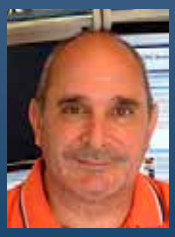
Genetics Society of America

reporter

Fall 2014

GSA welcomes new 2015 board members

VICE-PRESIDENT (and PRESIDENT-ELECT):
STANLEY FIELDS
Professor, Department of Genome Sciences, University of Washington, Seattle; Investigator, Howard Hughes Medical Institute (HHMI)



DIRECTOR:
FERNANDO PARDO-MANUEL DE VILLENA
Professor, Associate Chair for Research; Department of Genetics, University of North Carolina at Chapel Hill

DIRECTOR:
CRAIG PIKAARD
HHMI-GBMF Investigator; Carlos O. Miller Professor, Department of Biology and Molecular & Cellular Biology, Indiana University, Bloomington

DIRECTOR:
DEBORAH YELON
Herbert Stern Professor of Biological Sciences; University of California, San Diego

Each of our new Board members will begin a three-year term on January 1, 2015. GSA is also very grateful to our Board members whose tenures end on December 31, 2014 – Past President **Michael Lynch** (Indiana University), Directors **Marnie E. Halpern** (Carnegie Institute for Science), **Mohamed A. F. Noor** (Duke University), **John C. Schimenti** (Cornell University), and the inaugural trainee representatives **Kathleen Dumas** (Buck Institute) and **Krista Dobi** (Memorial-Sloan Kettering Cancer Center) – for their dedicated service.

From non-coding to coding to pervasively translated: searching for gene functions

Andrea Pauli

Andi is a postdoc in Alexander Schier's lab at Harvard University's Department of Molecular and Cellular Biology. She is also the 2014 recipient of the Chi-Bin Chien Award, which was presented to her by the zebrafish community at GSA's 11th International Conference on Zebrafish Development and Genetics, held June 24–28, 2014 in Madison, Wisconsin.

When I started my postdoc, it had just become apparent that most of the genome is transcribed at some point in an organism's life. Yet the significance of this 'pervasive transcription' was (and in fact still is) one of the biggest mysteries in biology. Do these transcripts have a function? And if so, what are they doing? I was inspired by these questions and set out to identify and functionally characterize unannotated transcripts expressed during embryogenesis.

In an effort to distinguish coding from non-coding transcripts in zebrafish, we discovered not only hundreds of long non-coding RNAs (lncRNAs)[1,2], but also hundreds of protein-coding genes that were either unannotated or incorrectly annotated as non-coding RNAs[3]. The identification of such a large number of unannotated protein-coding genes was unexpected, since uncharacterized transcripts had generally been assumed to be non-coding [*i.e.*, lacking a protein-coding open reading frame (ORF)]; yet our experiments

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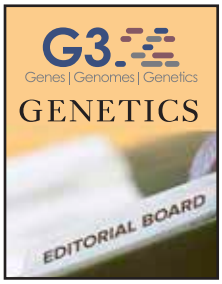
photo by Dan Koestler



Genetics Society of America

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From the Executive Director

Adam Fagen

As you will read throughout this issue of The *GSA Reporter*, it's been a busy time at GSA. Our sixth GSA conference in 2014 recently wrapped up, and we are looking forward to four more meetings in 2015. These conferences provide a venue for sharing cutting-edge research, connecting with colleagues from around the world, and enabling scientists at all stages to advance their careers.

We are also well into planning for The Allied Genetics Conference (TAGC), a special event that will co-locate meetings of seven genetics and model organism communities: *C. elegans*, ciliates, *Drosophila*, mouse, yeast, zebrafish—and a new focal area in population, evolutionary, and quantitative genetics.

TAGC is not really one big conference, but a connected set of individual meetings, each of which will have its own scientific program—including plenary, platform, and poster sessions—that will be developed by members of the community, the same as always. These will be the regularly scheduled 2016 meetings for each group. But each individual meeting will happen alongside other similar conferences, and there will be the opportunity to attend sessions and network with participants across all of the constituent meetings.

As a special event, however, TAGC is intended to be more than the sum of its parts, so the individual meetings will be supplemented by a small number of cross-cutting keynote sessions that will bring the entire community together. The TAGC Coordinating Committee, with representatives from each of the participating communities, has planned these joint sessions so that the topics and speakers will be of broad interest. We are extremely pleased that all 14 scientific leaders invited to be keynote speakers accepted our invitation. A full list of the keynote speakers may be found on page 8 of this newsletter.

In addition to cutting-edge science, TAGC will include a robust set of career development activities to help members at all stages of their careers and offer many opportunities to come together within and across communities. TAGC will provide an unprecedented chance to network with colleagues from a number of different systems, develop collaborations, find the next step in your career, and just enjoy the company of a broad cross-section of geneticists and model organism researchers.

TAGC will be held July 13–17, 2016, in Orlando, Florida. The location was chosen because it can house all of the meetings under one roof and offers low housing rates as well as convenient, affordable travel options. Be sure to check out the conference website—genetics2016.org—for additional details and information on how you can be a part of this important event for our community. We look forward to seeing you there.

President's letter

Wow, how time does fly. I can't believe eleven months of my time as GSA President have gone by. The past two years as Vice-President and President have been a great learning opportunity for me and I have been impressed by the many things GSA does for its members and genetics more broadly.

Vicki Chandler

GSA has recently opened the 2015 membership year, and I want to encourage you to submit your renewal as soon as possible. I hope you will also encourage your colleagues and trainees to renew their membership—and if they aren't already members, to join the Society for the first time. Together we can have a powerful voice for the genetics community, helping represent the interests of our members worldwide. Plus a larger membership base allows us to provide more valuable services for our members. Our society is strong with a growing membership and expanding set of activities. Yet we know there are more people who would benefit from joining the GSA community.

Indeed, recognizing the importance of education across all levels for our field, GSA has launched a new membership category for K–12 teachers and community college faculty. We hope this new membership category will help attract even more GSA members who focus on education. We encourage all of our members to take advantage of our growing set of activities that help with teaching and learning, such as the following: educational Primers published in *GENETICS*, that make it easy to use primary research literature in the classroom; GSA PREP, the Society's growing peer-reviewed education resource portal; and our editorial partnership on the publication of *CBE–Life Sciences Education*.

So why do I believe it is so valuable to be a member of GSA? Below I use this letter to answer that question.

One important function of GSA is to speak with one voice to advocate for changes that will benefit our research and education enterprise. GSA has greatly expanded our activities related to advocacy. In the past year, GSA leadership and member committees have worked to develop and submit a series of letters and statements to federal agencies that are developing policies and practices that have potential to impact our community. For example, we have strongly encouraged NIH's National Institute of General Medical Sciences (NIGMS) to enhance its focus on investigator-initiated basic research and the essential infrastructure needed to support this research—priorities that are resonating with NIGMS. We have encouraged the National Science Foundation (NSF) to allow individuals to remain at their graduate institution for a postdoctoral fellowship when the position would contribute to the individual's breadth of training; NSF has indicated they will revisit this requirement. We have provided feedback on the U.S. Department of Agriculture's Plant Breeding roadmap and encouraged the agency to better engage the basic research community and to stress investigator-initiated opportunities. And we have stressed to Congress the importance of fundamental discovery and the essential role of model organisms in advancing our understanding of human disease. See page 10 for more information about these and other advocacy activities that GSA's officers, Board members, members and staff have carried out.

The Society puts a high priority on the career development of our students and postdocs, who now make up more than half of the GSA membership. This includes the new Trainee Bootcamp at GSA conferences and other career development activities to help prepare trainees for a wide range of careers. Activities in this category also include supporting and promoting our members in their activities; see, for example, articles in this issue on science outreach (p. 5) and advice for women in science (p. 4), each of which was written by a graduate student member. GSA also developed GeneticsCareers.org, a completely free jobs board that helps match qualified job seekers with career and training opportunities across all areas of genetics.

We also provide direct support to our members for attending meetings. For example, we offer GSA Undergraduate Travel Awards to assist our undergraduate members in presenting their research at GSA conferences—and the DeLill Nasser Award for Professional Development in Genetics, which supports travel costs for graduate students and postdocs to attend national and international meetings and enroll in laboratory courses. The recipients of the most recent rounds of both of these awards are featured on page 19 of this issue.

Another important role for a society is to provide honor and recognition to outstanding members whose achievements we celebrate. Stay tuned for announcements of the winners of this year's Society awards later this year.

We are continuing to innovate in publishing, helping you share your science in GSA's two peer-edited journals: *GENETICS* and *G3*. Both journals are continually innovating as well as expanding their editorial boards to reflect the

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Welcome to new GSA staff members

Raeka Aiyar, PhD, has joined as GSA's new **Communications and Engagement Manager**, where she is working to strengthen the Society's communications activities—including social media, press, newsletters—and to engage the membership in many of these. Raeka has a BSc from the University of Waterloo (Canada) in Biology and Bioinformatics and obtained her PhD in 2010 from the European Molecular Biology Laboratory (EMBL Heidelberg, Germany) in the lab of GSA member and *GENETICS* and *G3* Editor Lars Steinmetz. In addition to her diverse track record in genetics research (functional genomics, transcription, yeast genetics, bioinformatics, synthetic biology), she brings several years of experience in science communication and outreach. Raeka's interests in promoting and fostering quality genetics research, engaging with researchers worldwide, and advocating for scientists align with GSA's mission to support the genetics community. Please contact her at raiyar@genetics-gsa.org with your suggestions!

