Hello, and thank you for taking a look at the Fall 2014 edition of Phi Psi, the American Physician Scientists Association (APSA) biannual newsletter. Our goal is to inform both members and nonmembers interested in combining science and medicine into their future careers about the happenings within APSA and the physician-scientist community-at-large. Michael Guo, our president, starts off the newsletter with an introduction to the new academic year. Peter Mittwede from the APSA Membership Committee summarizes the goals and hopes of expanding membership and local chapters across the country. Travis Hull and Aisha Siebert explain their experiences on the Hill and policy changes that may affect physician-scientists. Andrew Harrison writes about the art of medicine, with a focus on the need for diversity and stigmas of mental disease in our society. Christopher Cychosz and Thomas Pak discuss the unique challenges and importance of pure MDs carrying out basic and clinical and basic investigations. Jeffrey Singer follows up on how the American Gastroenterological Association (AGA) hopes to encourage MD-PhDs to pursue careers in academic gastroenterology. We continue our outreach efforts through our undergraduate liaisons who describe their goals for recruiting more college students into the physician-scientist pipeline. Please also mark your calendars for our upcoming Annual APSA Meeting in Chicago, which will take place in April 2015—we have an exciting lineup of speakers. Hope you can attend!

From the President
Michael Guo, APSA President, University of Florida

Dear APSA members, colleagues, and friends,

Building off the tremendous progress over the last year, APSA enters its 11th year with great momentum and many exciting events and initiatives. With the new academic year kicking off, I wanted to take this opportunity to highlight some of the remarkable progress APSA has made in the past year and some of the exciting things we have in store for the upcoming year.

APSA is really a member-focused organization, and as such, the core purpose of APSA is to provide useful resources and benefits for its members and physician-scientist trainees around the country. This year, we are building many new initiatives that

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An overwhelming majority of successful medical school applicants participate in some form of research over the course of their undergraduate education. Unfortunately, the proportion of those students who choose to participate in scientific exploration significantly decreases as they progress through their medical training. Fortunately, medical education institutions are realizing the merit and value of medical doctors conducting research and have been promoting, or in certain cases mandating, research experience. This article provides the unique perspective of medical students on the challenges and importance of MDs conducting research.

Conducting research as a physician is not an easy task and takes much dedication starting from the physician’s journey as a student. Medical students are required to learn an inordinate amount of knowledge in their pre-clinical years in addition to preparing for USMLE Step 1, making time for extracurricular activities scarce. Although a good number of medical students conduct research, the limited time hinders students’ ability to conduct sustained and meaningful research. Most students who participate in research do so during the summer or during scheduled breaks from classes. In addition scientific research does not always yield positive results, so invariably students can be discouraged by the lack of results during their time in the lab.

There are medical students who participate in yearlong fellowships, which allow them to conduct more meaningful research. However, many students have difficulty taking a year out of school due to mounting student loan debt. For the medical students who sustained their passion for research, residency can be even more brutal. Residency consists of long hours, night calls, legal responsibilities, and more. Not to mention, by then, family is in the mind of many residents. The stress that a physician scientist bears is quite evident then, and serves as a strong deterrent. Physicians employed by hospitals or in private practice already struggle to see all the patients they need to attend to each day. Those who do conduct research are under the additional stress of running a lab, along with having to produce results to secure funding for their lab.
AGA workshop provides MD/PhD trainees a full scope of the opportunities in academic gastroenterology

Jeffrey Singer, MD-PhD Candidate, University of Alabama

There are no buts about it; a career in gastroenterology (GI) offers outstanding opportunities for physician-scientists. This was the message of the American Gastroenterologist Association (AGA)-sponsored workshop for MD/PhD trainees held this past March at the historic Hotel Del Coronado in sunny San Diego. Over two-dozen trainees from across the nation, 11 of whom are APSA members, convened for the weekend.

The program featured an accomplished panel of physician-scientists and GI researchers from academic institutions across the nation. Topics ranged from “Clinical and basic research opportunities in GI” to “How to make the most out of your post-doc” and everything in between. One particularly illustrative talk by Dr. Averil Ma MD, PhD highlighted the extensive variety of basic science fields with direct clinical relevance to gastroenterology. It certainly doesn’t take much imagination to conjure examples of how basic cellular and molecular processes in cancer, immunology, metabolism, biochemistry, microbiology, nutrition, physiology, genetics, neuroscience, and structural biology play integral roles in diseases of the intestine or biliary tract, or their treatment.

