Genetics Society of America

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From the President's desk:

As geneticists we live in interesting times. Genetics has recently undergone its most rapid advances since Mendel published his paper in the Proceedings of the Brünn Society for the Study of the Natural Sciences. Genetic analyses using model organisms can now be applied to virtually every area of biological and medical science. Why, then, is the enthusiasm and pleasure that GSA members enjoy when contemplating the future of our field currently tempered with concern and even alarm?

Unlike Mendel's discoveries, which were ignored for 34 years, the current problems with funding levels and career prospects stem from the field's great success and subsequent public visibility. Science's most exciting current subject has attracted a large and diverse group of new practitioners, and become increasingly expensive. Many different opinions are heard about the future of genetic research. As in Mendel's day, some advocate the intellectual equivalent of switching from pea to hawkweed. Diverse new projects, directions and applications are regularly touted, most with some measure of validity, but too often with great scientific naivety. Finally, genetic research is increasingly perceived as a subject with political, economic and even religious implications.

The primary purpose of the Genetics Society of America is to articulate the views of its membership, which collectively harbors the greatest wisdom available regarding the future of genetics research. The GSA should strive to be the most credible source regarding the current status and future potential of genetic science. It should provide policymakers with information relevant to research priorities in genetics that is based on scientific value, rather than the financial needs of large institutions, corporations and projects. One message is very clear: The utility of forward genetic analysis in model organisms is not drawing to a close, but coming into its prime. Querying genomes in ways that are independent of pre-conceived notions remains essential in order to address the immense complexity of multicellular life. In addition, the opportunity now exists for model organism genetics to interact more closely with human genetics. The profound contributions of basic research to medicine that we have seen in the past have the potential over the coming years to increase still further.

The GSA is currently undertaking several new steps to strengthen our mission. First, we are evaluating whether our relationship with the Joint Steering Committee for Public Policy (JSC) needs to be supplemented, or replaced, by new mechanisms that more effectively promote the Society's goals. Before the June Board meeting, the President and the Board members would like

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Dear Abbot:

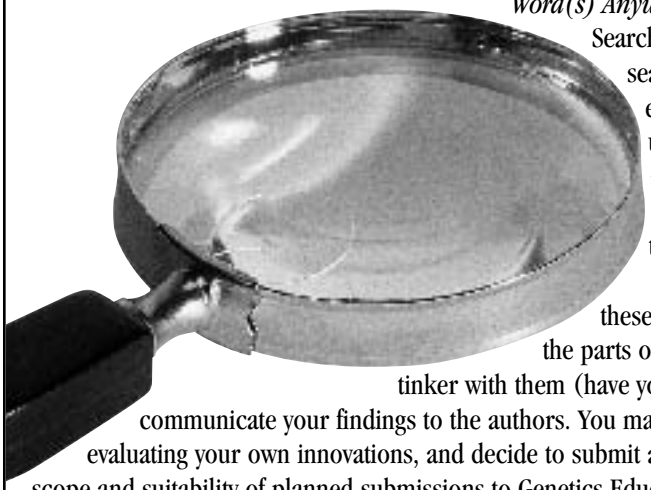
It seems as if my teaching is a solitary endeavor. I plan my lectures, teach them, and hope my students are learning. When I develop innovations that help my students learn, I always have the suspicion that someone somewhere had this idea long before I did. Where can I go to find and share ideas about how to teach genetics more effectively and in a more scholarly way?

– Alone in North Carolina

Dear Alone,

Are you looking for some good ideas for effective teaching and outreach? Your very own journal, *GENETICS*, is a great place to start! You may have noticed occasional articles in the "Genetics Education" section, which Patricia Pukkila established in 1997. This section represents the evolution of Lee Hartwell's pioneering "Genetics in the Classroom" section that was introduced several years earlier. To date, the journal has published 15 education articles, with one more on the way. The easiest way to find these articles is to go to the GSA homepage (http://www.genetics-gsa.org/), click on the "spore" labeled "Teaching of Genetics" and select "Genetics Education Articles". You will be directed to a page maintained by GenEdNet that has links to all the articles.

Alternatively, you can visit the Journal website (http://www.genetics.org/), select *Search for Articles*, type "genetics education" in the *Word(s) Anywhere in Article* box (be sure to include the quotation marks), and the Search Results page will display all 15 articles with links to the full text. Such a search reveals that the articles cover a wide range of topics including ethics, evolution, alternatives to lecturing, and ways to help students connect their understanding of genetics to issues of interest to them. The goal is for the articles or notes to be sufficiently detailed to permit others to adapt the ideas to their own circumstances, and also to provide evidence concerning the value of the innovations.



How might you use these articles? The authors hope that you will view these contributions as you would view any other papers in the Journal, and try the parts of these "education protocols" that are relevant to your circumstances, tinker with them (have you ever used a research protocol without making ANY changes?) and communicate your findings to the authors. You may also find that one or more articles provide you with a framework for evaluating your own innovations, and decide to submit an article of your own. The Journal welcomes all inquiries concerning the scope and suitability of planned submissions to Genetics Education or Genetics Education Notes (Contact: pukkila@unc.edu).

Authors of genetics education articles have reported that the peer review process was very beneficial and often led to some important insights. They appreciated the opportunity to publish in a journal that is read by scientists who may not take the time to read journals devoted to education. They also enjoyed the opportunity to have their articles cited in a wide range of venues, as well as the resulting numerous conversations and e-mail exchanges with colleagues previously known and unknown.

In a 1999 book review[1], Alison Gopnik invited *GENETICS* readers to "imagine if we taught baseball the way we teach science." She concluded that children would be quizzed on the rules of baseball, read about the techniques of baseball, and hear stories about great baseball players. They would then practice fundamental skills, and undergraduates might even be allowed to reproduce famous baseball plays from the past. Finally, in graduate school, they would get to play a game.

