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# GENETICS



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## From the President's desk:

2006, the 75th anniversary of the Genetics Society of America, will be marked by a number of initiatives to reinvigorate the Society's mission of promoting research and education in genetics. A highlight was the recently held GSA sponsored conference, "Genetic Analysis: From Model Organisms to Human Biology" in San Diego from January 5-7. This conference emphasized the importance of model organism research by illustrating the crucial contributions to human biology resulting from discoveries in these organisms. The National Institutes of Health (NIH) supported this conference both financially and by participation of key NIH administrators, including Jeremy M. Berg, director of the National Institute of General Medical Sciences.



In addition to the superb science talks by international leaders the MOHB conference showcased other important and new GSA initiatives including education, public policy advocacy, graduate student support and recognition of outstanding model organism geneticists. Robin Wright, Education Committee chair, led a round table discussion on undergraduate education and the Joint Steering Committee for Public Policy and the Congressional Liaison Committee sponsored a session on science advocacy and public policy. There was a mentor lunch to support graduate students and postdocs in the next steps of their careers, and the three GSA medals were presented during the banquet, with Victor Ambros receiving the GSA Medal, Fred Sherman the Beadle Award, and Masatoshi Nei the Morgan Award. (For research highlights at the meeting, see pages 6 and 7 of this issue.)

The 75th anniversary will also usher in changes to our society's journal, *GENETICS*. Since its inception in 1916, *GENETICS* has been the venue for some of the most significant papers in the field. It is important that it continue to publish papers focusing on genetic approaches in experimental organisms while keeping abreast of comprehensive changes in our field and adapting to the changing landscape of scientific publication. A number of innovations will be introduced to the journal this year, spearheaded by Editor-in-Chief Beth Jones and a stellar board of Senior Editors (see article on p. 3).

It is an exciting time for our Society as we expand its role and influence by advocating for basic research in genetics and the education of the next generation of researchers. As Barry Ganetzky steps up as President of the GSA, and Allan Spradling becomes Vice-President, we all look forward to an eventful and exciting 75th year for our Society.

Sincerely,

Terry Orr-Weaver  
Past President (2005)

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by The Genetics Society of America*

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# Dear Abbot:

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I'm really amazed at how the son of a poor farmer could become the "Father of Genetics." Who influenced you to hybridize those peas anyway?

Wondering in Washington



Dear Wondering,

I owe my success to my family, who sacrificed to help me go to school, and to my teachers, who encouraged me at every stage, even the most difficult. My first teachers, Thomas Makitta and Father Schreiber, helped my parents make the hard decision to send me away to school to the gymnasium in Troppau when I was twelve. They were all quite proud when I graduated with high honors in August, 1840. Afterwards, my physics professor at the University of Olmutz, Friederich Franz, recognized my potential and recommended me for a position at the St. Thomas Abbey at Brno. Of course, you know that the gardens in St. Thomas Abbey are where all those peas were crossed and grown. The abbot at St. Thomas, Cyril Napp, was another great teacher who supported my training at the University of Vienna. At Vienna, great teachers helped me master the foundational knowledge and approaches needed for my later experiments, particularly the use of mathematical approaches. So, you see, teachers made all the difference and one of my own personal joys has been teaching my own students at the Modern School in Brno.

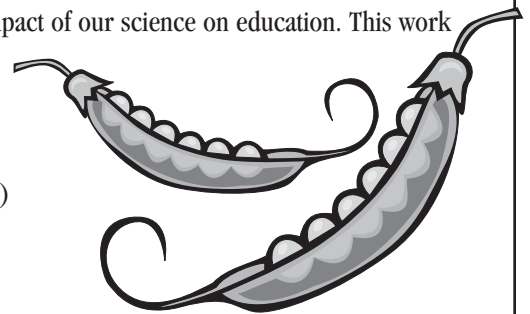
The Abbot\*

Like the Abbot, most of us can trace a great deal of our personal histories back to teachers who saw something special in us and nurtured that potential. I think back to Miss Koskoris in 5th grade science class who revealed the existence of an incredible world of protists cavorting in a murky hay-water solution. As I watched these amazing cells through the "microscope," really no more than a magnifying glass, I thought that, one day, I might understand how such unicellular organisms "worked." Miss Koskoris thought that was a great idea and helped me find books about the topic. I can trace my entire pathway from the present to the fifth grade by the markers set in place by a sequence of influential teachers. My guess is that your life is similarly marked by such guideposts.