William Anderson has joined as the **Web Designer** for GSA and our sister society ASHG, the American Society of Human Genetics, where he handles everything from email blasts to designing and developing GSA webpages. Hailing from Silver Spring, MD by way of Washington, DC, William graduated from Bowie State University with his BA in Fine Arts with a concentration in Computer Graphics/Graphic Design. He brings a wealth of diverse artistic knowledge and graphic design know-how to the Society. He has worked as a desktop publisher, web publisher, web developer, e-commerce coordinator, web designer, graphic designer, illustrator, production artist, web specialist, and front-end developer at companies ranging from small start-ups to major enterprise-level corporations. "I have a deep passion for web and graphic design," says William. "As an artist and designer I am not here to just point, click, and make things pretty, but to deliver our messages through the best design principles and practices."

SUPPORTING WOMEN on the tenure-track — *4 ways PIs can help*

Lauren Dembeck

Lauren Dembeck is a GSA Trainee Representative and a PhD student in Trudy Mackay's lab at North Carolina State University studying the quantitative genetics of adaptation and speciation in Drosophila.

In the life sciences, there are now more female than male undergraduate and graduate students; however, with each subsequent academic transition, more women drop out of the running for a tenure-track faculty position. This phenomenon referred to as the "leaky pipeline" is evidenced by women holding a mere 18% of full professor positions in the biological sciences[1]. Furthermore, Sheltzer and Smith recently published a study in the *Proceedings of the National Academy of Sciences* demonstrating that elite male principal investigators tend to employ fewer female students and postdocs[2]. Given that academic pedigree and university prestige are important factors in university hiring decisions, this deficit may negatively impact the number of women hired for assistant professor positions. While we seem to have succeeded in encouraging girls to study biological sciences at the undergraduate level, we still have much work to do in keeping those women in science past the graduate student level. Here are a handful of ways that professors can support women in pursuit of tenured professorship[2]:

Advocate for family support services on campus and flexibility from funding agencies. Female PhDs frequently cite marriage and childbirth as the primary reasons they opt out of an academic career[3]. In addition to the physical burden of childbirth and recovery, childcare is an extreme financial burden. For example, in 2010, the average annual cost of fulltime daycare for an infant in the U.S. was $11,666[4] – 36% of the NIH postdoctoral stipend and nearly half of most graduate student stipends[5,6]. By offering subsidized, on-campus childcare, universities would simultaneously increase their attractiveness to high quality

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Making an impact outside of the lab: *How to get involved in science outreach*

Sama Ahmed

In 2009, as a first-year graduate student at UCSF, I launched a science podcast called *Carry the One Radio*. My goal was to give non-scientists a chance to hear about new and exciting science straight from researchers. Every two weeks, I interviewed a scientist about their work and motivations for pursuing an academic career. Episodes were short, approximately 10-15 minutes long, and revealed what drives discovery: human ingenuity, creativity, and enthusiasm for science. I received a lot of positive feedback from both listeners and guests, and invited fellow classmates to help me interview scientists and produce the show. This first foray into science communication gave me the opportunity to connect and interact with numerous researchers whose dedication to science outreach is redefining what it means to be a scientist.

Carry the One Radio has allowed me to publicize and communicate ongoing research to diverse communities, to share my passion for lab-work, and to help other scientists achieve their own outreach goals. Over the last five years, the podcast has grown tremendously, such that it now serves two unforeseen functions: (1) it has become a platform for scientists to speak to the public, and (2) it trains young scientists on ways to communicate their research to a lay audience. The show is now operated by more than fifteen people, mostly scientists at UCSF, who are engaged in different forms of outreach through the program.

Fortunately, you do not have to start, or join, a science podcast to do outreach. Indeed, there are many ways to contribute, and the barrier to entry is small.

Sama (center) is a neuroscience PhD candidate in the lab of Nirao Shah, at the University of California in San Francisco. He cares deeply about lab work and increasing public understanding of the sciences. He is pictured above receiving the DeBakey Science Journalism Award, with Youreka Science and The Science Policy Group at UCSF.

With social media, more scientists are connecting with the public and with other scientists worldwide. Twitter especially has become a hub for scientists to communicate their work, share ideas, and set up scientific collaborations. There, you can connect with many scientists with unique outreach goals and projects. For example, Brad Voytek (@BradleyVoytek) teaches neuroscience to the public by highlighting neurological changes in the "zombie brain". Hopi Hoekstra (@HopiHoekstra) shares her lab's work and interesting papers on evolutionary biology. Morgan Jackson (@BioInFocus) is a self-professed insect nerd who explains big ideas about the natural world through his blog, *Biodiversity in Focus*. And Danielle Lee (@DNLee5) pushes for diversity in STEM fields through her writing at *The Urban Scientist*. Through social media, you can talk to these scientists directly about their work and pick their brains on how to best accomplish your own outreach goals. You can also join a science outreach community, such as *ScienceSunday* on Google+ or the curated Twitter account @RealScientists.

And there are many more ways to jump in. For example, you can guest-write a science blog, teach at your local high school, or grab a drink at a local science happy hour such as *Nerd Nite*. Even *Carry the One Radio* is an option for you; indeed, many of this year's episodes are one-off contributions by people outside of the core production team.

Because science outreach comes in myriad flavors, the most important first step is to identify your outreach goals: Do you want to transform science policy? Train young scientists? Educate the public about the scientific process? Once you identify your interests, the next step is to find scientists who are making strides in the direction you care about. Talk to them and ask how you can get involved. As I have pointed out above, social media is an easy way to find collaborators, but there are also plenty of other online science communities to get you started (*e.g.,* reddit.com/r/science). Your own community likely has a base of scientists who are committed to outreach. For example, UCSF has a Science Policy Group that focuses on science education, outreach, and more. Your best chance is connecting with other scientists who share your goals and passions. That is how I got my start. It works, and is easier than you might think.

To chat or contribute to Carry the One Radio, find Sama on Twitter @ColumboAhmed.

in the GSA journals

RESEARCH COLLECTIONS

The GSA journals' special-interest collections bring together *GENETICS* and *G3* articles focused on a common theme. Pre-submission inquiries for collections are welcome! Two new ongoing collections were launched this year:

Genetics of Sex: Focuses on the genetics of sex, including sex determination, sex chromosomes, mating and incompatibility systems, meiosis, and recombination. The first group of articles in the collection was published in the June issues of *GENETICS* and *G3*, accompanied by a Commentary by Michelle Arbeitman, Artyom Kopp, Mark Siegal, and Mark Van Doren.

Multiparental Populations: Covers QTL mapping in multiparental populations (MPPs) of both plants and animals, including the results of experiments using MPPs and methods for their analysis. The first 18 articles were published in September, accompanied by an Editorial by collection editors Lauren McIntyre and Dirk-Jan de Koning.

OTHER ONGOING COLLECTIONS:

Genetics of Immunity: Features articles addressing the broad reach and complexity of the genetics of immunity. Several articles from this collection were published in June, along with a Commentary by Brian Lazzaro and David Schneider.

Genomic Selection: Focuses on genomic selection, or genome-wide prediction, which was introduced in a landmark *GENETICS* article by Meuwissen *et al.* (2001). Read the accompanying Editorial by Lauren McIntyre and Dirk-Jan de Koning.

MORE GOINGS-ON.....

Have a timely result you want to publish quickly? Think *GENETICS' Communications!*
GENETICS is pleased to announce our new Communications article type, which provides a format for expedited publication of particularly significant and timely observations or advances. Communications receive the same rigorous peer review as Investigations, but ensure that authors can share time-sensitive results as fast as possible. Authors should first submit a pre-submission inquiry.

As peer-edited journals, *GENETICS* and *G3: Genes|Genomes|Genetics* are run by teams of practicing scientists. Meet the editors who have joined us in 2014!

New faces on the GSA journals' Editorial Boards

GENETICS

The influx of new appointments this year reflect *GENETICS'* renewed focus on the areas of genomics, human genetics, and methods, among other fields.

"The newest members of the board bring cutting-edge expertise and reflect the changing, interdisciplinary landscape of our field, while exemplifying *GENETICS'* reputation for rigorous scholarship," said *GENETICS* Editor-in-Chief Mark Johnston (University of Colorado School of Medicine). "They're already adding to the momentum of the journal's transformation over recent years."

Two former Associate Editors have also taken on Senior Editor roles to lead the journal's expanded coverage of methods and technology development:

STANLEY FIELDS
University of Washington & Howard Hughes Medical Institute
GENETICS Senior Editor, Methods, Technology, and Resources

GARY CHURCHILL
The Jackson Laboratory
GENETICS Senior Editor, Statistical Genetics and Genomics

The new Senior Editors are joined by several Associate Editor appointments this year:

HUGO J. BELLEN
Baylor College of Medicine & Howard Hughes Medical Institute
GENETICS Associate Editor, Developmental and Behavioral Genetics

GEORGE M. CHURCH
Harvard Medical School
GENETICS Associate Editor, Methods, Technology, and Resources

ROBERT J. DURONIO
University of North Carolina at Chapel Hill
GENETICS Associate Editor, Developmental and Behavioral Genetics

MICHAEL FREITAG
Oregon State University
GENETICS Associate Editor, Gene Expression

AUDREY P. GASCH
University of Wisconsin-Madison
GENETICS Associate Editor, Gene Expression, & *G3* Associate Editor

SANTIAGO C. GONZÁLEZ-MARTÍNEZ
Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, Spain
GENETICS Associate Editor, Empirical Population Genetics

LOESKE E.B. KRUUK
University of Edinburgh, Scotland & Australian National University
GENETICS Associate Editor, Complex Traits

JAMES R. LUPSKI
Baylor College of Medicine
GENETICS Associate Editor, Genome Integrity and Transmission

ANDREW W. MURRAY
Harvard University
GENETICS Associate Editor, Genome and Systems Biology

SOHINI RAMACHANDRAN
Brown University
GENETICS Associate Editor, Theoretical Population Genetics

KATHRYN ROEDER
Carnegie Mellon University
GENETICS Associate Editor, Statistical Genetics and Genomics

SHYAM K. SHARAN
National Cancer Institute
GENETICS Associate Editor, Genome Integrity and Transmission

JAY SHENDURE
University of Washington
GENETICS Associate Editor, Methods, Technology, and Resources

LARS M. STEINMETZ
EMBL Heidelberg, Germany & Stanford University
GENETICS Associate Editor, Genome and Systems Biology, & *G3* Associate Editor

JASON B. WOLF
University of Bath, UK
GENETICS Associate Editor, Complex Traits

NAOMI R. WRAY
The University of Queensland, Australia
GENETICS Associate Editor, Complex Traits

G3
Genes | Genomes | Genetics

Since *G3's* launch in June 2011, its editorial board of academic experts has been instrumental in shaping the journal into a thriving forum for the publication of useful genetics findings and resources.