Instead, our colleagues have concluded that the skills and values of research science, especially conceptualization, analysis, investigation and collaboration are directly applicable to classroom science education. They have developed some exciting ways for students to utilize these skills and values and engage in the complexities of modern genetics. I invite you to build on their ideas, so that our students experience inquiry and discovery, and develop the habits of mind that are necessary to address future unsolved problems with confidence.

Patricia J. Pukkila
University of North Carolina at Chapel Hill

Reference: 1. Gopnik, Alison 1999 Small Wonders. The New York Review of Books, May 6.

Applications Being Accepted for Rosalind Franklin Award

If you are female, are within the first one to three years of an independent faculty-level position in any area of genetics, anywhere in the world, you are eligible to apply for the Rosalind Franklin Young Investigator Award, funded by the Peter and Patricia Gruber Foundation. This $75,000 award, administered over three years ($25,000 per year), is named to honor Dr. Rosalind Franklin and her ground-breaking contributions to the discovery and understanding of the structure of DNA.

In 2004, Amy E. Pasquinelli, University of California, San Diego, (see article below) was the first recipient of the Rosalind Franklin Young Investigator Award, which is presented every three years. The recipient will be chosen by a joint committee appointed by the GSA, the American Society of Human Genetics (ASHG) and the Peter and Patricia Gruber Foundation. This career development research award may be used for any purpose that advances genetics research being done by the recipient except for salary support of the recipient herself.

The deadline for the 2007 application is June 1, 2007. Applications must be submitted online at http://www.ashg.org/genetics/ashg-gsa/franklin/2007/. In addition to the application, two letters of recommendation in support of the applicant must be submitted to the ASHG/GSA administrative offices no later than June 8, 2007. For additional information, see the website listed above.

Franklin Award Supports Bench Science for First Recipient

by Amy E. Pasquinelli, University of California, San Diego

One of the most daunting tasks facing a new assistant professor is securing funding. Many of us move from rather comfortable post doctoral appointments to independent positions where the joy and excitement of building an independent research program can be quickly squelched by practical considerations of money. The dread of grant writing by novices is heightened by the current limitations in federal funding. Thus, funding for basic research by private groups, such as the Peter Gruber Foundation, is appreciated now more than ever.

I feel most fortunate to have been chosen by the GSA for the inaugural Rosalind Franklin Young Investigator Award established by the Peter Gruber Foundation in 2004. In addition to the very welcomed financial support provided by this award, the prestige that accompanies this honor has been both reassuring and motivating.

I was a post doc in Gary Ruvkun's lab at Harvard Medical School when we first demonstrated the existence of miRNAs in diverse animal species. The excitement of that discovery has not diminished, and my lab at UCSD continues to study the role of specific miRNAs in development. Already mis-regulation of miRNA pathways has been implicated in human disease. Thus, a broad goal of our research is to uncover basic principles of miRNA expression and function, which we hope will contribute toward a better understanding of altered miRNA function and how to remedy it.

Financial support from the Gruber Foundation and other private funds has allowed me to spend more time pipetting and less time applying for grants. A reprieve from perpetual grant writing has also enabled me to accept more speaking opportunities at meetings and universities. Every opportunity to communicate my research has resulted in new ideas and questions, stimulated by audience members, which positively contribute to the direction of my research and that of others.

The prevalent under-representation of women in science, most notably in advanced career positions, was a primary reason for the establishment of the Rosalind Franklin Award by the Gruber family. The recognition of a woman geneticist early in her career promotes not only her future aspirations, but also contributes to the long-term goal of gender-blind opportunities and advancements in science. The current breathtaking pace of research advancements and development of novel tools necessitates the collaboration of diverse talents and knowledge to push the frontiers of science. Like many of the women and men following this path, I have to thank private groups, like the Gruber Foundation, for recognizing the importance of basic research, and providing opportunities that ultimately accelerate discovery.

New GSA Award Announced: The Novitski Prize

The GSA is pleased to announce a new award, The Novitski Prize, named in honor of Drosophila geneticist Edward Novitski (1918-2006), and designed to recognize "an extraordinary level of creativity and intellectual ingenuity" in solving significant problems in genetics research. The award will recognize scientific achievement that stands out from the body of creative work, that is deeply impressive to creative masters in the field, and that solves a difficult problem that may have evaded the genetics scientific community. The prize, established by the Novitski family, will include an engraved medal that will be presented at an annual genetics research meeting where the recipient will be invited to present a talk on the research being recognized.

Longtime GSA member, Edward Novitski.

Edward Novitski was a student of Alfred Sturtevant, himself a student of Thomas Hunt Morgan. He specialized in chromosome mechanics, elucidating meiosis through the construction of modified chromosomes. He was educated at Purdue University and Caltech and had been a faculty member at the University of Missouri, The Oak Ridge National Laboratory and the University of Oregon. He mentored Larry Sandler and Dan Lindsley among other Drosophila geneticists. Novitski himself tackled difficult biological problems using innovative experimental approaches.

The recipient of the award will be selected by a committee of GSA members. All GSA members are invited to nominate someone for this award. Work from any period is eligible, but the recipient must be alive at the time the award is decided. The nominee can be from anywhere in the world and does not need to be a GSA member. Nominations for this award can be submitted through the GSA website (http://www.genetics-gsa.org/), which will be open soon.