In our careers as researchers, mentors, and professors, we all share the rare privilege of having many opportunities to influence the life history of others – to help them recognize the wonder and mystery of the world around them, to help them see beyond their perceived boundaries. This privilege is the foundation of teaching and the essence of education, a privilege that is intimately interwoven with our research endeavors and success.

The Genetics Society of America is taking a fresh and serious look at increasing the impact of our science on education. This work falls on the shoulders of the new GSA Education Committee:

- Kenneth Burtis** (University of California, Davis; [kcburtis@ucdavis.edu](mailto:kcburtis@ucdavis.edu))
- Daniel Lew** (Duke University; [daniel.lew@duke.edu](mailto:daniel.lew@duke.edu))
- Phillip Meneely** (Haverford College; [pmeneely@haverford.edu](mailto:pmeneely@haverford.edu))
- Patricia Pukkila** (University of North Carolina, Chapel Hill; [pukkila@unc.edu](mailto:pukkila@unc.edu))
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- Timothy Stearns** (Stanford University; [stearns@stanford.edu](mailto:stearns@stanford.edu))
- Robin Wright** (University of Minnesota; [wrightr@umn.edu](mailto:wrightr@umn.edu))



We will use the "Ask the Abbot" column to disseminate teaching tips, curricular developments, and reviews of new educational resources, and *we invite you to contact any of us with your ideas for this column*. More importantly, *we seek your views concerning directions the society should go in its efforts to support and enhance the work of its members as they teach genetics and change lives*.

Robin Wright  
[wrightr@umn.edu](mailto:wrightr@umn.edu)  
612-624-1032

\* To read more about Mendel's biographies, see *Gregor Mendel's Experiments on Plant Hybrids, A Guided Study*, by Corcos & Monaghan (Rutgers University Press, 1993) and *The Monk in the Garden*, by Henig (Mariner Books, Houghton Mifflin, 2001)



## Board of Senior Editors for GENETICS



Suzanne Sandmeyer



Vicki Chandler



Andrew Clark



R. Scott Hawley



Mark Johnston



Paul Sternberg

Six Senior Editors were appointed by the GSA Board to assist Editor-in-Chief Beth Jones and help her continue to provide a broad perspective for the journal *GENETICS*. They are: Suzanne Sandmeyer (Chair), Vicki Chandler, Andrew Clark, R. Scott Hawley, Mark Johnston, and Paul Sternberg. New initiatives to keep *GENETICS* abreast of research changes will be considered. They seek to expand the breadth of the Journal to better emphasize developing areas such as genomics while strengthening the role the Journal has long played in providing a forum for genetic analysis of experimental organisms and population genetics. These changes are designed to further enhance the Journal's visibility and recognition.

The Senior Editors represent the diverse interests of our research community and they all have experience as associate editors of the Journal. Suzanne Sandmeyer is a professor at the University of California, Irvine, whose research focuses on yeast genomics and transposable elements. Vicki Chandler, a professor at the University of Arizona, has been recognized for her work on gene expression and epigenetics in maize with an NIH Pioneer Award. Andrew Clark is Professor of Population Genetics at Cornell University exploring *Drosophila* and human quantitative genetics. R. Scott Hawley has a longstanding interest in chromosome segregation in meiosis, investigating mechanisms in humans, *Drosophila*, and zebra fish at the Stowers Institute where he is an investigator. Mark Johnston, a professor at Washington University School of Medicine, focuses on comparative and functional genomics in yeast. Paul Sternberg's research addresses how genes control development and behavior. A professor at Cal Tech, he has played a leading role in database development for the *C. elegans* community. Please help the Senior Editors maintain our premier Journal by giving them your ideas and suggestions.

## 2006 GSA Officers on Board

We congratulate Allan Spradling (Carnegie Institution, Baltimore) on his election as Vice-President (President-elect). And we welcome new Board members Kathryn Barton (Carnegie Institution, Stanford), Mike Snyder (Yale University), and Mariana Wolfner (Cornell University). All of these new GSA officers will serve through 2008.

