Dr. Linda Fried, Dean of the Columbia University Mailman School of Public Health.

## SCIENTIFIC COLLABORATION

**Dr. Chris Wassif** (Class of 2011) & **Joanna Cross** (Wellcome Trust Class of 2012) published a joint paper in *Genetics in Medicine*, "High incidence of unrecognized visceral/neurological late-onset Niemann-Pick disease, type C1, predicted by analysis of massively parallel sequencing data sets" along with their co-mentors, Dr. Forbes Porter (NICHD) and Prof. Frances Platt (Oxford) with additional collaborators at both the NIH and Oxford. Niemann-Pick is a neurodegenerative disease caused by specific gene mutations that is difficult to diagnose. Through this collaboration, Chris and Joanna used parallel exome sequencing to substantiate a late-onset phenotype of this disease that has a higher clinical incidence than previously known. These findings could lead to the application of the appropriate treatment for those who have gone undiagnosed and suffer from visceral lipidosis or unexplained neurological symptoms.





# SCIENTIST SPOTLIGHT



Dr. Pamela Guerrierio has been fortunate to have Dr. Guerrierio present her research to program interviewees in February 2015. When we reached out to Dr. Guerrierio this fall, she provided us with details on her current research (below):

*Compelling evidence supports a role for both environmental and genetic factors in the pathogenesis of food allergy, but development of novel treatment strategies will depend upon identification of specific molecular targets that drive the development and/or severity of this disease. We have recently identified the  $TGF\beta$  pathway as such a potential target. We have shown that patients with Loeys-Dietz syndrome (LDS), an autosomal dominant disorder caused by mutations in genes encoding the receptor for  $TGF\beta$ , exhibit a high prevalence of food allergy, asthma, eosinophilic esophagitis (EoE) and other allergic conditions. One of the goals of our lab is to elucidate the key cellular and biochemical mechanisms by which altered  $TGF\beta$  signaling promotes allergic inflammation. Towards this end, we study both patients with LDS as well as mouse models of the disease that completely recapitulate the human phenotype. Ultimately, we hope to apply the information learned from our studies to develop new therapies for patients who suffer from allergic diseases.*

## FAMILIAR FACES

NIH OxCam Scholars and guests at this year's Annual Workshop in Cambridge had no shortage of amazing scientific speakers to engage with throughout the three day event, but it was a particular pleasure to see the return of two successful young alumni.

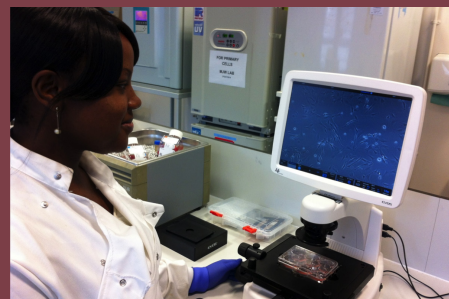
**Dr. Jason Mellad** (left) returned to his alma mater, Cambridge, to speak with former peers and colleagues about his experience working as Head of Business Development and Consultancy at Cambridge Epigenetix. Dr. Mellad was enthusiastic about the diversity of his position and the fact that he still gets to do research and be in the lab, while gaining experience in other areas as well.

**Dr. Prantik Kundu** (right), a 2014 alumnus, hasn't been gone long but was happy to join his peers and speak about his position at Mt Sinai as an Assistant Professor in Radiology and Psychiatry in the Icahn School of Medicine. Dr. Kundu spoke with former classmates about the challenges he faced taking a teaching position straight out of the program. He also took some time to briefly highlight some of his research, which largely involves the science behind alcoholism and other forms of addiction and compulsive behaviors.

Every opportunity to reconnect with program alumni provides a wonderful reminder of what an amazing resource they are for our current scholars.