Geneticists and Students Receive GSA Awards

Beadle Medal: Robert K. Herman

GSA Medal: Shirley M. Tilghman

Morgan Medal: Oliver Smithies

GSA Excellence in Education: Elizabeth W. Jones

The 2007 GSA award recipients have been announced. Robert K. Herman, University of Minnesota, received the George W. Beadle Medal for his outstanding contributions to the community of genetic researchers; Shirley M. Tilghman, Princeton University, is the recipient of the GSA Medal in recognition of her contributions to the field of genetics for the past 15 years; Oliver Smithies received the Thomas Hunt Morgan Medal for his lifetime contributions to the field of genetics; and Elizabeth W. Jones, Carnegie Mellon University, is awarded the first GSA Award for Excellence in Education in recognition of her significant and sustained impact on genetics education (See pages 8 & 9 for a profile on Elizabeth W. Jones).

William W. Ja

Chad G. Pearson

In addition, two graduate students and two postdoctoral researchers have received the DeLill Nasser Awards for Professional Development in Genetics. Recipients of this award receive travel grants to scientific meetings that will help them pursue their careers. Graduate student Ya-Chieh Hsu, Baylor College of Medicine and postdoctoral researcher William W. Ja, California Institute of Technology, used their awards to attend the GSA sponsored 48th Annual Drosophila Research Conference, March 7-11, 2007 in Philadelphia (See article on pages 6 & 7). Graduate student Kristin R. Armstrong, The Ohio State University will attend

Ya-Chieh Hsu

Kristin R. Armstrong

DeLill Nasser Awardees

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GENETIC ANALYSIS: Model Organisms to Human Biology 2

Genetics Society of America

GSA MEETING
January 5-8, 2008
San Diego, California

Prokaryotes and Pathogens: SPEAKERS
Chair: **Carol Gross** — **Carol Gross, Joe DeRisi, Claire Fraser, Stan Leibler**

Chromosomes: SPEAKERS
Chair: **Terry Orr-Weaver** — **Terry Orr-Weaver, Johannes Walter, Tom Petes, Pat Hunt**

Chromatin: SPEAKERS
Chair: **Barbara Meyer** — **Barbara Meyer, Rudolf Jaenisch, David Allis, Steve Jacobsen**

RNA-Mediated Regulation: SPEAKERS
Chair: **Greg Hannon** — **Greg Hannon, Rob Martienssen, Meng Chao Yao, David Bartel**

Technology: SPEAKERS
Chair: **Allan Bradley** — **Allan Bradley, Hugo Bellen, Michele Calos, Paul Sternberg**

Neurobiology and Behavior: SPEAKERS
Chair: **Cori Bargmann** — **Cori Bargmann, Karl Deisseroth, Gene Robinson, Sara Tischkoff**

Populations: SPEAKERS
Chair: **Trudy MacKay** — **Trudy MacKay, Steve Scherer, Daniel Barbash, Ulrike Heberlein**

Aging: SPEAKERS
Chair: **Dan Gottschling** — **Dan Gottschling, Andy Dillin, Leonard Guarente, Daniel Promislow**

Bioengineering: SPEAKERS
Chair: **Chris Sommerville** — **Chris Sommerville, Claudia Schmidt-Dannert, Mary Lou Guerinot**

Keynote Speakers: Andy Fire, Richard Axel, Francis Collins

- **Abstract Submission Deadline: November 14**
- **Registration Deadline: December 3**

Two poster sessions PLUS additional speakers chosen from abstract submissions!

www.GSA-MODELORGANISMS.org

2007 DrosoPHILAdelphia

Philadelphia, a city whose name includes the last part of Drosophila in it, welcomed over 1500 fly researchers and students for the 48th Annual Drosophila Research Conference on March 7-11. The four-day meeting was kicked off Wednesday evening with an historical address by Spyros Artavanis-Tsakonas, Harvard Medical School/MGH Cancer Center, Boston, MA. Artavanis-Tsakonas discussed, in both a

1. Bill Gelbart of FlyBase, Urs Schmidt-Ott, and Thom Kaufman taking time to chat together. 2. Phil Batterham speaking informally with Chuck Langley 3. Lynn Marquis, of the JSC, discussing federal policy with (from l to r) John Cumbers, Leslie Puck, Trudi Schüpbach, Tim Christensen, and Mark Garfinkel. 4. GSA President Allan Spradling offering one-on-one advice to Jianjou Sun. 5. Ken Burtis and students at the Mentor Roundtable. 6. Board member Trudy Mackay, left, talking with student participants.
Photos by Elaine Strass

thoughtful and humorous manner, the investigations of the Notch receptor from the 1940s to the present day. His address was followed by the presentation of the Larry Sandler Memorial Award given to Yu-Chiun Wang, University of Chicago, and by his lecture on extracellular transport sharpens the Dpp gradient in the embryo.

The following days were packed with two plenary sessions; seven concurrent platform sessions, featuring 140 presentations; eight concurrent workshops; and four poster sessions where nearly 850 posters were on view. These sessions featured both depth and breadth across all fields and disciplines. Plenary speakers discussed the neural networks underlying taste, sleep and color vision; mechanisms of cell migration, intracellular transport and cell shape change; control of gene expression at the levels of transcription and splicing; and the evolution of gene regulation and speciation. RNA was emphasized in two workshops covering both its regulation in vivo and the use of RNA interference to study gene functions. And the platform and poster sessions covered a wide range of topics, from genome structure to social behavior.

As if all this wasn't enough, FlyMine and FlyBase databases both had drop-in demonstrations, a dozen exhibitors displayed their products and services, students were again given the opportunity to talk with mentors at the GSA Mentor Roundtable, and researchers concerned with NIH funding and other proposals before the federal government met with Lynn Marquis of the Joint Steering Committee on Public Policy.

Wrapping up the meeting on Sunday was a plenary session that included the presentation of the GSA Poster Awards, three to students and three to postdocs. Student awardees were: First prize of $500 to Andres Dekanty, Fundación Instituto Leloir, Buenos Aires, Argentina; second prize of $300 to Lei Bai, Yale University, New Haven, CT; and third prize of $200 to Abbie Casper, Johns Hopkins University, Baltimore, MD. The postdoc awardees were: First prize, $500, to Attilio Pane, Princeton University, NJ; second prize, $300, to Manos Mavrakis, NICHD, NIH, Bethesda, MD; and third prize, $200, to Nir Yakoby, Princeton University, NJ.