However, the opportunities in GI don’t end at its intersection with the basic biomedical sciences. The routine endoscopic procedures and biopsies performed by gastroenterologists provide direct translational research opportunities within the scope of normal clinical practice. Data collection is a part of daily practice in GI, as patient tissue samples, blood, and clinical data must be collected for disease prevention and management. Physician-scientist gastroenterologists are well positioned to utilize these sample banks and clinical databases in their research endeavors even if they are not the primary physicians collecting the data itself. As many investigators know, collaboration within a clinical department is often easier than across basic and clinical disciplines.

The AGA’s commitment to the career development of physician-scientists at all stages of their careers was also evident in the conference room next door to the MD/PhD student workshop. Here, new gastroenterologist-investigators met with their more established counterparts for personalized guidance as they embark on their academic careers and independent research programs. At the end of the day, MD/PhD trainees joined these early and senior GI investigators for dinner where a whimsical keynote address by Dr. Anil Rustgi, MD reminded the room (with the help of Pharell Williams) that the most important aspect of being an Academic Gastroenterologist is staying “Happy”. The elegant Victorian dining hall certainly seemed roofless with all the smiling faces at the end of the evening – a fitting conclusion for a day highlighting the boundless opportunities a career in GI holds.

This workshop offered a unique opportunity to meet, network, and learn from physician-

Updates from the Policy Committee, CCTS

Travis Hull, Vice-Chair, Membership Committee, University of Alabama

Capital Hill Advocacy Day 2014 was sponsored by the Coalition for Clinical and Translational Science (CCTS) as part of the annual meeting for the Association for Clinical and Translational Science (ACTS). This event was an outstanding opportunity for young trainees to explore the interface between biomedical research and the policy makers who fund it through allocation of taxpayer money to the National Institutes of Health (NIH).

The National Center for Advancing Translational Sciences (NCATS) is a Center at the NIH that was created to establish a codified home for clinical and translational research efforts across the NIH. The NCATS funds approximately 60 Clinical and Translational Science Award (CTSA) programs at academic medical institutions across the country. By awarding CTSA programs, the NCATS hopes to strengthen and support the entire spectrum of translational research to accelerate the process of translating scientific findings from bench to bedside. In addition, CTSA programs are intended to help a new generation of translational researchers attain the best training that is available. The CTSA program was established in 2006, at which time $750 million was decided upon as the annual amount necessary for program to achieve its highest potential. However, in fiscal year 2014, the CTSA was funded at only $475 million, dramatically limiting its ability to keep up with ever-increasing rate of inflation in science yet still realize its full potential within the scientific community.

The CCTS is a unified voice that advocates for the clinical and translation research communities by encouraging the government to allocate adequate financial support to biomedical research and the training of future translational scientists. At Hill Advocacy Day 2014, we spoke with congressional representatives about three broad issues that will directly influence the trajectory of scientific inquiry in the United States both immediately and for decades into the future. The first recommendation that we advanced on behalf of

(See CCTS Policy on Page 6)
Hello APSA members! This past year was an exciting first year for the undergraduate liaisons. Hoping to have another productive year, we have a new undergraduate liaison committee comprised of undergraduates, post-baccalaureates, and medical students. With these diverse perspectives, we hope to provide undergraduates and post-baccalaureates with resources and information on how to pursue an MD/PhD program. Our main goals for this year are to share our interest in becoming physician-scientists with others and inform more students about the possibilities and opportunities of a dual degree.

One of our initiatives this year is to help provide undergraduates the mentorship needed to be successful during their training. Another priority is to make the annual meeting an experience that will benefit undergraduates and expose students to biomedical research careers. By exposing undergraduates to resources within APSA, we hope to facilitate decisions about career development as physician-scientists.

If anyone has ideas to further the opportunities at the Annual Meeting or throughout the year we encourage you to contact us at leanne.dumeny@physicianscientists.org. Please let us know if you have any comments or needs that can help you in becoming an MD/PhD student. There is a need for physician-scientists and their unique perspective on medicine and research, and we would like to help as many students as possible realize opportunities and achieve success in this career. We look forward to a productive year ahead!