## The role of alpha-synuclein overexpression in the pathogenesis of Parkinson's Disease



By: Sabrina Heman-Akcah

Overabundance of alpha-synuclein has long been implicated in the pathogenesis of Parkinson's disease (PD), but neither the normal actions of alpha-synuclein, nor the mechanism by which overexpression of alpha-synuclein leads to neurodegeneration are known. The aim of my thesis research is thus to evaluate the role of alpha-synuclein overexpression in the cellular and molecular pathogenesis of PD, using patient-specific induced pluripotent stem cell (iPSC) models and CRISPR/Cas9-based genome engineering tools as a platform for discovery. The ability to reprogram adult somatic cells into pluripotent cells by the introduction of genetic factors was discovered in 2006 (Takahashi and Yamanaka, 2006), and the subsequent development of protocols to differentiate these cells into disease-relevant cell types has enabled in-depth molecular analyses of multiple disease states as never previously attainable. By differentiating neurons from PD patient-specific iPSCs harboring an alpha-synuclein triplication, I have been able to discern molecular phenotypes which result from alpha-synuclein overexpression in this disease context. The application of CRISPR/Cas9 to mammalian systems in 2013 (Cong et al. 2013, Mali et al. 2013) revolutionized genome editing efforts. Applying this technology in my projects has enabled me to probe further into the molecular contributions of alpha-synuclein to neurodegeneration in PD, particularly by enabling the evaluation of phenotypes resulting specifically from overabundant alpha-synuclein without the interference of variable genetic background. Having identified some compelling phenotypes using these systems, I will spend my last year of study in the OxCam Program, delving further into these pathogenic outcomes and attempting to perturb them for neuroprotective benefit.

Studying in the OxCam program has provided more opportunities for professional development than I could have imagined. Through my first year of study at the NIH Center for Regenerative Medicine, I learned the techniques that formed the foundation of my projects. In addition to helping me develop the ultimate direction of my thesis work, my Oxford mentor, Professor Matthew Wood, has provided opportunities for me to develop practical skills for a successful career in biomedical science, such as scientific writing and grant procurement. Beyond the incredible experience I have had working within my two official groups, I have been fortunate to develop collaborations with investigators throughout the NIH (NIAMS, NINDS) and Oxford (Genome Engineering Oxford, Weatherhall Institute for Molecular Medicine, Oxford Stem Cell Institute, Oxford Centre for Gene Function) that have resulted in publications, driven my projects forward, and generally enhanced my experiences at both institutions. Furthermore, as an MD-PhD student, I was afforded the unique experience of observing the neurosurgical care of PD patients at the NIH Clinical Center. I am so grateful to have had the tremendous support of the UNC MD-PhD Program in pursuing graduate study in the OxCam Program, and for the opportunities that have been made available to me through the OxCam Program, both of which I am confident will serve as the conduit to my future endeavors in clinical medicine and biomedical science.

# ONWARD AND UPWARD

The following students have successfully defended their thesis and are moving on to the next phase in their careers. Whether they are returning to medical school or taking research positions in academia or industry, we wish them the best of luck in all of their future endeavors:

**Katie Deigan Warner** “Developing and characterizing novel ligands for riboswitches”  
Mentors: Adrian Ferré-D’Amaré (NHLBI) & Chris Abell (Cambridge)

**Ryan Harrison** “Molecular biophysics of strong DNA bending and the *RecQ* DNA helicase”  
Mentors: Keir Neuman (NHLBI) & Jonathan Doye (Oxford)

**Adam Knight** “Identification of *R11D1.1/Wdr22* as a conserved regulator of axonal mitochondrial transport”  
Mentors: Zu-Hang Sheng (NINDS) & Michael Coleman (Cambridge)

**Michael Krause** “Investigation of genetic determinants of drug response in a *Plasmodium falciparum* genetic cross using a high-throughput screening method”  
Mentors: Rick Fairhurst (NIAID) & Dominic Kwiatkowski (Oxford)

**John McManigle** “Three dimensional geometric image analysis for interventional electrophysiology”  
Mentors: David Bluemke (CC) & Alison Noble (Oxford)

**Muktha Natrajan** “Retinoid X receptor activation reverses age-related deficiencies in myelin debris phagocytosis and CNS remyelination”  
Mentors: Bibiana Bielekova (NINDS) & Robin JM Franklin (Cambridge)

**Aaron Neal** “Identifying genetic determinants of impaired *PfEMP1* export in *Plasmodium falciparum*-infected erythrocytes”  
Mentors: Rick Fairhurst (NIAID) & Chris Newbold (Oxford)

**Kristen Pluchino** “Generation of chimeric P-glycoprotein for functional and structural investigations”  
Mentors: Michael Gottesman (NCI) & Deborah Gill (Oxford)

**Michael Tee** “Image analysis of cardiac computed tomography towards regional functional analysis”  
Mentors: David Bluemke (CC) & Alison Noble (Oxford)