The meeting was ably organized by Steve DiNardo, University of Pennsylvania School of Medicine, Liz Gavis, Princeton University, Tom Jongens, University of Pennsylvania School of Medicine and Jessica Treisman, New York University Medical Center. Our thanks to them for all their hard work and a great meeting. Suzy Brown of GSA provided essential logistical support and ensured the meeting's success.

Preparations are already underway for next year's meeting in San Diego, California, so **mark your calendar now for April 2-6, 2008!**

GSA Drosophila Poster Award winners at their posters.
Student Awardees, top row, left to right: Andres DeKanty, Fundación Instituto Leloir, Buenos Aires, Argentina; Lei Bai, Yale University; Abbie Casper, Johns Hopkins University
Postdoc Awardees, bottom row, left to right: Attilio Pane, Princeton University. Manos Mavrakis, NICHD, NIH; Nir Yakoby, Princeton University.

GSA Web Page Changes in the Works

by Jeff Sekelsky, University of North Carolina at Chapel Hill

Watch for the new GSA website! The website will be undergoing a transformation in the next several months. To give it a cleaner look and make it more user friendly, the Board of Senior Editors, chaired by Suzanne Sandmeyer, University of California, Irvine, is working with the GSA Board and administrative staff in developing a new look for the GSA website. In addition, GSA member Jeff Sekelsky, University of North Carolina at Chapel Hill, is the new GSA Website Scientific Content Adviser.

Sekelsky's plans for the website include adding additional resources for students and postdoctoral fellows and regular updates on news of interest to GSA members. Please send suggestions for information that should be included on the GSA website, to Sekelsky at sekelsky@unc.edu.

Sekelsky first began creating websites while doing postdoctoral research in Scott Hawley's lab at the University of California, Davis, where he learned HTML and wrote a lab website. Now at UNC, Sekelsky designed and maintains a website for his own lab (http://sekelsky.bio.unc.edu/). In his role as chair of the website committee for the Department of Biology at UNC, he is currently involved in designing and implementing a new departmental site.

Sekelsky has been a member of GSA since 1995, when he was a graduate student in Bill Gelbart's lab at Harvard University. After completing his Ph.D. studies on Drosophila *Mad*, he moved to Davis, California to do postdoctoral research with Hawley, studying mechanisms of meiotic recombination in Drosophila. In 1999 he accepted a position in the Department of Biology and the Program in Molecular Biology and Biotechnology at the University of North Carolina at Chapel Hill, where he is now an associate professor.

A Conversation with Elizabeth W. Jones

Elizabeth W. Jones, Editor-in-Chief of the *GENETICS* Journal and the Dr. Frederick A. Schwertz Distinguished Professor of Life Sciences and Head of the Biological Sciences Department at Carnegie Mellon University, received GSA's first Excellence in Education award in 2006. Dr Jones has been teaching since 1970, and by her own account has probably taught thousands of students. In 2002 she received a $1 million Howard Hughes Medical Institute Professor Award, which is being used for the development of software for teaching genetics and a Summer Research Institute for rising sophomore students. *GENEtics* recently had the pleasure of talking with her about this work, her teaching, students, GSA and the Journal.

GENEtics:

As a child, you attended a one-room schoolhouse with the same teacher for many grades. Did she influence your decision to go into teaching?

Elizabeth W. Jones: The teacher had a profound effect on me; she was very demanding and moved along at a very fast clip. Learning was tailored to a student's ability. When we moved and I went to a regular school, I marked time for one and a half years, I was so far ahead.

I never really wanted to go into teaching; I had no aspirations to teach. In high school I wanted to become an organic chemist. In college, I was a chemistry major, but just to earn money, I worked for a geneticist cleaning lab ware. In college [*Ed. note:* in the late 1950s], when sexism was rampant, the chemistry department didn't care what women did. So I switched to zoology, but I didn't want to do taxonomy – that just wasn't my cup of tea. I switched back to chemistry, but came to the conclusion that I wouldn't be a world beater as a chemist, so I took genetics and loved it. Since there wasn't a major in genetics then, I persuaded the chemistry department to let me substitute six or seven genetics courses for chemistry courses, but I still received a BS in chemistry.

GENEtics:

Do you prefer teaching undergrads or graduate students?

Elizabeth W. Jones: I like to teach both undergraduates and graduates and have taught an intro biology course to freshmen. They're not jaded and they ask completely naïve questions. They can pinpoint something which gives me the entré to make another point.

Currently I teach genetics. Genetics is logical and you can just follow the logic of it as you lecture. For graduate students and advanced undergrads, we try to teach them to think critically, to make them skeptical and to get them to think and reason.

GENEtics:

Given the length of time you've been teaching, how do you still generate excitement over discoveries your students make?

Elizabeth W. Jones: A discovery is a discovery. If it's a pure discovery and something new, it *is* very exciting. If students know they've discovered something new, it makes science more real to them and it legitimizes them as scientists. And watching students make discoveries and develop is very exciting.

GENEtics:

Can you describe any changes that you've seen in students over the years?

Elizabeth W. Jones: Students are far less prepared to troubleshoot and problem-solve than they were in the past. My colleague and I, who teach genetics, notice that students don't know how to pull a question apart to answer it. They're not getting as much background [in science] as they used to and they're handicapped by low vocabularies; they don't read enough. Far too many students don't understand the words of a genetics problem and not just the scientific words.

They also want to be able to give the answer immediately. That isn't possible. You have to learn how to work through a problem.