As the breadth of research published in the journal continues to grow, Editor-in-Chief Brenda Andrews (University of Toronto) has appointed two new Deputy Editors-in-Chief, who will contribute to the oversight of key sections:

DIRK-JAN DE KONING
Swedish University of Agricultural Sciences
G3 Deputy Editor-in-Chief, Complex Traits

STEPHEN W. SCHERER
The Hospital for Sick Children (SickKids), Toronto, Canada
G3 Deputy Editor-in-Chief, Human Genetics

Andrews has also appointed a new Senior Editor for *Population and Evolutionary Genetics and Genomics* who will spearhead the journal's efforts to strengthen coverage in this area:

STEPHEN I. WRIGHT
University of Toronto, Canada
G3 Senior Editor & *GENETICS* Associate Editor, Empirical Population Genetics

The new Deputy Editors-in-Chief and Senior Editor are joined by several new Associate Editor appointments:

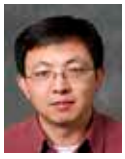
EDUARD AKHUNOV
Kansas State University
G3 Associate Editor

JAMES A. BIRCHLER
University of Missouri
G3 Associate Editor & *GENETICS* Associate Editor, Gene Expression

TIMOTHY J. CLOSE
University of California, Riverside
G3 Associate Editor

WILLIAM S. DAVIDSON
Simon Fraser University, Canada
G3 Associate Editor

ERICH GROTEWOLD
The Ohio State University
G3 Associate Editor



JIANXIN MA
Purdue University
G3 Associate Editor

KEVIN R. THORNTON
University of California, Irvine
G3 Associate Editor

"Genetics is a fast-paced field. The expanded editorial board will help us keep up with the growing volume and diversity of research being submitted to *G3*," said Andrews.

developments in the GSA journals

***GENETICS* and *G3* invite you to submit original images for our first ever Cover Art Contest!** One winning image will be selected for each journal and featured on the cover of an upcoming issue. Winners and runners-up will also be featured on postcards, the GSA Journals blog, GSA Facebook page, Twitter account, and website. Entries are due November 30.

***GENETICS* and *G3* are participating in an initial pilot for SocialCite, a qualitative citation measurement tool.** The GSA journals join The Rockefeller University Press (publishers of *Journal of Cell Biology*), the American Physiological Society, and *PNAS* in the program. The SocialCite toolbar appears in the Literature Cited sections of *GENETICS* and *G3* articles, where readers can provide information about why a reference is cited and rate the quality of the evidence cited. Authors will learn how their research is being cited, whether readers believe the research is high quality, and even whether their findings are possibly being distorted or misused.

***GENETICS* and *G3* want you to save your energy for doing research, not reformatting manuscripts:**

Flexible manuscript submission formats: submit your manuscript in any format! Save time and get your work sent for review faster.

One-touch manuscript transfer: Because *GENETICS* and *G3* are sister journals, submissions to *GENETICS* that report high-quality and useful findings—but lack the broad appeal, significance, or novelty of a published *GENETICS* article—may be offered a transfer to *G3*. This seamless process either guarantees review at *G3*, or *G3* editors will use *GENETICS* reviews to offer decisions within days.

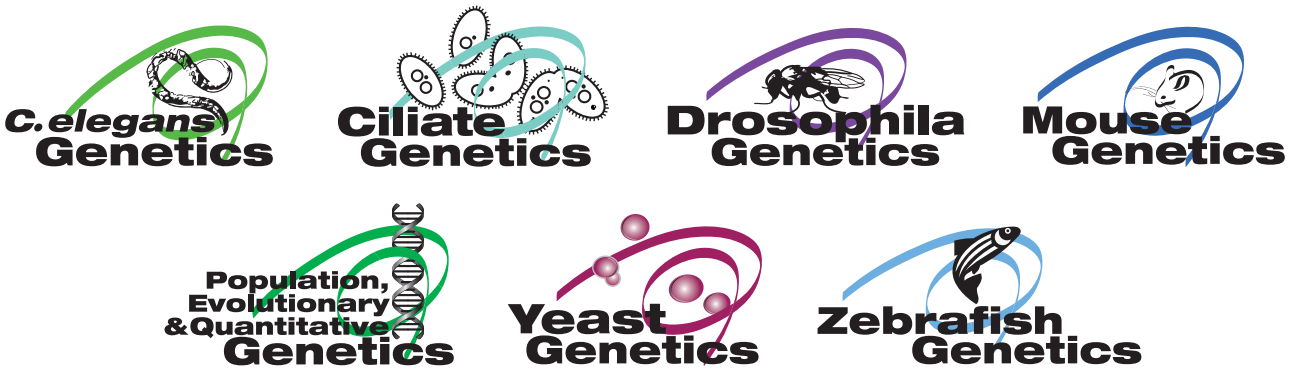
Got Mutant Screen Reports?
G3 wants to publish them! We offer a quick way to get your screens out there in the community, where others can find and use them. Check out the latest examples at www.g3journal.org.

Genetics Society of America

THE ALLIED GENETICS CONFERENCE 2016

ORLANDO, FL
JULY 13-17

CONCURRENT COMMUNITY MEETINGS • JOINT KEYNOTES
POSTER SESSIONS • EXHIBITS • NETWORKING • CAREER DEVELOPMENT



Keynote Speakers

Cori Bargmann (HHMI/Rockefeller)
Jef D. Boeke (NYU)
Francis S. Collins (NIH)
Hal Dietz (HHMI/Johns Hopkins)
Jennifer A. Doudna (HHMI/UC Berkeley)
Denis Duboule (EPFL/U Geneva)
Jeffrey I. Gordon (Wash U)
David M. Kingsley (HHMI/Stanford)
Svante Pääbo (MPI Leipzig)
Molly Przeworski (Columbia)
Pamela C. Ronald (UC Davis)
Amita Sehgal (HHMI/U Penn)
Shirley M. Tilghman (Princeton)
Leonard Zon (HHMI/Harvard)

TAGC Coordinating Committee

CO-CHAIRS:
Phil Hieter
Jeannie T. Lee

COMMUNITY REPRESENTATIVES:
Rebecca D. Burdine (Zebrafish)
Susan Celniker (*Drosophila*)
Kathleen Dumas (Trainee Representative)
Geoffrey Kapler (Ciliates)
Michael Lynch (Pop./Evol./Quant.)
John C. Schimenti (Mouse)
Michael Snyder (Yeast)
Paul W. Sternberg (*C. elegans*)

Bringing Genetics Together • July 13–17, 2016

www.genetics2016.org

Interview with

Adam Ruben:

Writer, Storyteller, Comedian, and Molecular Biologist

photo by Dan Foster

Surviving your PhD and what follows

Interview by Andrew Adrian, GSA Trainee Advisory Representative

Adam Ruben earned a PhD in molecular biology from Johns Hopkins University while performing stand-up comedy on the side. The outcome of his career is not just his dissertation, but also the book *Surviving Your Stupid, Stupid Decision to Go to Grad School*, a satirical guide to the low and lower points of post-baccalaureate education. Adam also writes the humorous "Experimental Error" column in *Science Careers*. When Adam isn't performing his routines at colleges and comedy clubs, he's working as a scientist at Sanaria, Inc. toward a cure for malaria. Adam currently resides in the Washington D.C. area with his wife and two children. Here, Adam talks with Andrew Adrian, Trainee Advisory Representative to the GSA Board, about his thoughts on the graduate education system and gives us a living example of how pursuing diverse opportunities can enrich the lives and careers of scientists.

Adam, thanks for taking the time to speak with us. Much of our membership can relate to your book* Surviving your Stupid, Stupid Decision to go to Grad School *(it's a great, quick read for all!) and it's always fun to make light of the quirks of graduate school, academia, and science in general. Why did you decide to go to graduate school in the first place?

A Basically, because I'm a nerd. If you're good at school, achieving the highest degree in the field just seemed like the thing to do. My field was molecular biology, so I never really wondered whether I'd attempt a PhD or not.

In your writing, you draw a lot from your graduate studies. How else has getting a PhD affected your life?

A I'd like to think it gives me instant credibility, though I'm not sure who I'm hoping will find me credible. It did keep me fairly busy from age 22 to 29. The process also taught me quite a bit, both about biology and about academia in general. I found myself pursuing other avenues at the university in my spare time—helping to pilot anti-plagiarism software, teaching writing classes, teaching summer classes to high school students, editing the graduate student newsletter. I think all of this showed me what I liked about academia and what I didn't—*i.e.*, what I'd be giving up by leaving the university after my PhD.

Do you regret going to graduate school?