Undergraduate Liaison and Outreach
Leanne Dumeny, Undergraduate Liaison, University of Florida

A number of major initiatives are under the purview of the APSA Membership Committee this year. Because the goal of our committee is both to increase APSA’s membership and also to increase benefits offered to members, the initiatives are diverse.

You’ve probably heard either through social media or via email about the interactive sessions that we hold with prominent physician-scientists. These monthly Q&A-format audio sessions are an excellent time for trainees at all stages (undergraduates, professional-level students, and residents/fellows are all welcome) to ask questions of and interact with physician-scientists who have overcome the hurdles of training and have become successful in their diverse careers. Those we have hosted in the past include Drs. Barry Coller, Jaimo Ahn, David Ginsburg, Francis Collins, Robin Lorenz, Ken Kaushansky, and others. The sessions are recorded and are available to APSA members on the “media” section of the website (www.physicianscientists.org).

In addition to attending the APSA regional and annual meetings, we would also like to encourage you to be involved with your APSA local chapter. If you don’t have one, we have worked hard this year to create resources and advice that will help you create one. To help get the ball rolling on the local chapter at your institution, we offer a $100 grant for you to host your inaugural APSA lunch session. If you do create a local chapter, we encourage you to talk with your administrators about purchasing an APSA institutional membership, through which students at your institution will be able to receive APSA membership at a discounted price. I’d be happy to answer any questions about the purchase of an institutional membership.

An important initiative that we have begun this year is our mentoring program for undergraduates. The goal is to connect professional student (MD or MD/PhD) APSA members with undergraduate APSA members who are interested in careers as physician-scientists. The mentor-mentee relationship will last approximately one academic year, and we will provide guidance to mentors on talking points and give suggestions as we are able. If you happen to be at an institution that doesn’t have an APSA institutional representative and you would like to serve as one, please do not hesitate to contact me. The institutional representative serves as the APSA liaison to student/residents at a given institution, and is responsible for attending the APSA annual meeting in Chicago to vote at the business meeting. If you have questions or suggestions for me, please don’t hesitate to shoot me a message at peter.mittwede@physicianscientists.org.

APSA Membership Committee Update
Peter Mittwede, Chair, Membership Committee, University of Mississippi

APSA 2014 Annual Meeting
In 1902, Bertrand Russell wrote, “Mathematics, rightly viewed, possesses not only truth, but supreme beauty—a beauty cold and austere, like that of sculpture, without appeal to any part of our weaker nature, without the gorgeous trappings of painting or music, yet sublimely pure, and capable of a stern perfection such as only the greatest art can show.” Beautiful words by one of my heroes and also the pathetic opening to my medical school application essay in the summer of 2009. I did not even get the date correct, but it did not matter then and does not matter now. This is because this post is not about facts and figures: my comfort zone. This post is about emotions and the intangible.

As a reader of autobiographies, I am lucky because Bertrand Russell was a prolific writer and lived to age 97. In fact, in the final decades of this life, Russell wrote his autobiography in three volumes. The first volume covers birth to age 42 (1914), which encompasses his most seminal work, Principia Mathematica, also published in three volumes. Alfred Nobel did not have the foresight to establish a prize for mathematics and the Fields Medal is not awarded to anyone over the age of 40: feel free to do the math on Russell. However, he did receive the Nobel Prize in Literature in 1950 (a true polymath), which is unfortunately beyond the scope of the first volume that I wish to discuss.

When an autobiography exists, it has always fascinated me how little the great minds reflect on their “accomplishments”. In over 500 pages, Principia Mathematica is merely a few lines in Russell’s first volume. The rest is mostly obsession, infatuation, and love. To varying degrees, the same is true of James Watson (a few great stories about theft and epiphanies), Craig Venter (a paragraph or two about an epiphany on a plane ride), and so many more. Much of what these great minds instead choose to reflect on is love, sex, drugs, and mental illness.