I'm working with colleagues, cognitive scientists, in the Human-Computer Interaction Institute at CMU on a "cognitive tutor" – a software program – that is different from other programs in that it asks students to work through the problem. If they're solving the problem correctly, the writing is green, if incorrect, it's red. Help is available on three or four different levels with increasing specificity. The objective is to get students to understand how to get the right answer. So far there are a total of 125 problems. Each problem has on average 25 steps. [For more information on the Cognitive Tutor, see article below.] The module we're working on now is directed at undergrads, but it could be modified for medical students, high school and graduate students.

GENEtics:

Do you have any advice for students who may want to enter the field of genetics?

Elizabeth W. Jones: Learn meiosis. A large fraction of students never learn meiosis. Genetics touches on most parts of biology, serving as a launching pad for all types of science – neuroscience, organismal development, gene expression, behavior, etc. All biology and medical students should take genetics.

GENEtics:

When you invite an undergrad or a grad student to work in your lab, what particular qualities are you looking for in that student?

Elizabeth W. Jones: It is much more common for students to come and ask to work in my lab, than for me to invite them. Usually it's someone who's bright and articulate as so much of learning is dependent on language. It's someone who can think, usually with some genetic talent, although if they come to me as freshmen, the talent isn't always apparent.

Nearly every student does a semester of lab chores, washing dishes, cleaning up, etc. It teaches them where everything is and it familiarizes them with the people in the lab. They have to show incentive and if they're good, then a grad student or post doc will grab them and put them to work.

We run a Summer Research Institute at CMU for rising sophomores. Most of those selected to participate in this program find their own labs to work in. It shows they're independent and have clarified their interests.

GENEtics:

What are you doing in your lab now?

Elizabeth W. Jones: We're investigating a protein required for life of the yeast cells that is in the membrane of the endoplasmic reticulum. It is somehow required for protein folding of a subset of secretory proteins. We are carrying out alanine-scanning mutagenesis of the whole gene in hopes of recovering a conditional mutant, which has so far eluded us.

We're also developing biosensors for monitoring activities inside animal cells, using yeast cells as an expression platform for single-chain antibodies (ScFvs) on their surfaces. From a large library of single-chain antibodies we have isolated several that will bind particular dyes and through binding cause the dye to fluoresce. We can then modify the ScFvs to allow detection of a cellular activity as detected by a change in fluorescence.

GENEtics:

How important is GSA to your professional life?

Elizabeth W. Jones: GSA is really important to me. Through the years, I've published a lot in *GENETICS*. Typically the reviews were thorough and helpful. My work was always handled appropriately in review and in publication. The judgments of the

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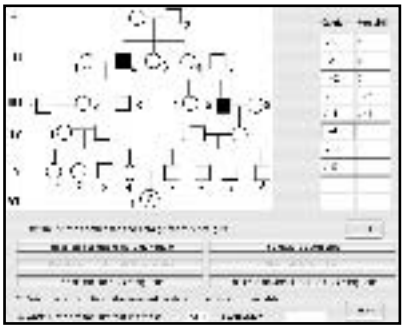
The Genetics Cognitive Tutor
An Innovative Educational Technology

by Albert Corbett and Linda Kauffman, Carnegie Mellon University, Pittsburgh

Elizabeth Jones and colleagues have partnered with cognitive scientists in CMU's Human-Computer Interaction Institute to develop an innovative Genetics Cognitive Tutor to support student problem solving. The tutor poses rich, multi-step problems for which it provides just-in-time feedback, and context-specific advice. The tutor has 16 units that span Mendelian transmission and gene interaction, pedigree analysis, gene mapping, gene regulation and population genetics. The problem-solving activities are designed to develop students' domain knowledge, quantitative reasoning skills, and scientific reasoning skills.



A Pedigree Analysis Carrier Probability Problem

To learn more about the tutor, please visit the project website: http://www.cs.cmu.edu/~genetics. While the full tutor is not yet ready for release, some piloting of individual units is ongoing at a number of colleges and universities. If you would like to be considered as a pilot site, please send email to genetics@cs.cmu.edu.

The tutor project is funded by FIPSE, HHMI, & NSF.

Filamentous Fungi at the Forefront

by Marc J. Orbach, University of Arizona, Tucson

Diversity ruled at the 24th Fungal Genetics Conference (FGC), sponsored by the GSA, held on March 20-25, 2007 at the Asilomar Conference Center in Pacific Grove, CA. At this biennial meeting, the site was filled to capacity with 750 researchers whose diversity was represented in the 31 countries and 40 US states from which they hailed. The diversity of systems was also apparent with over 180 species of fungi covering all of the fungal phyla represented in the presentations. Also prominently discussed were the unrelated, fungus-like organisms such as *Phytophthora* spp of the Oomycota.

The latest advances in fungal biology were delivered in a format that included 20 plenary talks distributed over four topic areas (Genome Structures and Dynamics, Host-Pathogen and Symbiotic Interactions, Development and Metabolism, and Sex, Time and Evolution), 200 talks in 25 concurrent sessions, over 600 poster presentations, and several special interest workshops. A hallmark of the meeting is the long-standing practice of offering graduate students and postdoctoral fellows an opportunity to present their research before an international audience.

Apparent in the presentations was that the dramatic increase in fungal genome data has led to an explosion of research in diverse areas ranging from evolution and population biology to proteomics, industrial mycology and basic fungal cell metabolism. Efforts to involve students, particularly undergraduates, in the use and analysis of genomic data and the ease of using fungi as genetic models were showcased in a session on fungi and teaching.

Susan Perkins (David Perkins' daughter) and Charles Yanofsky, keynote speaker for Memorial Service, seated at dinner.

Barbara Howlett and Joseph Heitman, chairs of the scientific program.

June Kwon-Chung of NIH, featured after-dinner speaker.