A No, not really. First of all, I'm obligated to say that I'm glad I went, because I met my wife there. That notwithstanding, however, I'm still glad I went. I actually enjoyed many aspects of grad school, even as I complained about others. I think the hardest part of grad school was the final year or two, when I had no idea what I needed to do to graduate and how, or if, it would ever happen. I usually tell people who ask about the title of my book that just because I generally had a good time in grad school, that doesn't mean there aren't aspects of grad school that need to be fixed. Does there really need to be a mystery about when you'll graduate? Do stipends really need to be so low? Is it really necessary to train grad students directly for so many tenure-track professorships that don't exist, while only giving brief lip service to careers outside academia?

In your book, you stated that tenacity was the most important quality for being successful in graduate school; do you still maintain this position? And if so, do you think anyone who's stubborn enough can complete a PhD?

A I wouldn't say tenacity is as important as the ability to take control of your own academic destiny. We'll call it driver's-seatedness. Tenacity is just not quitting. Driver's-seatedness is not quitting, plus actively figuring out what you need to do to thrive. I didn't do that enough in grad school.

What advice would you have for discouraged and 'lost' graduate students?

A I don't want to say, "Hang in there," because maybe you don't want to hang in there, and maybe you'd be happier dropping out. I have a friend who was pursuing a PhD in history and dropped out after seven years. He's now a high school teacher, and he's very happy. So instead, I'd say hang in there if you really think you ought to hang in there. If you just feel like the sort of person for whom grad school is right—despite its flaws—you'll probably want to stick with it. Also, you can maintain your sanity by doing tangential activities outside of your primary research. I used to judge high school science fairs, not because it would help with my degree or because it looked good on my CV (it doesn't), but because it was neat, and I learned a lot by doing it.

You've had your second child recently—how big of a sample size are you going for?

A Probably just two. (And technically my wife had him.) There are days when he'll give a cute smile, and we'll start thinking, "We should have seventeen kids!" Then, a couple hours later, we can't get him to go to sleep, and we'll wonder how we're ever going to make it with two.

Would you encourage your children to be scientists?

A If that's what they love to do, absolutely. But I'd secretly, or maybe not-so-secretly, hope that they become the kind of scientists who don't run screaming from mandatory writing classes. I wouldn't want them to spend twenty hours a day in the lab. I'd hope they can somehow mix their science with the humanities; that way, they'll have perspective on the whole research process in which they're participating. Or maybe they'll become chefs or social workers or dancers, which is all fine with me, as long as they're healthy and happy. Just not law school.

For more information about Adam or to contact him, please see www.adamruben.net

GSA provides input on policy issues to Congress and federal agencies

Adam P. Fagen, GSA Executive Director

GSA has been busy over the last several months with a series of letters and policy statements offered on behalf of the Society to influence key decisions and decisionmakers.

NIGMS Strategic Plan

In March, GSA provided input to NIH's National Institute of General Medical Sciences (NIGMS) on their strategic planning process before the formal planning even began. The GSA White Paper (bit.ly/1teHH5M), prepared by an authoring committee appointed by GSA past president Michael Lynch (inset) and approved by the GSA Board, provided input on the two core missions of NIGMS—research and training—offering recommendations that GSA believes are most crucial for advancing the needs of the genetics community.

In the White Paper, GSA recommended that NIGMS:

• Increase the percentage of the NIGMS budget committed to research project grants like R01s;

• Put a sunset clause on non-investigator-based initiatives;

• Provide bridge funding for highly meritorious investigators to minimize damage to research teams caused by funding gaps;

• Prioritize funding of early stage investigators;

• Finance community resource centers such as stock centers and model organism databases;

• Evaluate its training programs to ensure they are meeting desired goals efficiently;

• Establish postdoctoral fellowships to support underrepresented minority scientists;

• Extend the eligibility clock for K99/R00 awards for those adding children to their families or dealing with other family medical issues;

• Avoid penalizing graduate training programs if students are receiving extra training that promotes their career development.

NIGMS released a draft of its strategic goals and objectives in September as it issued a formal request for information. The draft goals include a number of themes from the White Paper, including the focus on investigator-initiated research. GSA responded to endorse the draft goals and encourage additional focus on enhancing peer review (bit.ly/YJ56Eb).

Authoring Committee for White Paper on Needs in Genetics Research

Roger Innes (Indiana University), ***Chair***
Nels Elde (University of Utah)
David W. Hall (University of Georgia)
Denise Montell (University of California, Santa Barbara)
Anne Villeneuve (Stanford University)

Input to Congress on federal travel regulations

In January, GSA submitted testimony to the U.S. Senate Committee on Homeland Security & Governmental Affairs, expressing concern about the negative impact of restrictions on federal employee travel and conference sponsorship imposed in the wake of allegations of extravagant meetings organized by government agencies.

In its testimony (bit.ly/1qSYeum), GSA highlighted the value of scientific conferences including their essential role in promoting sharing, getting feedback on ongoing research, keeping up with the latest scientific developments, catalyzing new connections and collaborations, and providing a venue to learn about new disciplines or further one's career. The testimony described some of the ways that these regulations are being experienced in the community, with an especially dramatic impact on federal government employees—including both intramural researchers employed by federal agencies like NIH and program directors who oversee the federal investment in scientific research. GSA expressed concern that the restrictions "are preventing government scientists from being full and active participants in the scientific community" and "are leading to a reduction in efficiency and a reduced return on the nation's investment in research."

GSA thanks the many organizers of recent GSA conferences—and other members of our community—who provided helpful information about the impact of the new regulations.

Input to Congress on 21st Century Cures Initiative

In May, GSA provided input to the U.S. House Committee on Energy & Commerce on its 21st Century Cures Initiative, which is described as a "comprehensive look at what steps we can take to accelerate the pace of cures in America."

In its comments (bit.ly/1pEE7iZ), GSA focused on the importance of discovery, saying that "translational research simply cannot occur without a base of new knowledge and understanding of underlying biological mechanisms to translate." The Society expressed concern that declining investments in foundational research today will lead to a dry development and delivery pipeline in the future.

The letter to the committee provided several examples of how basic

research has led to improved medical treatments, to the development of new fields of study, and even to the entire biotechnology industry. GSA also highlighted the contributions of work in model organisms, which we described as "essential for advancing our understanding of human disease."

NSF Postdoctoral Eligibility

In April, GSA asked the National Science Foundation (NSF) to broaden the eligibility for Postdoctoral Research Fellowships in Biology (bit.ly/1pp4o5R). NSF has required applicants for postdoctoral fellowships to change institutions from their PhD university, which GSA believes to be too restrictive.

The letter to NSF agreed with the need to ensure that trainees gain broad perspectives and experiences, but pointed out that there are many institutions that offer the opportunity for continuing study in different departments, colleges, or professional schools: "In our experience, the training offered in such different venues within a large university can often fit the goal of diversification of training experiences as thoroughly as forcing a change in institutions."

GSA expressed particular concern about the impact of this requirement on applicants who may have geographic constraints—such as those in committed relationships where the partner may not be able to move and others who wish to remain in certain geographic regions or closer to family members.

GSA asked NSF to consider enabling individuals to remain at the same institution as long as the postdoctoral setting would provide the desired breadth of training. NSF responded in June, indicating that they "intend to remedy this requirement while still encouraging applicants to seek a postdoctoral experience at another institution whenever possible."

NIGMS MIRA

In August, GSA responded to an NIGMS request for information on its proposed Maximizing Investigators' Research Award (MIRA) program. This initiative, designed to increase the efficiency and effectiveness of grant funding, would support a lab's entire NIGMS research program, rather than individual projects. The renewable MIRA awards would be longer and larger than the average R01 and would offer additional stability by generally calibrating award levels at renewal, rather than cutting the grant entirely.

GSA was supportive of the objectives behind the MIRA program and appreciated the opportunity for PIs to be able to pursue promising new research directions without being bound by specific aims proposed in advance (bit.ly/1yyn7pb). The Society shared NIGMS' hope that the freedom offered by MIRAs, coupled with longer funding periods, would encourage investigators to pursue more ambitious scientific projects, especially those with longer timeframes. And we appreciated the stability afforded by not terminating a MIRA grant immediately if renewal is unsuccessful.

However, GSA expressed concern that the MIRA program might further concentrate constrained resources to a small number of investigators at a limited number of institutions. The Society also raised concerns about those who may not be competitive for the program, including those with small research programs and those whose work encompasses several seemingly unrelated projects that would be difficult to bring together in a single proposal. GSA pointed out the critical importance of an effective review process that can address not only an applicant's track record but the promise of a broad research agenda. GSA also stressed the importance of continually evaluating the MIRA program, so that it can be altered or tweaked as necessary.

NIGMS has acknowledged the comments from GSA and other stakeholders as it moves forward with a pilot next year.

USDA Plant Breeding Roadmap

In July, GSA responded to a request from the U.S. Department of Agriculture (USDA) to provide input on the agency's draft plant breeding roadmap (bit.ly/1pEExG4). GSA noted the enormous potential to develop plant varieties that can provide a greater yield of nutritious foods and healthy environments with fewer resources in less than ideal conditions. However, the Society felt that the roadmap was a missed opportunity to generate expanded interest in plant breeding and convey a sense of excitement that would help make the document compelling to those not already engaged in this field.

GSA encouraged USDA to better engage basic researchers, including those whose work may not be specific to ongoing plant breeding initiatives. The letter stressed the importance of enhancing our fundamental understanding of genetics and plant biology and suggested that USDA more fully embrace new technologies with a potential to dramatically improve the effectiveness of plant breeding. GSA emphasized the importance of community consultation and peer review in establishing agency priorities and encouraged USDA to partner with other federal agencies on areas of science relevant to plant breeding.

Finally, GSA pointed out an opportunity for USDA to develop training programs to help cultivate a strong pipeline of scientists who will take up these challenges.