Barry Ganetzky (University of Wisconsin, Madison), steps up as President of the Board as Terry Orr-Weaver (Whitehead Institute – MIT), becomes the Past President. Mark Johnston, Past President, (Washington Univ School of Medicine, St. Louis), steps down from the Board as do directors, Jim Haber (Brandeis University), Maynard Olson (University of Washington, Seattle) John Postlethwait (University of Oregon) and Trudi Schupbach (Princeton University).

Special thanks go to Bruce Weir (North Carolina State University) for his long service to the Society. Bruce, who has served with distinction as treasurer since 2002, has stepped down. Trudy Mackay (North Carolina State University) takes over from Bruce, and we warmly welcome her to the GSA Board.

The GSA thanks all outgoing Board members for their past years of service to the Society.



Barry Ganetzky



Allan Spradling



Kathryn Barton



Mike Snyder



Mariana Wolfner



## GSA WEB EDITOR NEEDED

*Please pass this ad on to interested colleagues and nominate qualified individuals.*

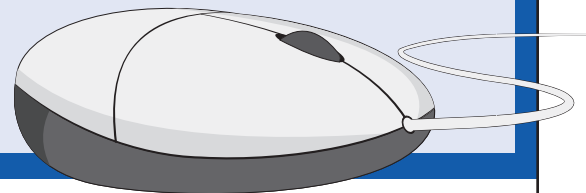
Consider contributing to the mission of the GSA by serving as Editor of the Web site (<http://www.genetics-gsa.org/>). If you are a Ph.D.-level geneticist, with a knowledge of, or strong interest in, Web site development, and you have a flair for design, contact:

Elaine Strass,  
Executive Director, GSA  
[estrass@genetics-gsa.org](mailto:estrass@genetics-gsa.org)

### **GSA Web Site Editor Job Description**

Job Description: to develop and maintain existing Web site, keeping information current and user-friendly, so as to facilitate communication among members and provide educational materials for educators, the media, the public and others.

1. Oversee development and maintenance of home page.
2. Work with Web Technical Manager in the GSA office to implement necessary updates and new ideas.
3. Survey possible sites for linking.
4. Keep Society activity descriptions current.
5. Effect design of Web pages for information such as: media information for teachers, students, reporters and science writers; frequently asked questions for general public; professional education for academicians, undergraduate instructors and high school biology teachers; career development guidance; positions available for post-docs and PI's.
6. Report to the GSA Board of Directors on Web usage.
7. This position requires a minimum of 16-20 hours per month effort.
8. A stipend will be provided.



## Yeast Meeting This Summer!

The picturesque campus of Princeton University will be the setting for the 2006 Yeast Genetics and Molecular Biology Meeting this summer, July 25th – 30th. Attendees from all over the world are expected. The Web site for abstract submission will open March 1 and online registration will be available March 13th at the meeting Web site, <http://www.yeast-meet.org/>.

Featured speakers and award winners include

- Fred Sherman (University of Rochester), the recipient of the Lifetime Achievement Award;
- Kim Nasmyth (University of Vienna), delivering the Lee Hartwell Lecture;
- Chris Guthrie (UCSF), presenting the Winge-Lindgren Address;
- Charlie Boone (University of Toronto), recipient of the Ira Herskowitz Award.

In addition, the GSA will give awards for outstanding poster presentations.

Travel awards will be available for graduate students and postdocs who are making presentations at the meeting and who may require some financial support to attend the meeting. Typically, awards cover the cost of housing and meeting registration; travel costs may also be considered. To apply, send a copy of your abstract; your curriculum vitae; and a short paragraph describing your need to: GSA, YGM Financial Assistance, 9650 Rockville Pike, Bethesda, MD 20814. Deadline for applications is April 4, 2006. No e-mail applications will be accepted. Successful applicants will be notified by mid-June.

Microphone runners are also being solicited by the YGM organizers. Eighteen (18) students are needed to handle microphones during question and answer periods at platform sessions and symposia. Duties will include carrying a microphone to individuals who wish to ask questions and turning on and off the mic for them at appropriate times. Applicants must attend an evening training session on July 25th and attend the entire meeting. Grad students will receive \$120 for staffing five 90-minute sessions throughout the meeting. Deadline for receipt of applications is April 4, 2006. For specific application information, refer to the meeting Web site.

For more information about the meeting, awards, and deadlines, check the 2006 Yeast Genetics and Molecular Biology meeting Web site at <http://www.yeast-meet.org/>.