Gillian Turgeon (outgoing Fungal Genetics Policy Committee Chair) and Lorna Casselton FRS (Foreign Secretary and Vice-President, Royal Society) at the banquet.

Jakob Blaesbjerg Nielsen (left), recipient of the Dick Weiss Award for predoctoral service to the community and Marc Orbach, Fungal Genetics Policy Committee.

GSA Poster Award Winners, from left to right: Danielle Janus, Zachary Lewis, Emma Levdansky, and Manuel Sanchez Lopez-Berges.

Regina Kahmann, Cardy Raper and Louise Glass enjoying the banquet.

Photos courtesy of Matthew S. Sachs

24th Fungal Genetics Conference, continued

The meeting began with a memorial service to three major contributors to *Neurospora* research, David Perkins, Dorothy Newmeyer Perkins, and David Stadler, all of whom passed away in the last three months and left their indelible marks on the field. David Perkins had attended every previous meeting since the conference began in 1961 as the *Neurospora* Information Conference.

The meeting concluded with a banquet featuring an after dinner talk by June Kwon-Chung, of NIH. She presented her perspectives on the changing role of women in science from 1961 when she was a graduate student; on the advances of research on *Cryptococcus*; and on how the choices scientists make lead them down the career path they take.

Following the banquet, the traditional closing dance party rocked to the music of the Amplified DNA Band. Band members, scientists by day, include, Randy Berka, guitar/vocals, Aubrey Jones, keyboard, and Michael Rey, bass, of Novozymes, Glenn Nedwin, lead guitar from Dyadic, Hal Brunette, drums, of Aerojet, and John Royer, saxophone/vocals, of Microbia.

Several awards were given for outstanding posters and their recipients also reflected the international diversity of this conference. The four GSA poster award recipients were: Emma Levdansky (Israel), Zachary Lewis (US), Danielle Janus (Germany) and Manuel Sanchez Lopez-Berges (Spain). The Dick Weiss Award, honoring the long-time organizer of the FGC, for service by a graduate student to the fungal community was given to Jakob Blaesbjerg Nielsen (Denmark). ASM poster awards recipients were: Rachel Hanby (UCSF), Min Ni,(UW Madison), Soo Chan Lee (TAMU), Prasanna Knakanala (KSU), Emma Levdansky (TAU) and Zachary Lewis (UO)

The scientific program for the 24th FGC was organized by Joseph Heitman and Barbara Howlett, in collaboration with the Fungal Genetics Policy Committee (FGPC) and the Fungal Genetics Stock Center (FGSC). The FGPC includes: Gillian Turgeon (chair), Ralph Dean, Alfredo Herrera-Estrella, Jim Kronstad, Michelle Momany, John Taylor, Anne Osbourn, Barbara Valent, Kathy Borkovich, Marc Orbach and Kevin McCluskey.

The full meeting program with abstracts can be accessed via the FGSC at: http://www.fgsc.net/asil2007/asil2007.htm.

A Conversation with Elizabeth W. Jones:

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Journal reviewers are based on the quality of the science, which may not be the case in other professional journals, so I've always preferred to be published in *GENETICS*. I tell my students they should join at least one professional organization as a graduate student. They don't always select GSA to join, but GSA is an important organization because of the *GENETICS* Journal.

GENEtics:

Given your tenure as editor-in-chief of the Journal, what are you most proud of that you've done with the publication?

Elizabeth W. Jones: Foremost I'm proud of the quality of the papers that we publish. I'm proud that I've managed to keep up with change. In the last 10 years we've gone completely online for everything, from submission, review and to print. More recently, we've produced a new cover with the help of the Board of Senior Editors led by Suzanne Sandmeyer, who's doing a fantastic job. The cover is beautiful.

GENEtics:

How do you have time to do everything you do?

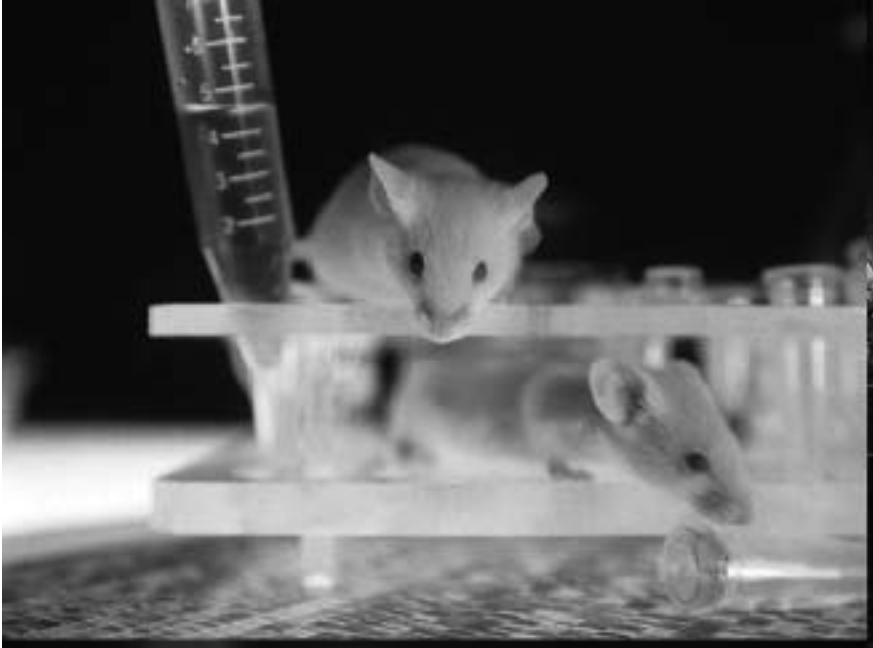
Elizabeth W. Jones: Since I'm single, I'm not answerable to anyone but myself and my cats and that's why I have time to do so much. The cats really make a huge difference in my life as they take away a lot of stress. Animals really help relieve stress. And when I can't sleep I read or do some work. I do a lot of reading.