From non-coding to coding to pervasively translated: searching for gene functions continued from page one

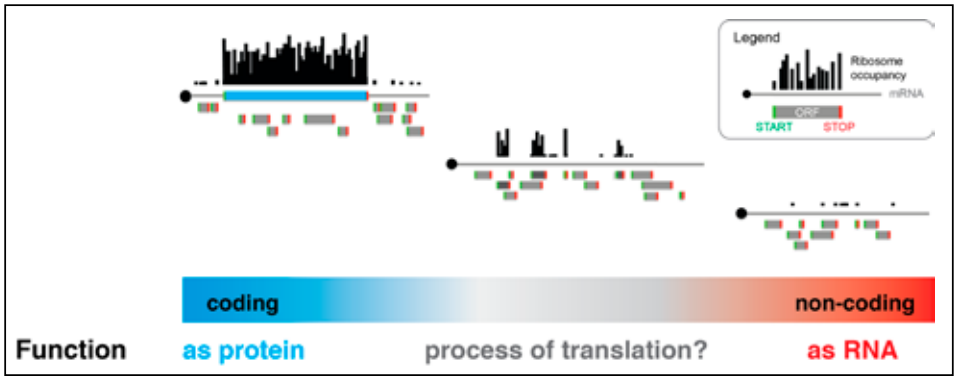
confirmed that these transcripts were indeed translated. To explore the potential function of these putative protein-coding genes, I focused on a highly conserved, merely 58-aa long candidate secreted peptide that we called Toddler (official gene name: *Apela*)[3]. We now know that Toddler has a very important role in development: it signals via the GPCR Apelin receptor to promote mesendoderm migration during gastrulation. In the absence of the Toddler peptide, zebrafish embryos do not develop a functional heart and die during embryogenesis[3]. Notably, the example of Toddler raised the intriguing possibility that functionally important yet uncharacterized peptides might have been missed by prior genetic screens and genome annotation efforts.

Apart from misannotated bona fide protein-coding ORFs, we and others have identified hundreds of translated ORFs of currently unknown functionalities (see below) in presumably non-coding RNAs [transcripts lacking annotated coding sequences (CDSs)] and in more than half of all 5' leader sequences (5'UTRs) of protein-coding genes [upstream ORFs (uORFs)][2-8]. In analogy to the well-established phenomenon of 'pervasive transcription', we and others have dubbed the widespread translation outside of annotated CDSs 'pervasive translation'[3,5].

What does 'pervasive translation' actually mean? There are two common misconceptions about pervasive translation that I would like to clarify up front and expand upon in more detail below: First, pervasive translation does not mean that the entire transcriptome is translated; rather, it refers to the unforeseen extent of translation, particularly of short uORFs in 5' leaders and of transcripts annotated as non-coding. Second, not every transcript that is translated necessarily generates a functional protein.

Mechanistically, pervasive translation appears to follow the same rules as canonical translation. Because translation occurs as a two-step process (ribosomal scanning precedes translation of a certain ORF), pervasive translation does not mean that entire transcripts are translated. The term 'pervasive' rather implies that any capped, polyadenylated, and cytoplasmically localized transcript can be encountered by a ribosome and has the potential to be translated. In other words, the translational machinery does not appear to have the means to distinguish transcripts that contain a long CDS (and generate functional proteins) from transcripts that do not appear to contain a bona fide protein-coding ORF (and might not generate functional peptide products). While any ORF defined by start/stop codons irrespective of conservation, length, and protein-codingness has the potential to be translated, there are clear differences in the translational efficiencies between ORFs even within the same transcript. For example, some uORFs are not translated at all, while others stand out by being as efficiently translated as the downstream CDS. Why certain ORFs are translated while others are omitted depends at least in part on the translation initiation context, but other factors like RNA-binding proteins are also likely to play a role. Overall, the emerging picture of pervasive translation resembles that of pervasive transcription: the whole genome has the potential to be transcribed, yet the transcription of a certain region at a given time depends on many factors like chromatin accessibility, nucleosome positioning, and transcription factor binding.

The arguably most compelling question regarding pervasive translation pertains to its putative function(s). Why would the cell expend the effort to translate all of these regions in the first place? For canonical protein-coding genes, the role of translation is obvious: translation generates the protein, the functional unit of the gene. Notably, some of the newly discovered products of pervasive translation, *e.g.*, the peptide Toddler/Apela introduced above[3,9], do in fact encode functional short peptides that had been overlooked by prior genome annotations due to their short ORF lengths[10-15]. While translation of an ORF will always generate a peptide product, it is currently unclear how many of these peptides are functional *in vivo*. In some cases, it might not be the peptide product but rather the process of translation itself that serves a purpose, *e.g.*, by regulating RNA stability. In other cases, translation might not be functional during the lifespan of a cell or organism, but it may play an evolutionary role, *i.e.*, by providing a pool of peptides upon which evolution can act to give rise



to potentially novel functionalities[16]. Lastly, some translational events might be effectively neutral, and might comprise 'noise' in the gene expression program.

The translational landscape has thus emerged through these recent studies as a spectrum: while some genes are clearly protein-coding and others are clearly non-coding (non-translated), there is a large 'gray zone' of genes with intermediate translational activities and currently unknown functionalities in between. Identifying the functional relevance of translating these genes is an avenue of research I am very excited about pursuing as an independent investigator. Just as interest in studying lncRNAs surged following the discovery of pervasive transcription when I started my postdoc, studying the mysterious products of pervasive translation may well take over the center stage in coming years.

I would like to thank all the members of the Schier lab for having made this endeavor possible and fun. In particular, I would like to thank Alex Schier for his continuous support, Eivind Valen, my collaborator throughout my postdoc, Guo-Liang Chew, who performed all ribosome profiling experiments, and Tessa Montague and Megan Norris for keeping up with me in the non-coding/coding jungle.

— Andi Pauli

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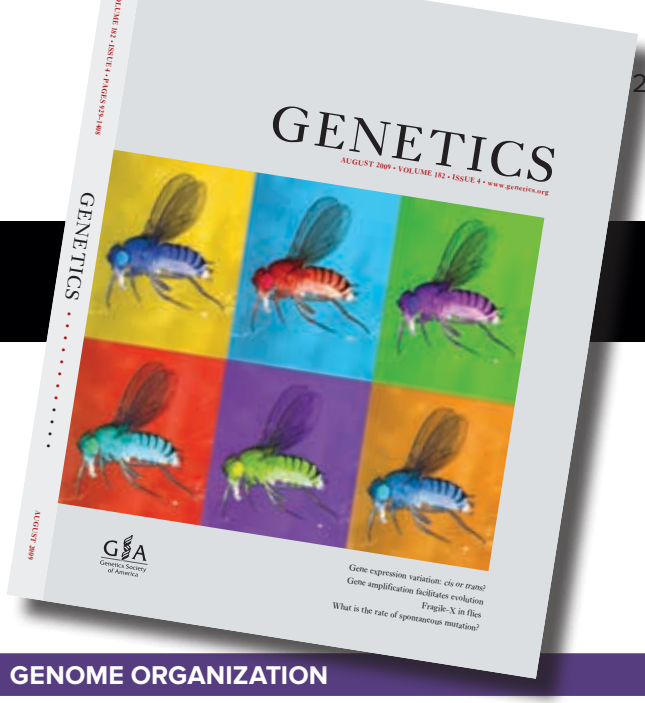
Get ready for FlyBook!



The Genetics Society of America (GSA) has announced plans to publish **FlyBook**, a compendium of review articles presenting the current state of research in *Drosophila*. Each month beginning in mid-2015, *GENETICS* will publish one or two **FlyBook** articles on various aspects of the biology, genetics, genomics, and evolution of *Drosophila*, which will comprise an encyclopedia of approximately 50-60 articles. The project reflects GSA's commitment to supporting fundamental research in model systems.

At the helm of **FlyBook** are co-Editors-in-Chief **Lynn Cooley** (Yale University), **R. Scott Hawley** (Stowers Institute for Medical Research), and **Teri Markow** (University of California, San Diego), who will collaborate with a select group of Section Editors, who in turn will invite experts and innovators to write peer-reviewed chapters.

"**FlyBook** will serve as the go-to reference for people entering the field, those shifting from one area of fly research to another, and for those, such as grant reviewers and graduate class teachers, who need to find information about another discipline," says Cooley.

Sections and editors include:

CELL SIGNALING

Marek Mlodzik, Icahn School of Medicine at Mount Sinai
Jessica Treisman, New York University School of Medicine

DEVELOPMENT & GROWTH

Trudi Schüpbach, Princeton University
Carl Thummel, University of Utah School of Medicine

ECOLOGY & EVOLUTION

Teri Markow, University of California, San Diego
Trudy Mackay, North Carolina State University

GENE EXPRESSION*

Brian Oliver, National Institute of Diabetes and Digestive and Kidney Diseases, NIH
Eileen Furlong, European Molecular Biology Laboratory

GENOME ORGANIZATION

Sue Celniker, Lawrence Berkeley National Laboratory
Gary Karpen, Lawrence Berkeley National Laboratory/University of California, Berkeley

METHODS

Norbert Perrimon, Harvard Medical School/Howard Hughes Medical Institute
Hugo Bellen, Baylor College of Medicine/Howard Hughes Medical Institute

NERVOUS SYSTEM & BEHAVIOR*

John Carlson, Yale University
Jim Truman, Janelia Farm Research Campus/Howard Hughes Medical Institute

REPAIR, RECOMBINATION, & CELL DIVISION

Scott Hawley, Stowers Institute for Medical Research
Terry Orr-Weaver, Whitehead Institute/Massachusetts Institute of Technology

STEM CELLS & GERMLINE

Ruth Lehmann, New York University School of Medicine/Howard Hughes Medical Institute
Allan Spradling, Carnegie Institution for Science/Howard Hughes Medical Institute

*Inaugural sections

Read more about the project at www.tinyurl.com/flybook.