**Casmir Turnquist** “The role of *p53* and *ASPP2* in neurodegenerative disease”  
Mentors: Curtis Harris (NCI) & Xin Lu (Oxford)

**Coralie Viollet** “Dissecting the interactive effects of hypoxia and Kaposi’s sarcoma-associated herpesvirus on microRNA and mRNA transcriptomes”  
Mentors: Robert Yarchoan (NCI) & Jiannis Ragoussis (Oxford)

**Stan Wang** “Reprogramming and epigenetic factors regulating pluripotency and the stem cell state”  
Mentors: Vittorio Sartorelli (NIAMS) & John Gurdon (Cambridge)

**Chris Wassif** “Dysregulation of cholesterol homeostasis”  
Mentors: Forbes Porter (NICHD) & Frances Platt (Oxford)

**Bennett Waxse** “Examining Connexin-43 Gap Junction remodeling by the cytoskeleton, an unconventional myosin motor and other cellular machinery”  
Mentors: Jennifer Lippincott-Schwartz (NICHD) & Folma Buss (Cambridge)

**Luke Wylie** “*Ascl1* phosphoregulation promotes proliferation or differentiation in *Xenopus laevis* and neuroblastoma”  
Mentors: Carol Thiele (NCI) & Anna Philpott (Cambridge)

**Baltazar Zavala** “The role of subthalamic nucleus oscillatory activity as it pertains to decision making.”  
Mentors: Kareem Zaghloul (NINDS) & Peter Brown (Oxford)

## REMINDERS / EVENTS

### LASKER LESSONS IN LEADERSHIP

*Communication*

**January 14, 2016**

Keynote Speaker: Dr. Linda Fried

### LASKER LESSONS IN LEADERSHIP

*Leadership in Medicine*

**March 31, 2016**

Keynote Speaker: Dr. Craig Thompson

### GLOBAL DOCTORAL PARTNERSHIPS ANNUAL WORKSHOP

*University of Oxford, Keble College*

**June 22 - 23, 2016**

### Letter From the Program Scientific Director

Dear Scholars,

It's hard to believe 2015 is already coming to a close although cold nights, decreasing sunlight, and holiday decorations appearing in local stores are dead giveaways that winter is fast approaching. Although the holiday season is an exciting time of year, often involving family celebrations, work gatherings, and vacation travel, it turns out to be one of the busiest times of the year for the NIH Oxford-Cambridge Scholars Program because autumn is application season for new students interested in joining this exciting collaborative doctoral program!

For Dr. Elaine Ostrander (NHGRI), Director of Admissions, it can be especially hectic as applications are due December 1, 2015, with her team of more than 20 NIH, Oxford, and Cambridge principal investigators spending large amounts of time reading student essays and carefully discussing the large number of applicants that will be selected for panel interviews in early February. It's a labor of love for those of us who lead and support this outstanding and one-of-a-kind program.

Although we spend lots of time spreading the word about this unique doctoral program, we also rely on our current and past students, as well as faculty, to also spread the word to the many undergraduate institutions across the country. Therefore, we ask each of you to take a few minutes this Fall to forward the NIH OxCam website link or pass on the program brochure and this newsletter to colleagues across the country that may not be aware of the program. This would be an easy holiday gift for me and help ensure the program continues to recruit the best and brightest!

Enjoy the holidays and best wishes for 2016 and beyond.

Cheers,  
Tom

### Greetings from the OxCam Office!

There have been many exciting highlights over the past year and I would like to take this opportunity to formally welcome Angela Harris, Program Assistant, and Kevin Fomalont, Program Analyst, to the OxCam Administrative Team. Please note that our office phone numbers have changed. You can find our contact details on the OxCam website or in NED.

The launch of the new website and official social media accounts for the OxCam Program (Facebook and Twitter) have provided new resources for expanding the presence of the OxCam Program and sharing important news and information throughout the year. **Remember to like us on Facebook** (<https://www.facebook.com/NIHOxCam/>) and **follow us on Twitter** (@NIHOxCam).

We look forward to seeing and hearing from all of you in the upcoming year, especially at the Annual Workshop hosted by the University of Oxford, June 22-23, 2016.

Wishing you all the best this holiday season.

**Katie Soucy, Managing Director.**