# From the February Issue of *GENETICS*

by R. Scott Hawley

These upcoming articles may be of interest to you:

## **Title: No patrigenes required for femaleness in the haplodiploid wasp *Nasonia vitripennis***

Authors: Leo W. Beukeboom and Albert Kamping

For the wasp *Nasonia vitripennis*, an emerging model organism, males arise parthenogenetically from fertilized eggs while females arise from diploid fertilized eggs. This leads to the idea that a paternal contribution is required for female development of this organism. However, these authors have obtained a polyploid mutant strain that produces daughters from diploid unfertilized eggs. Thus, a paternal contribution is not required for female development in this species, necessitating reformulation of existing models for its sex determination.

## **Title: Neuropathology in *Drosophila* membrane excitability mutants**

Authors: Tim Fergestad, Barry Ganetzky, and Michael J. Palladino

In a thorough and genetically elegant paper, the authors demonstrate that mutations affecting Na<sup>+</sup> channels and K<sup>+</sup> channels that alter neuronal membrane excitability can trigger neurodegeneration. Their observations suggest an important link between maintenance of proper neuronal signaling and maintenance of long-term nerve viability, and suggest that human channelopathies can be modeled in *Drosophila*.

## **Title: Assessing the fidelity of ancient DNA sequences amplified from nuclear genes**

Authors: Jonas Binladen, Carsten Wiuf, M. Thomas P. Gilbert, Michael Bunce, Ross Barnett, Greger Larson, Alex D. Greenwood, James Haile, Simon Y. W. Ho, Anders J. Hansen, and Eske Willerslev

Although ancient DNA analysis has relied almost exclusively on mitochondrial sequences, the successful recovery of ancient nuclear DNA sequences is increasingly being reported. These authors compare their ability to recover useful sequences from nuclear and mitochondrial DNA obtained from ancient samples. Surprisingly they find that the fraction of miscoding lesions in nuclear DNA is not significantly higher than the fraction of such lesions observed in mitochondrial DNA. The characterization of the types and frequencies of such lesions in both nuclear and mitochondrial DNA leads the authors to suggest great caution in carrying out studies of ancient DNA samples.

## **Title: Transposon insertions of *magellan-4* that impair social gliding motility in *Myxococcus xanthus***

Authors: Philip A. Youderian and Patricia Hartzell

*M. xanthus* is a bacterium that exhibits social motility, a process that permits groups of cells to glide through the media. Youderian and Hartzell present the results of a screen for mutants reduced social motility. They identify 31 new genes required for this process. Surprisingly, three mutations that abolish social motility lie within genes predicted to encode glycolytic enzymes, suggesting that at least one of the signals for pilus retraction may be a simple product of exopolysaccharide catabolism.

## **Title: The role of the N-terminal ologopeptide repeats of the yeast Sup35 prion protein in propagation and transmission of prion variants**

Authors: Irina S. Shkundina, Vitaly V. Kushnirov, Mick F. Tuite, and Michael D. Ter-Avanesyan

Prions are proteins that take on meta-stable abnormal structures that reduce their function and often lead to disease. How some proteins but not others take on these abnormal structures is of great interest. The yeast prion protein Sup35, a translation termination factor, provides an excellent window into this process. Michael Ter-Avanesyan and colleagues have nicely defined the prion-forming region of Sup35, and provided insight into how it can form several different abnormal structures that can propagate in cells.



# Scintillating Model Organism/Human Biology Meeting



## GENETIC ANALYSIS: Model Organisms to Human Biology

More than 350 of our colleagues traveled to sunny San Diego, CA to kick off GSA's 75th anniversary year at the new GSA meeting, "Genetic Analysis: Model Organisms to Human Biology." They were rewarded with amazing presentations from outstanding geneticists working across a broad spectrum of experimental organisms. One of the meeting's messages – how studies of model organisms can lead to the understanding of human biology (and malfunctions thereof) – came through loud and clear. We heard how yeast and flies can be used to study