MEMBER PROFILE

ETHAN O. PERLSTEIN

Indie Scientist, Founder & CEO of Perlstein Lab, PBC

Born: Ft. Lauderdale, FL

GSA member since 2010

"Perlstein Lab is on a mission to solve orphan disease puzzles using genetic model organisms like yeast, worms, flies and fish."

What would you like to see the Society do for its members?

I would like to see more connections made between model organism genetics and human genetics, including more bridges between patients and their advocates and scientists.

What scientific discovery do you wish you'd made?

I wish I could have been one of Thomas Hunt Morgan's graduate students at Columbia 100 years ago.

What do you like to do in your spare time?

Tweet (@eperlste).

Where to publish educational materials

Beth Ruedi, GSA Director of Education and Professional Development

Whether you are heavily involved in education research, an expert at guiding undergraduates through their first primary literature paper, or have developed an exciting student-centered laboratory for your own classroom, GSA is pleased to offer several options for the publication of educational materials:

Peer-Reviewed Education Research

CBE—Life Sciences Education (LSE) publishes peer-reviewed articles on education across all life science disciplines at the K-12, undergraduate, and graduate levels. GSA has joined with the American Society for Cell Biology as an editorial partner supporting the publication of *LSE*.

What does *LSE* publish?

Among many other things, *LSE* publishes:

- Assessment techniques
- Education research on effective teaching methods with rigorous assessment data
- Research examining appropriate measurements of learning
- Research exploring how students learn
- Research identifying common student misconceptions

How is *LSE* different from GSA PREP or Primers in *GENETICS*?

- Hard assessment data must usually be present demonstrating learning and/or retention
- Focus is education research, sometimes theoretical; not usually ready-to-use resources
- Like *GENETICS*, *LSE* is indexed in PubMed and has an excellent reputation in the community

How to submit: Visit the *LSE* website at www.cellbiologyeducation.org.

GSA is happy to announce a **new membership category** for K-12 educators and community college faculty! Please reach out to the educators you know and invite them to join the GSA community.

Peer-Reviewed Education Resources

Launched in 2012, the **GSA Peer-Reviewed Education resource Portal (GSA PREP)** is an online publication featuring peer-reviewed educational resources designed for immediate use in the classroom. GSA PREP resources promote the principles of inquiry-based, student-centered learning based on core concepts and competencies in genetics.

What does GSA PREP publish?

- Full laboratory or lecture courses
- In-class/lecture exercises
- Laboratory exercises
- Laboratory protocols
- Images/animations

How is GSA PREP different from *LSE* or Primers in *GENETICS*?

- Designed to publish resources educators can use immediately or modify for their own classes
- Not an outlet for education research—no assessment data is necessary, though each submission must include a resource justification
- Peer-reviewed for completeness, usefulness, and coverage of core concepts and competencies
- GSA PREP resources are catalogued in several online repositories, including LifeSciTRC, BioSciEdNet, and the National Digital Science Library, providing a large audience for your publication
- Original GSA PREP resources are citable and have Digital Object Identifiers (DOIs), but GSA PREP is not indexed in PubMed

How to submit: Visit the GSA PREP instructions for authors and reviewers at www.genetics-gsa.org/education/GSAPREP_authorreviewer.shtml.

Educational Primers

Launched in 2012, **Primers** are a series of articles in the GSA journal *GENETICS* designed to make current research articles useful in an undergraduate classroom. Primers are roadmaps that aid instructors wishing to use peer-reviewed articles as a vehicle to develop core competencies in genetics.

What Primers does *GENETICS* publish?

- **Research Primers** are tied to a current article in *GENETICS* and lay out necessary background, explain the hypothesis or approach, describe the methodology, guide the readers through the results, and summarize the discussion.
- **Model Organism Primers** describe a genetic model system, including the organism's life cycle, history of its use in the laboratory, available genetic and genomic tools, advantages of the system, discoveries made using the model organism, and more.

How are Primers different from LSE or GSA PREP?

- Articles are typically solicited and serve a very specific purpose
- No assessment data or resource justification required
- Published in our Society's journal *GENETICS*
- Primers are indexed in PubMed along with all other articles in *GENETICS*

How to submit: Email the Primer Editor, Elizabeth De Stasio, at elizabeth.a.destasio@lawrence.edu to inquire about authoring a Primer.

journals in the news

"SCIENTISTS SEQUENCE A GENOME SEVEN TIMES BIGGER THAN YOURS"

—*Christian Science Monitor*, March 20, 2014

Sequencing the 22 Gb loblolly pine genome was a mammoth task that forced the authors of two articles in the March issue of *GENETICS* to develop new genome assembly methods. The achievement received international media attention, including coverage by *The Scientist, Nature, Science*, GenomeWeb, *Science News*, NBC News online, CBS News online, *Der Spiegel, Die Welt, Science China Press, Popular Science*, Live Science, *Huffington Post*, PBS Nova Next, *Christian Science Monitor*, IFLS, and Io9.

Sequencing and Assembly of the 22-Gb Loblolly Pine Genome. A. Zimin, K.A. Stevens, M.W. Crepeau, *et al.* ***GENETICS*** March 2014 196:875-890

"CARLSBERG RESEARCHERS SEQUENCE LAGER YEAST"

—*Ingeniøren*, May 25, 2014

In the May issue of *G3*, Walther *et al.* described the genome and evolution of *Saccharomyces carlsbergensis,* the strain that kick-started the industrial-scale lager business. Their conclusion that all lager yeasts derive from a single ancestral hybrid was covered by *The Scientist, Frankfurter Allgemeine Zeitung, Brookston Beer Bulletin*, and the Danish magazine *Ingeniøren*.

Genome Sequence of *Saccharomyces carlsbergensis*, the World's First Pure Culture Lager Yeast. A. Walther, A. Hesselbart, and J. Wendland. ***G3: Genes|Genomes|Genetics*** May 2014 4:783-793

"RESEARCHERS EMPLOY HI-C METHOD TO PICK OUT AND CONSTRUCT MICROBIAL GENOMES FROM METAGENOMIC SAMPLES"

—GenomeWeb, June 3, 2014

Applying Hi-C to metagenomic samples can reconstruct genomes of the individual species and create scaffolded eukaryotic assemblies, reported Burton, Liachko, *et al.* in July *G3*. The biotechnology press took note of this big technical advance, with in-depth coverage appearing in *The Scientist, Bio-IT World* and GenomeWeb.

Species-Level Deconvolution of Metagenome Assemblies with Hi-C-Based Contact Probability Maps. Joshua N. Burton, Ivan Liachko, Maitreya J. Dunham, and Jay Shendure. ***G3: Genes|Genomes|Genetics*** July 2014, 4:1339-1346

ASK A PI:
Tips on giving a great talk

Krista Dobi, GSA Trainee Advisory Representative

For over 30 years as a professor at Harvard Medical School, Fred Winston has advised countless students and postdocs on giving good presentations. We asked him to share some of his best advice.

"A great presentation is one that begins by clearly explaining what you're going to talk about and justifying why it's important; then clearly informing the audience of what each experiment is, why it was done, and what you concluded; and finally, clearly summarizing the work and placing it in a larger context," he says.

On slide style: Dr. Winston stresses the importance of making slides easy to read. Make sure the font is large enough (bold fonts help), and remember that fancy fonts can be distracting or hard to read. Beware of color choices that don't provide enough contrast and make things hard to see from the back of the room. "If you have too much text and make your sentences too long, your audience will not pay attention to you. Keep text brief, using phrases instead of full sentences because that will be easier to follow."

On slide content: Winston suggests limiting yourself to one experiment per slide. Use a descriptive title and clear labels, and "never use a figure directly from a paper," particularly one in which you are focusing on only one panel. A good rule of thumb is, "If you are going to say 'I know you can't read this but…,' then don't show the slide." Make sure you justify your experiments, and point out strengths and weaknesses.

On keeping to time: "Keeping to time is very important. People stop listening once you go over time." Winston points out that, "Going over time is selfish [because it suggests that] your results are more important than your audience's time. A 15-minute talk is not a 60-minute talk given very fast; it is a talk with less content. Rehearsal is very important for keeping to time."

On feeling nervous: "Nervousness is something that everybody faces, even PIs. I still get nervous when I give talks." Winston suggests visiting the room where you will give your talk, getting a feel for what it's like to stand at the podium, and familiarizing yourself with the pointer and slide advancer. "The best advice I can give is to prepare carefully and rehearse your talk many, many times. I don't recommend memorizing your talk, but I do recommend memorizing the first sentence or first few sentences. For most people, once the talk starts the nervousness starts to go away."

Winston's most important piece of advice? "Rehearse, rehearse, rehearse!"

SUPPORTING WOMEN continued from page four

researchers and lessen the financial burden for cash-strapped female graduate students, postdocs, and young faculty members.

Additionally, while there are maternity extensions available for individual fellowships, there is no such extension for grants. GSA Board member Mohamed Noor of Duke University, who has mentored many successful female trainees, suggests that to ease the pressure on both PIs and postdocs or students working on a grant-funded projects, funding agencies could add an automatic 3-month extension to the grant if a student or postdoc working on that project has or adopts a baby.

Contact your colleagues to help with the "two-body problem". 83% of female scientists have partners who are also scientists and a quarter of female PhDs marry PhDs[3]. In the highly competitive field of academia, finding one position is challenging enough; finding two positions in the same institute or city is especially difficult. PIs can work with graduate student and postdoc candidates to help their partners find positions by contacting other PIs at the same (or nearby) institute(s) on behalf of the partner. Even if there are no available positions at the time, the established network would be invaluable and could lead to future opportunities.