GENEtics:

Finally, I need to set the record straight, I've read you were "one of the first" graduate Ph.D.'s from the Genetics Department at the University of Washington. Is that correct?

Elizabeth W. Jones: I was the *first* graduate Ph.D. of Genetics at the University of Washington, not just "one of them."

GENEtics welcomes suggestions for profiles of GSA members. Please send your suggestions to pedelman@genetics-gsa.org.



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From the May Issue of *GENETICS*

by R. Scott Hawley, Stowers Institute of Medical Research, Kansas City, MO and Andrew G. Clark, Cornell University, Ithaca, NY

Don't miss the full text of these articles in the May 2007 issue of GENETICS at http://www.genetics.org/current.shtml.

Neurospora Spore killers Sk-2 and Sk-3 suppress Meiotic Silencing by Unpaired DNA

Authors: Namboori B. Raju, Robert L. Metzenberg, and Patrick K. T. Shiu

This research provides a fascinating link between the seemingly unrelated phenomena of meiotic drive and meiotic silencing. In Neurospora, the diploid zygote monitors the pairing of DNA segments during meiotic prophase I. Any gene found not paired with a homolog, as well as sequences homologous to it, will be silenced by the Meiotic Silencing by Unpaired DNA (MSUD) mechanism. The authors describe the identification of two MSUD suppressors—Spore killer-2 and 3. These Spore killers were first discovered as meiotic drive elements: progeny not bearing these elements in a Spore killer x wild type cross will fail to develop into mature ascospores.

Suppressors of zyg-1 define regulators of centrosome duplication and nuclear association in *Caenorhabditis elegans*

Authors: Catherine A. Kemp, Mi Hye Song, Murali Krishna Addepalli, Ginger Hunter, and Kevin F. O'Connell

In *C. elegans*, the kinase ZYG-1 is required for centrosome duplication. To identify factors that interact with ZYG-1, the authors identified 21 *szy* (suppressor of *zyg-1*) genes that, when mutated, restore partial viability to a *zyg-1* mutant. Thirteen of these suppressor mutations confer phenotypes of their own and define genes that function in a variety of cellular processes critical to cell division. Interestingly, several of the *szy* genes play a role in attaching the centrosome to the nuclear envelope. One such *szy* gene is identical to *sun-1*, a gene encoding a nuclear envelope component. The authors clearly show, however, that the role of SUN-1 in centrosome duplication is distinct from its role in attachment to the nuclear envelope.

LIN-61, one of two *Caenorhabditis elegans* MBT-repeat-containing proteins, acts with the DRM and NuRD-like protein complexes in vulval development but not in certain other biological processes

Authors: Melissa M. Harrison, Xiaowei Lu, and H. Robert Horvitz

MBT-repeat-containing proteins are transcriptional repressors that likely mediate repression by the binding of MBT-repeat domains to modified histones. This paper describes the analysis of the two MBT-repeat-containing proteins in *Caenorhabiditis elegans*, *lin-61* and *mbtr-1*. LIN-61 interacts with two other transcriptional-regulatory complexes, the LIN-35 Rb-containing DRM complex and the HDA-1 HDACI-containing NuRD-like complex, to control vulval development These findings suggest that at least some other MBT-repeat-containing proteins, including those in *Drosophila* and humans, might also interact with Rb or HDAC proteins.

Role of the mod(mdg4)common region in homolog segregation in *Drosophila* male meiosis.

Authors: Morvarid Soltani-Bejnood, Sharon E. Thomas, Louisa Villeneuve, Kierstyn T. Schwarz, Chia-sin Hong, and Bruce D. McKee

The Modifier of Mdg4 in Meiosis (MNM) protein plays a critical role in controlling homolog pairing in *Drosophila* male meiosis. Although previous studies demonstrated that an MNM-specific exon is required for homolog conjunction, they did not address whether the N-terminal common region, which includes a BTB domain that can mediate coalescence of protein-DNA complexes, is also required. The authors show that mutations in the N-terminal sequences shared by all Mod(mdg4) proteins also disrupt pairing and segregation, suggesting that BTB-mediated oligomerization may contribute to homolog pairing.

Experimental estimate of the abundance and effects of nearly neutral mutations in the RNA virus 6

Authors: Christina L. Burch, Sebastien Guyader, Haipeng Shen, and Daniel Samarov

Many mutations have a small effect size, which makes it a challenge to study their impact on distributions of allele frequency and mutational variance. This research makes use of a viral system with rapid generation to make accurate estimates of the natural mutational parameters, and tests the hypothesis that few mutations have a large effect on laboratory fitness. In contrast to recent observations in eukaryotes that very few (1-4 %) mutations have detectable effects on fitness, here more than one-third of spontaneous mutations in an RNA virus had detectable effects, suggesting that effect estimates based on laboratory fitness measures have often been substantially underestimated.

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From the December Issue of *GENETICS*

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Genetic similarities within and between human populations

Authors: David J. Witherspoon, Stephen Wooding, Alan R. Rogers, Elizabeth E. Marchani, W. Scott Watkins, Mark A. Batzer, and Lynn B. Jorde

Surprisingly, random pairs of people from two different populations are often genetically more similar than random pairs from the same population. This observation lies at the focal point of a recurring controversy between geneticists who stress the relative similarity of all humans, and those who focus on the power of genetic data to classify people into populations. Using accessible statistical methods and large data sets from diverse populations, the authors compare and reconcile these views of human genetic variation, and show that individuals can be safely assigned to their population of origin provided that hundreds of markers are used – despite pairs of individuals from different populations showing genetic similarities.