(and possibly find drugs to fight) Huntington's disease (Laszlo Bodai, UC-Irvine and Flav Giorgini, UW-Seattle), and how heart disease can be investigated in fruit flies (Karen Ocorr, Burnham Inst.). We saw obese yeast (Sepp Kohlwein, IMB, Austria), mice with Obsessive Compulsive Disorder (Mario Capecchi, Univ. of Utah) and colon cancer (Bill Dove, UW-Madison), worms with craniofacial disorders (Ann Corsi, Catholic Univ.), fruit flies with brain tumors (Renee Read, Salk), and yeast with Parkinson's disease (Susan Lindquist, MIT). We learned how studies of algae can reveal genes responsible for ciliary defect syndromes in humans (Susan Dutcher, Washington Univ.), how a gene in *Drosophila* might offer therapy for lung cancer (Mark Mortin, NICHD), how leukemia can be modeled in fruit flies (Utpal Banerjee, UCLA), and how yeast might be tapped to improve human nutrition (Jasper Rine, UC-Berkeley).

But the meeting was not solely focused on human disease. Allan Orr and colleagues (Univ. of Rochester) amazed us with the seemingly impossible feat of crossing individuals of different species to learn about mechanisms of speciation. David Kingsley (Stanford) described how his lab has exploited stickleback fish to identify genes that drive morphological evolution. We heard about fantastic technologies that promise, in the not too distant future: the ability to determine the DNA sequence of large genomes for only a few thousand dollars; the *de novo* synthesis of whole genomes; ultrasensitive detection of proteins for diagnostics (George Church, Harvard; Ron Davis, Stanford; Lee Hood, Inst. for Systems Biol.). In between, were excellent talks on subjects such as gene dosage compensation, stem cell development, and the cell cycle.

Over 250 posters on diverse subjects and of high quality were displayed throughout the meeting, and were intensively discussed at two poster sessions. Several of the submissions were chosen for short oral presentations, which were very well received.

There were three outstanding keynote talks: Paul Nurse (Rockefeller) described genomic approaches he and his colleagues

## KEYNOTE SPEAKERS



Paul Nurse (Rockefeller Univ) opens the conference with an address on *S. pombe*.



Mary-Claire King (Univ of Washington, Seattle) summarizes what we know of inherited breast cancer in her address to participants on day 2 of the meeting.



Sydney Brenner (Salk Institute) wraps up the conference for participants with his address on model organisms.

## AWARDEES



Anita Hopper (r) presents Fred Sherman (Univ of Rochester) with the George W. Beadle medal for outstanding contributions to the community of genetics researchers.



Masatoshi Nei (I) (Penn State Univ) receives the Thomas Hunt Morgan Medal from Trudy Mackay in recognition of his lifetime contributions to the field of genetics.



Geraldine Seydoux (I) presents Victor Ambrose (Dartmouth Medical School) with the GSA medal for outstanding contributions to the field of genetics for the past 15 years.



# Kicks Off GSA's 75th Year

are applying to the study of the "other" yeast, *S. pombe*; Mary-Claire King's (UW-Seattle) uplifting talk summarized our understanding of inherited breast cancer; long-time GSA member Sydney Brenner wrapped up the meeting by admonishing us to add humans to our list of "model organisms" (and to renew our membership in the GSA).

*Continued on page 11*

**Captions for photo collage below.** **A** GSA Meetings Manager Anne-Marie Mahoney (l) and Past President Terry Orr-Weaver have a relaxing moment at the conference. **B** Mark Johnston, (l), (Washington Univ School of Medicine, St. Louis), ceremoniously hands over the official meeting timer to Steve Elledge (Harvard Medical School). **C** GSA Board secretary, Anita Hopper with Suzanne Sandmeyer, chair, GSA Senior Editors board. **D** Katherine Gardner (l) at her poster with colleague Renee Read. **E** Morgan award recipient Masatoshi Nei and Chuck Langley, a session co-chair in discussion. **F** Lynn Marquis, national coordinator of the Joint Steering Committee for Public Policy and Elaine Strass, GSA Executive Director at the MOHB meeting. **G** GSA Board member Susan Dutcher (l) speaks with Robert Waterston, GSA member and recipient of the 2005 Genetics Prize of the Peter Gruber Foundation. **H** 2006 GSA President Barry Ganetzky introduces speaker Sydney Brenner. **I** Stem cell genetics speaker Judith Kimble (r) speaks with GSA member Bill Dove during a break. **J** Beadle Award Recipient Fred Sherman (l) in discussion with Board member Stan Fields (c), and GSA member David Kaback. **K** Neurological diseases speaker Susan Lindquist with GSA Board member Tom Cline and GSA member Steven Henikoff during a break. **L** GSA member Jasper Rine has a laugh during a session break.