Annually discuss how to handle unacceptable behavior and harassment within your lab group. Microaggression and harassment, including sexual harassment, may contribute to women leaving academia[7]. Some students, postdocs, and faculty members may never have received any training on how to handle harassment. PIs can be proactive in preventing these issues by having a yearly discussion within their groups of what harassment entails and the procedures for reporting it to the institution's Human Resources department. This may also prevent instances where cultural differences lead to misunderstandings. As the leader of a lab group, the PI should let all members of the lab, female or male, know they are respected and supported.

Ask for opinions from lab members and colleagues, especially females, when hiring. A PI is usually the sole decision maker when it comes to accepting graduate students and hiring postdocs into the lab. Unfortunately, PIs may unconsciously discriminate against female applicants by underestimating their qualifications[8]. To avoid unconscious gender biases, PIs can be proactive by asking their current lab members and colleagues to review and provide feedback on potential graduate student and postdoc applications. Implicit Bias tests available online (for example, https://implicit.harvard.edu/implicit/ or http://www.understandingprejudice.org/iat/) can also be helpful in recognizing gender bias.

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journals in the news

"DOMESTICATED ANIMALS' JUVENILE APPEARANCE TIED TO EMBRYONIC CELLS"

—*Science News*, July 14, 2014

Why do domesticated animals share characteristics like floppy ears, white patches, and smaller snouts? In a *GENETICS* Perspectives article, Wilkins *et al.* propose a hypothesis that links many aspects of "domestication syndrome" with mild defects in neural crest cells.

Their hypothesis, and many adorable photos of puppies, were widely covered by the popular press and discussed on blogs and social media, including articles at Science News, Slate, *The Daily Mail, Mashable, Pacific Standard, The Economist, Psychology Today, AAAS Science Reports, Guokr, The Conversation, LiveScience, Australalsian Science, Io9, IFLS,* and the *Sydney Morning Herald*.

The "Domestication Syndrome" in Mammals: A Unified Explanation Based on Neural Crest Cell Behavior and Genetics. Adam S. Wilkins, Richard W. Wrangham, and W. Tecumseh Fitch. ***GENETICS*** July 2014 197:795-808

GSA JOURNALS SOCIAL MEDIA BUZZ

WOULD FRED SANGER GET FUNDED TODAY?

Yes, Fred Sanger would probably succeed even in today's sluggish funding climate, argued Stan Fields in a *GENETICS* Perspectives article in June. His take attracted a lot of attention on social media and blogs. "I don't think we've seen the last of game-changing ideas from individual scientists," Fields told *Nature* magazine's "Social Selections" blog.

Would Fred Sanger Get Funded Today? Stanley Fields. ***GENETICS*** June 2014, 197:435-439

NIH Institutes explore new models for funding research

Yvette Seger,
FASEB Office of Public Affairs

This summer, the National Institute of General Medical Sciences (NIGMS) and the National Cancer Institute (NCI) signaled a willingness to explore new models for funding biological and medical research activities that would place emphasis on the contributions of the Principal Investigator (PI) rather than a specific line of research. The strategy of funding "people" versus "projects" is not new; the Howard Hughes Medical Institute employs this format for funding research and the National Institutes of Health's (NIH's) Director's Pioneer Awards were implemented "to complement NIH's traditional, investigator-initiated grant programs by supporting individual scientists of exceptional creativity who propose pioneering and possibly transforming approaches to addressing major biomedical or behavioral challenges." What is new is the possibility that individual NIH Institutes and Centers may opt to fund more research using this strategy rather than traditional Research Project Grants (RPGs; *e.g.*, R01).

The NCI was first out the gate with the announcement of its Outstanding Investigator Award (R35) program in June. The R35 program would support a PI for seven years and provide up to $600,000 annually with the requirement that institutions commit at least 20 percent to PI salary support. The application process for the NCI program, which involves an institutional nomination to identify eligible PIs, also incorporates the new biosketch format that was announced by NIH in May of this year.

In July, the NIGMS released a Request for Information (RFI) seeking public input on the proposed Maximizing Investigators' Research Award (MIRA) which would provide a PI with a range of $150,000 to $750,000 annually for five years, be renewable, and offer up to $150,000 per grant cycle to support the purchase of new equipment. In return, the PI must commit 50 percent effort to the proposed research program and relinquish most other sources of NIGMS research funding upon acceptance of an NIGMS MIRA. Input from this RFI was used to inform a concept clearance for a program pilot that was adopted during the September meeting of the NIGMS Advisory Council.

MEMBER PROFILE

GEN LIN

PhD student, European Molecular Biology Laboratory
Born: Singapore

"Budding yeast mate and reshuffle their genomes through a process called recombination; I am trying to understand how this works and what it means."

Why do you think societies like GSA are important?
Genetics is this vast exciting field that spans many different organisms and disciplines. I see GSA as this big umbrella that brings people together and makes you aware of what's happening in other research fields trying to elucidate similar genetic principles.

Who is your scientific hero and why?
R.A. Fisher. You might see him as the villain for the p-value, but I also feel he's the first person to conceptualize how to approach biological variations which became the foundations of quantitative genetics.

What's the coolest place you've traveled?
Sweden. Cycling in winter, I always wondered what it means existentially when the relentless snow erases my bicycle tracks.

And the winners are...

Fall 2014 DeLill Nasser Award Winners

The DeLill Nasser Award was established by GSA in 2001 to honor its namesake, DeLill Nasser (1929–2000), a long-time GSA member who provided critical support to many early-career researchers during her 22 years as program director in eukaryotic genetics at the National Science Foundation. Applications are open to graduate student and postdoc members of GSA. The award provides a $1,000 travel grant for each recipient to attend any national or international meeting, conference, or laboratory course.

Postdoctoral winners

Meleah A. Hickman, PhD, University of Minnesota
Travel to: 2014 GSA Yeast Genetics Meeting
Principal Investigator: Judith Berman

Michelle D. Leach, PhD, University of Toronto, Canada
Travel to: 2014 GSA Yeast Genetics Meeting
Principal Investigator: Leah Cowen

Daniel A. Pollard, PhD, University of California, San Diego
Travel to: 2014 GSA Yeast Genetics Meeting
Principal Investigator: Scott Rifkin

Huanyu Qiao, PhD, University of California, Davis
Travel to: GSA 27th Annual Mouse Molecular Genetics Conference
Principal Investigator: Neil Hunter

Tiffany A. Timbers, PhD, Simon Fraser University, Canada
Travel to: 19th Summer Institute in Statistical Genetics: Network and Pathway Analysis of Omics Data course
Principal Investigator: Michel R. Leroux

Graduate student winners

Alina Chan, University of British Columbia
Travel to: 2014 GSA Yeast Genetics Meeting
Principal Investigator: Philip Hieter

Amanda L. Socha, Dartmouth College
Travel to: 25th International Conference on Arabidopsis Research
Principal Investigator: Mary Lou Guerinot

Emily Fawcett, University of Washington
Travel to: Aging, Metabolism, Stress, Pathogenesis and Small RNAs in *C. elegans* conference
Principal Investigator: Dana Miller

Jason V. Rogers, Princeton University
Travel to: 2014 GSA Yeast Genetics Meeting
Principal Investigator: Mark Rose

Summer/Fall 2014 Undergraduate Travel Award Winners

These awards promote excellence in undergraduate research and education by providing financial assistance for undergraduate members to present their research at a GSA conference. The winners of the GSA Undergraduate Travel Awards for summer/fall 2014 are:

Ann Aindow, University of California, Berkeley
Travel to: 2014 GSA Yeast Genetics Meeting
Mentor: Jeremy Thorner

Sarah Cossey, Kansas State University
Travel to: GSA 16th International Conference on the Cell and Molecular Biology of Chlamydomonas
Mentor: Bradley Olson

Nicole Delos Santos, University of Nevada, Las Vegas
Travel to: GSA 15th International Xenopus Conference
Mentor: Kelly Ai-Sun Tseng

Pui Shan Hung, University of Toronto, Canada
Travel to: 2014 GSA Yeast Genetics Meeting
Mentors: Tina Sing; Grant Brown

Spencer Keil, University of Miami
Travel to: GSA 11th International Conference on Zebrafish Development and Genetics
Mentor: Isaac Skromne

Alex Murphy, Gonzaga University
Travel to: 2014 GSA Yeast Genetics Meeting
Mentor: Kirk Anders

Benjamin Walker, Roanoke College
Travel to: GSA 11th International Conference on Zebrafish Development and Genetics
Mentor: Christopher Lassiter

Mun Hong Yong, University of Wisconsin–Madison
Travel to: 2014 GSA Yeast Genetics Meeting
Mentor: Kelly Ai-Sun Tseng

Poster Awards

2014 Drosophila Conference

Postdoctoral winners

1st: **Melanie I. Worley**, University of California, Berkeley
2nd: **Malini Natarajan**, Stowers Institute for Medical Research
3rd: **Naoki Okamoto**, RIKEN, Center for Developmental Biology (CDB), Kobe, Japan

Graduate student winners

1st: **Maureen Cetera**, University of Chicago
2nd: **Gavin R. Rice**, University of California, Davis
3rd: **Sarah Neuman**, University of Wisconsin–Madison

Undergraduate winners

1st: **Kurtresha Worden**, University of Nevada, Reno
2nd: **Dallas Criscoe**, North Carolina State University
3rd: **Robert J. Yamulla**, Franklin and Marshall College

2014 Yeast Genetics Meeting

Left to right: **Joseph Sanchez** (PhD student, University of Washington; 1st prize), **Mark Rutledge** (PhD student, Princeton University; 3rd prize), **Erica Hildebrand** (PhD student, Fred Hutchinson Cancer Research Center; 4th prize), and **Jinglin Lucy Xie** (PhD student, University of Toronto; 2nd prize). Honorable mentions went to **Ann Aindow** (Undergraduate, University of California, Berkeley), **Alina Chan** (PhD student, University of British Columbia), and **Pui Shan Hung** (Undergraduate, University of Toronto).