In the interest of space, I must limit my discussion only to mental illness. What I wish to discuss is the complex relationship between mental illness and society’s perception of it. There exists a stereotype in our society of the “mad scientist”. Whether they suffer from mental illness or not, these people are “pardoned” for their eccentricities in the name of genius. However, many of these great minds, scientist or not, paid the highest price for their suffering: Nicolas Leblanc, Ludwig Boltzmann, Vincent van Gogh, Charlie Parker, and the greatest of them all, Alan Turing. I often wonder how much more each would have given back to society if they had lived even one more decade. Unfortunately, the story is very different in medicine. Society does not want “crazy doctors”. Thankfully, it seems the days of state licensing boards and medical training programs attempting to “weed out” mentally ill physicians has come to an end. Likewise, if they knew, patients might tolerate physicians with “minor” mental illness, such as major depressive disorder and generalized anxiety disorder. However, “major” mental illnesses with the potential for a psychotic component, such as schizophrenia and even bipolar disorder, would certainly be rejected. Ironically, Leblanc was both a...
Gastro (cont. from page 3)

scientists at every stage in their career. Full travel support, registration and lodging was provided by the AGA for all trainees interested in GI that were selected to participate. Thanks to a recent APSA/AGA partnership, more physician-scientist trainees than ever before were made aware of the opportunity, leading to a 50% increase in applications compared to previous years. Gastroenterologists from almost a dozen different institutions, each with their own unique training paths and experiences, shared their perspectives on what GI fellowships are like from top to bottom. So, if you have any interest in the bottom, the AGA’s MD/PhD Student Workshop is a great opportunity to learn more about dedicating your career to it.

2014 APSA/Lasker Award Lecture

APSA and Lasker Foundation Leaders celebrate the 2014 APSA/Lasker Foundation Lecture. From left: Claire Pomeroy (President, Lasker Foundation), Evan Noch (President, APSA), Eve Geneva (Chair, Board of Directors, APSA), Napoleone Ferrara (2014 APSA/Lasker Lecturer), Michael Guo (President-Elect, APSA)

CCTS Policy (cont. from page 3)

CCTS was to request that congress eliminate sequestration entirely, due to its significant threat to scientific inquiry in the US. In addition, we conveyed the importance of increasing the budget allocated annually to NIH by 6%, which would allow for the CTSA program to increase its budget to $500 million in FY2015. Lastly, we requested that Congress increase their support for “K” and “T” award programs at NIH to ensure that the US continues to be a good place for young investigators to pursue their scientific training and to start their career.

Participation in Hill Advocacy Day 2014 was highly rewarding and particularly eye opening. Congressional decision-making regarding the appropriation of funds to the NIH and its Centers such as NCATS will affect the culture and climate of biomedical research for decades to come. Currently, we appear to be at a crossroads wherein the US cannot continue to lead the world in biomedical discovery unless our government recognizes and comes to action on the importance of biomedical research and translational science. Generally speaking, the representatives who we met with stressed their support for clinical and translation research. However, a solution to the problems that currently face researchers in the United States was not so forthcoming. Our representatives are interested in hearing how the current difficulties in appropriations to biomedicine are directly affecting trainees. Therefore, it is important for our generation of aspiring physician-scientists to continue to advocate for our profession.
**MDs and Research (cont. from page 2)**

With all the stress that comes as a physician-scientist, why is it important to encourage medical students to conduct research? More physicians in research advances the field of medicine, allowing for treatment and care that improves quality and quantity of life. Physicians who decide to pursue research tend to do more clinically/translational research than pure PhDs. For clinical trials, it is a necessity to have a physician to administer experimental treatments.

Moreover, physicians have privileged access to treating patients. Caring for patients with a disease compared to reading about a disease are vastly different. Caring for a patient with disease instills a responsibility to get them better. Physicians can see first-hand what advances of medicine is needed to directly benefit their patients. When you see the limitations of medicine, it can serve as a powerful motivator to conduct research.

In addition, the privileged access to patients allows physicians to make discoveries not possible in the lab. The animal model of Parkinson’s was initiated by physicians who saw patients with drug-induced Parkinson’s. These patients were drugs user that inject synthetic heroin, MPTP (1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine). These patients developed Parkinson’s at an early age, and Dr. Langston, MD was able to make the link between MPTP and Parkinsonism. Current animal models of Parkinson’s disease use MPTP, which has allowed for more successful research.

More clinically relevant research also ensures better funding for research from the National Institutes of Health. The National Institutes of Health is an institute of “health,” so their metric for success is research that improves the health of the nation. There is a rich resource of basic science knowledge, but an untapped field of translational research that are suited for physicians. Physicians are in a position to make medical advances that produce more immediate results than basic science.