A maximum likelihood method for estimation of pairwise relatedness in structured populations

Authors: Amy D. Anderson and Bruce S. Weir

Technologies for scoring genotypes of vast numbers of markers in humans place a premium on methods for estimating the degree of genetic relatedness. These methods generally assume that the individuals are from a randomly mating population with known allele frequencies. The authors develop a maximum likelihood estimator that allows for individuals from a cryptically structured population, a common problem in human genetics.

Genome-wide association analysis in diverse inbred mice: power and population structure

Authors: Phillip McClurg, Jeff Janes, Chunlei Wu, David L. Delano, John R. Walker, Serge Batalov, Joseph S. Takahashi, Kazuhiro Shimomura, Akira Kohsaka, Joseph Bass, Tim Wiltshire, and Andrew I. Su

A method is developed in this paper making use of cis-acting expression QTL inferences to optimize an algorithm for genome-wide association testing. The approach makes use of a panel of diverse inbred mouse strains, which are phenotypically diverse and have high recombination rates, but are genetically stratified. An algorithm based on genome-wide genetic similarity and a weighted bootstrapping procedure is shown to perform well in substructured samples like these. Other merits of mapping with the Mouse Diversity Panel are elaborated.

Geneticists and Students Receive GSA Awards

Continued from page 4

the GSA sponsored 17th International *C. elegans* meeting, June 27-July 1, 2007 at UCLA. Postdoctoral researcher Chad G. Pearson will attend the FASEB Experimental Biology meeting on Mitosis, June 9-14, 2007, in Indian Wells, CA.

GSA presented two poster awards for students attending the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) meeting. Miguel Mata from the University of Texas at El Paso and Teresa Melinda Madrid, University of New Mexico, Albuquerque, were the recipients of these awards.

For additional information about the recipients and these awards, see the GSA website at http://www.genetics-gsa.org/.

Miguel Mata

Teresa Melinda Madrid

From the President's desk:

Continued from page 1

to hear the views of GSA members on the effectiveness of the JSC, which was formed and managed largely by the American Society for Cell Biology. Most importantly, what are the key public and scientific policy initiatives that need to be stimulated and communicated to members of Congress? Second, a committee led by Tim Schedl is formulating the views of GSA members on how NIH peer review in genetics can be improved. We hope that every member took the time last month to respond to the committee's questionnaire to provide your input. Third, GSA's journal, *Genetics*, is considering a plan to occasionally broaden its front matter to include essays addressing policy issues. Is this a worthwhile undertaking? Finally, as described elsewhere in this issue of the newsletter [see p. 5], the GSA will hold its second meeting to highlight the ongoing contributions of model organisms to advances in human biology and medicine. We urge every GSA member to attend and to participate. Our country, and the field of genetics, cannot afford another wait of 34 years to find the best road forward.

Sincerely,

Allan Spradling
GSA President
society@genetics-gsa.org or GSA2008@ciwemb.edu

Public Policy Update

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Zerhouni Backs Expanding the Use of Stem Cells

Before a Senate hearing in March on funding for the National Institutes of Health (NIH), NIH director Dr. Elias Zerhouni, surprisingly backed efforts to lift President Bush's restrictions on the use of embryonic stem cells for research.

In 2001, Bush imposed a limit on the use of embryonic stem cells for research purposes. At the time, there were 71 lines available for use. Of those, it is estimated only 21 lines have some viability, but most are contaminated and unsuited for treatment of humans.

At the hearing, Zerhouni stated, "From my standpoint, it is clear today that American science will be better-served, and the nation will be better-served, if we let our scientists have access to more stem cell lines."

Zerhouni has been reluctant in the past to openly disagree with the President. Yet, when Senator Tom Harkin (D-IA), a leading proponent for expanding President Bush's policy on embryonic stem cell research, questioned Zerhouni, his dissent came as a surprise to the backers of stem cell research.

The testimony comes weeks before the Senate is set to vote on stem cell legislation. This is identical to the bill that passed both houses of Congress before Bush vetoed it last summer. The bill, which aims to expand federal funding for and lift harsh restrictions on embryonic stem cell research, was passed earlier this year by the House, with a vote of 253-174, and has received very strong bipartisan support.

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Public Policy Update

by Lynn Marquis, Joint Steering Committee for Public Policy

The Genetic Information Nondiscrimination Act

Congress is on the verge of breaking a 12-year impasse over legislation that would ban discrimination as a result of the use of genetic information by employers and health insurers. H.R. 493, the Genetic Information Nondiscrimination Act (GINA) seeks to protect individuals from discrimination in health insurance and employment based on genetic information. On Jan. 16, 2007, Representatives Louise Slaughter (D-NY) and Judy Biggert (D-IL) introduced H.R. 493, the Genetic Information Nondiscrimination Act of 2007 with 165 cosponsors in the House and Senator Olympia Snowe (R-ME) introduced the Senate bill on Jan. 22, 2007, with 23 cosponsors.

For the Joint Steering Committee passage of this bill is long overdue. For scientists to realize the potential of cutting edge genetic technology, all barriers to participation in clinical genetic testing and clinical trials must be removed. But sadly, the concern about genetic discrimination is making men and women less likely to be tested.

Since 1996, some members of Congress have been working to pass this legislation that would prevent health insurers and employers from requesting or requiring genetic testing. GINA has passed overwhelmingly in the Senate since first introduced in 1996. Yet, the House has prevented a vote on this bill because of the opposition from the business community. Some business groups worry the bill could invite frivolous lawsuits by potential employees who believe they were turned down for jobs based on their genetic background, not their lack of relevant job skills.

By the time this newsletter is in print, GINA will likely have received a vote in the House of Representatives. President Bush has pledged his support of genetic nondiscrimination legislation and is expected to sign the bill if it passes in Congress.

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