2014 Xenopus Conference

Nicholas Davenport, University of Wisconsin–Madison
Katherine Pfister, University of Virginia
Erin Turk, Stanford University
Romain Gibeaux, University of California, Berkeley

2014 Mouse Molecular Genetics Conference

Graduate student winner: Kevin Ross, University of California, San Diego
Postdoc winner: Nestor Saiz Arenales, Sloan Kettering Institute

Thank You GSA Donors!

The Genetics Society of America is grateful to our 109 donors who have contributed $8,587 from January 2014 through September 2014 to the Society and/or its special funds. Your charitable donations enable GSA to support educational programs, advocacy, and media and public outreach that promote our field and the next generation of geneticists.

Your donations can also be directed to support specific GSA programs, such as GSA Undergraduate Travel Awards, DeLill Nasser Awards for Professional Development in Genetics, and poster awards at GSA conferences.

We invite every member to make a contribution to GSA to ensure the future of our discipline. From $1 to $10,000, every donation is greatly appreciated for its impact on the next generation of researchers and the genetics community at large. To donate by credit card, please visit genetics-gsa.org/donate. You can also add a donation when you join or renew your Society membership: genetics-gsa.org/membership. Checks should be made out to the Genetics Society of America, with the specific fund indicated in the "memo" line: GSA General Fund, DeLill Nasser Fund, Victoria Finnerty, Undergraduate Travel, or Chi-Bin Chien Award. Mail your check to GSA, 9650 Rockville Pike, Bethesda, MD 20814-3991, Attn: Adam Fagen, Executive Director.

Contributions are tax-deductible to the extent permitted by law. GSA is a nonprofit charitable organization under 501(c)3 of the Internal Revenue Service Code.

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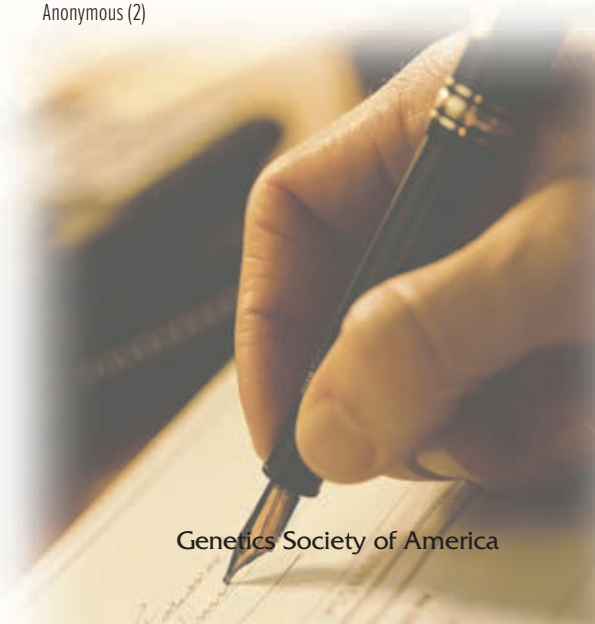

2014 GSA Conference Highlights

1 Andi Pauli delivers the Chi-Bin Chien Award lecture at #ZFISH2014

2 *Drosophila* biologist-turned-filmmaker Alexis Gambis gives #DROS2014 an exclusive preview of his new feature film *The Fly Room*

3 GSA Novitski Prize recipient Charlie Boone at #YEAST14

4 #ZFISH2014 poster session

5 #DROS2014 keynote speaker Bruce Alberts

6 Hugo Bellen receives GSA's George W. Beadle Award from GSA Board member Lynn Cooley

7 Ruei-Jiun Hung receives the Larry Sandler Award at #DROS2014

8 Mentored Genetics Conference Experience at #ZFISH2014

9 Anita Hopper with Stan Fields after her #YEAST14 Winge-Lindegren Address

10 NIGMS Director Jon Lorsch at #YEAST14

11 #DROS2014 conference participants refuel at a coffee break

12 Party time at #ZFISH2014

13 #YEAST14 organizers Trisha Davis and Mike Snyder with George Church at his Lee Hartwell Award lecture

14 Olga Troyanskaya delivers the #YEAST14 Ira Herskowitz Award lecture

15 #YEAST14 Lifetime Achievement Awardee Jeremy Thorner

16 Graham Lieschke entertains #ZFISH2014 participants at the organ with some Bach

For more conference photos, please see: http://tinyurl.com/dros2014, http://tinyurl.com/zfish2014, and http://tinyurl.com/yeast14

president's letter

continued from page three

evolution of our field; meet the new editors on page 6 of the newsletter. *GENETICS* and *G3* are making it as easy as possible for you to publish: the editorial boards strive to give you an answer on your manuscript as soon as possible and accepted articles are published quickly; we will review manuscripts that are formatted for either our journals or for other journals; and we will promptly respond to presubmission inquiries so you can know whether your article fits within the journal scope. And we have greatly expanded our efforts to spread the word about your research published in GSA's journals; just a small sample of some recent coverage of *G3* and *GENETICS* articles is detailed on p. 16 and 17.

I am very excited about a very special meeting GSA will be hosting in 2016. The Allied Genetics Conference (TAGC) will co-locate individual meetings of the *C. elegans*, ciliate, *Drosophila*, mouse, yeast, and zebrafish communities and a new focal area in population, evolutionary, and quantitative genetics in Orlando, Florida. TAGC will build on the strength of these constituent meetings to provide an experience that is greater than the sum of its parts. Attendees will not only benefit from the top science and sense of community within the individual conferences, but have the opportunity to network with colleagues and hear about cutting-edge research from across our field. In addition to the individual meetings, there will be three exciting plenary sessions with a terrific slate of speakers, which are listed on p. 8. Make sure that you have saved July 13–17, 2016, on your calendar, and we look forward to seeing you at TAGC.

Finally, I want to thank each of you for all you do to contribute to education and research, which makes our community so strong.

— Vicki Chandler

Honors to GSA Members

Vicki Chandler

Congratulations are due to **GSA President Vicki Chandler** (Gordon and Betty Moore Foundation), who was appointed by President Obama as a member of the National Science Board (NSB). The NSB is the policymaking body for the National Science Foundation (NSF) and serves two essential functions for the nation: (1) setting NSF policy, identifying issues that are critical to NSF's future, approving NSF's strategic budget directions and the annual budget submission to the Office of Management and Budget, and approving new major programs and awards; and (2) serving as an independent body of advisors to both the President and Congress on policy matters related to science and engineering and education in science and engineering.

GSA also congratulates members **Victor Ambros** (University of Massachusetts Medical School) right, and **Gary Ruvkun** (Massachusetts General Hospital and Harvard Medical School) left, who share the 2014 Gruber Genetics Prize in recognition of their pioneering discoveries of the existence and function of microRNAs and small interfering RNAs. Ambros, Ruvkun, and plant biologist David Baulcombe received a $500,000 cash prize and were honored at the American Society of Human Genetics 2014 Annual Meeting.

MEMBER PROFILE

KATHRYN ANDERSON

Chair, Developmental Biology Program, Sloan Kettering Institute
Born: La Jolla, CA, USA
GSA member since: 1997

"I investigate genes that control patterning and morphogenesis of the early mouse embryo."

Why are you a member of GSA?
Although we study development using a variety of approaches, I think of myself first as a geneticist.

Who is your scientific hero and why?
Rosa Beddington was my hero because of her amazing insight into the mouse embryo combined with a high energy and witty personality.

What's something that most people don't know about you?
My rock-n-roll youth.

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GSA 2014-2015 Calendar November – March

NOVEMBER 2014	
NOV 10	Abstract Submission Deadline, 56th Annual Drosophila Research Conference
NOV 12-15	Annual Biomedical Research Conference for Minority Students, San Antonio, TX
NOV 13	Early Meeting and Housing Registration Deadline, 6th Strategic Conference of Zebrafish Investigators
NOV 15	Deadline for entry into prize draw by renewing or starting GSA Membership
NOV 30	Deadline for GSA Journals Cover Art Contest submissions

DECEMBER 2014	
DEC 1	Larry Sandler Award Submission Deadline, 56th Annual Drosophila Research Conference
DEC 10	Abstract Submission, Registration, Housing Deadline, 28th Fungal Genetics Conference
DEC 10	Abstract Revision Deadline, 28th Fungal Genetics Conference
DEC 15	Platform/Poster Assignments Online, 6th Strategic Conference of Zebrafish Investigators
JANUARY 2015	
JAN 16	Early (Discounted) Conference Registration Deadline, 56th Annual Drosophila Research Conference
JAN 17-21	6th Strategic Conference of Zebrafish Investigators, Pacific Grove, CA

FEBRUARY 2015	
Applications open for Undergraduate Travel, DeLill Nasser Awards	
FEB 6	Deadline for Hotel Reservations, 56th Annual Drosophila Research Conference
FEB 13	Abstract Submission Opens, 20th International *C. elegans* Conference
FEB 17	Platform/Poster Assignments Online, 28th Fungal Genetics Conference
FEB 18	Registration Opens, 20th International *C. elegans* Conference
MARCH 2015	
MAR 4-8	56th Annual Drosophila Research Conference, Chicago, IL
MAR 17-22	28th Fungal Genetics Conference, Pacific Grove, CA

www.genetics-gsa.org