Physician-scientists are important intermediaries that help bridge research into practice. Not only do physician-scientists practice medicine (helping patients one by one), but they can change medicine for the better (impacting more patients than they will ever see in a lifetime). It is clear that physicians are making significant contributions to health research. It is imperative that we have physicians continue to do research, despite the challenges, to improve the health of our society.
Updates from the Policy Committee, CTSI
Aisha Siebert, MD-PhD Candidate, University of Rochester

This spring, CTSI trainees convened in Washington DC to lobby for biomedical research and education. The US government is now interested in funding work that brings the many advances in scientific understanding to patient care. Amidst the grumblings of new requirements imposed upon an already tight funding environment, many scientists approach this subject with trepidation.

Surprisingly, the response on the Hill is one of general – albeit cautious – enthusiasm about a greater degree of transparency in research. Perhaps best articulated by Eric James Deeble, V.M.D., Legislative Fellow to Senator Kristen Gillibrand (D, NY), lawmakers want to support scientific research but need help from scientists to convey the importance of their work to the public. The push towards funding translational research fits well within this paradigm – programs such as the Patient Centered Outcomes Research Institute (PCORI) and NCATS invite patients into the conversation from inception of research projects, making them stakeholders in the outcomes of that work. The design sets up investigators to ask relevant scientific questions within the patient populations that will benefit most from the outcomes.

Next to the recent boom in outcomes research, many "basic" scientists still feel left out in the cold. The work is equally important in advancing understanding of human health – in fact many advances in current medical care came from studies that would not fit the traditional definition of translational science. How the desire for tangible health outcomes can be married to a fundamental understanding of biological processes remains to be seen, but a logical first step in forging this partnership is advocacy. In order to transition into the globally competitive market of applied science the US government needs to invest in training biomedical researchers who can facilitate this alliance, and onus is on the trainees.

Lawmakers need to hear about the experience of current trainees to personalize the large budget line item that funds NIH. The recent 5.1% cut means not only slimmer lab budgets, but also fewer opportunities for trainees looking to further their career in the US. Many graduates are going abroad or even choosing to put their scientific careers aside to pursue more stable work. This not only places a tremendous drain on the pool of future scientific researchers but also limits ability to adapt to the new demands that research have both scientific relevance and translational potential.

There is momentum on Capitol Hill. The America Cures Act introduced by Dick Durbin (D, IL) in March of this year calls for increases in funding to the National Institutes of Health (NIH), Centers for Disease Control (CDC), the Defense Health Program (DHP), and Veterans Medical & Prosthetics Research Program at a rate of GDP-indexed inflation, plus 5% to make up for the recent cuts. Those we spoke with seemed optimistic, but need buy-in from the scientific community.

Policy Panel 2014
Policy Chair Jennifer Kwan (left) speaks with 2014 Policy Panelists

Start a discussion on this greatest of taboos. So, rather than descend into my rambling commentary, opinions, and “solutions”, I wish to end with an extraordinary story of hope from my own life experiences. In my first semester of college in “honors” general chemistry I befriended a random chemistry major and soon became deeply involved in our university’s chemistry society with him. As a physics major, I hated chemistry, but chemists were oh so much fun. Although I would come to spend many semesters in complete seclusion, he was the only person who could ever tolerate me as a roommate. I still don’t know how I always knew he had “problems”, but there were always so many more interesting things to discuss and do. It was not until I was bound for the prestigious Medical Scientist Training Program at Mayo Clinic and he declined a PhD chemistry spot at UPenn that I knew something was truly wrong. Although he would eventually pursue PhD training in Materials Science elsewhere, he left with a Master’s degree to pursue a career in magic. In recent years, I have watched him struggle to both pursue a career as a magician and also attempt to gain entry into highly competitive cognitive psychology PhD programs (an intertwined interest). However, in these years, I also learned of his struggle with schizophrenia with psychosis since high school and watched him (along with so many others) descend into romantic obsession, infatuation, love, and destruction. His magic career is now becoming increasingly successful and he is currently enrolled in a psychology Master’s program. More importantly, he is content with his life in a way few other people I know are. In my opinion, he is a great mind. Most burn out before achieving greatness. However, I suspect he will not.

And for those of you who made it this far in search of my own lifelong struggle with mental illness: my apologies. Unfortunately, there is just not enough space. Stay tuned for the autobiography…

Taboo (cont. from page 5)