*Photos by Elaine Strass, Tracey DePellegrin-Connelly and Brett Nelson.*

## MENTOR LUNCHEON

Susan Dutcher (far right) (Washington Univ School of Medicine, St. Louis), listens as students talk during the Mentor Luncheon.



Scott Hawley (far right) (Stowers Institute, Kansas City) talks with students at the Mentor Luncheon on Friday.





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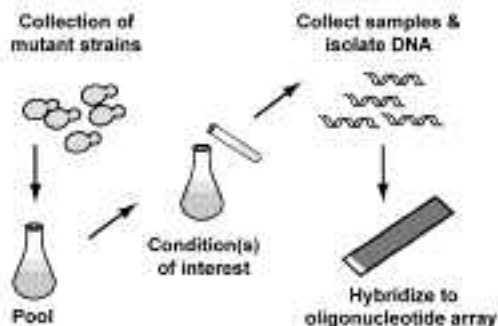
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<sup>1</sup>Tong *et al* (2001) *Science* 294, 2364–2368

<sup>2</sup>Pan *et al* (2004) *Molecular Cell* 16, 487–496

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# Community Resources for *Saccharomyces cerevisiae*

by Michael Snyder and Daniel Gelperin, Yale University

The -omics era has fostered a wealth of genomewide reagents to study gene and protein function. Nowhere has this been more evident than in the budding yeast, *S. cerevisiae* in which many reagents have been described.

Genome-scale reagents for studying yeast include: a) transposon insertion libraries with  $\beta$ -galactosidase and hemagglutinin (HA) protein tags; b) “bar-coded” gene deletion collections; c) collections of essential genes under the control of inducible promoters; d) overexpression arrays for purifying yeast proteins and for screening for overexpression phenotypes; and e) libraries of genes fused to GFP, the TAP-tag, and the HA epitope. All yeast ORFs are available in versatile cloning vectors for transfer into any vector of interest. Finally, DNA microarrays (or reagents for constructing them) are available for following gene expression, transcription factor binding and gene disruption phenotypes; protein microarrays are also available for a variety of biochemical reactions. A summary of the different reagents and where to obtain them is presented below. Many other useful reagents can be found through the *Saccharomyces* genome database (SGD; [www.yeastgenome.org/](http://www.yeastgenome.org/)) and Web site links.

Most of these reagents have been prepared in the last five years and most have been made available well in advance of publication. Additional reagents for the community are expected to be forthcoming, and promise to make the power of yeast genetics even more awesome than it already is.

REAGENT	DESCRIPTION	WHERE TO OBTAIN THEM	REFERENCE
<b>REAGENTS FOR STUDYING PHENOTYPES</b>			
Transposon Tagging/ Mutagenesis Libraries	Libraries for mutagenizing yeast and tagging genes with <i>lacZ</i> and HA coding sequences	Libraries: Snyder lab. Many strains and plasmids: Open Biosystems: <a href="http://www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/">www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/</a>	Burns et al. (1994) <i>Genes Dev</i> 8:1087-1105; Ross-Macdonald et al. (1999) <i>Nature</i> 402:413-8.
Yeast Knockout Collection	Collection of >6000 strains in which a KanMX marker and barcode replaces each ORF, available in haploid or diploid strains	Open Biosystems: <a href="http://www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/Yeast%20Knockout%20Strains/">www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/Yeast%20Knockout%20Strains/</a>	Giaever et al. (2002) <i>Nature</i> 418:387-391.
Tet promoter collection	Haploid collection with 800 essential genes under the control of the Tet inducible promoter	Open Biosystems: <a href="http://www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/Yeast%20Tet%20Promoter%20Hughes%20Stra/">www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/Yeast%20Tet%20Promoter%20Hughes%20Stra/</a>	Mnaimneh et al., (2004) <i>Cell</i> 118:31-44.
<b>REAGENTS FOR STUDYING PROTEIN EXPRESSION, LOCALIZATION AND BIOCHEMICAL ACTIVITIES</b>			
ORF Collection in Movable Expression Vector	Each yeast ORF without translation termination codon cloned into a yeast HisX6::ZZ domain expression vector with GATEWAY sites	Open Biosystems: <a href="http://www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/">www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/</a>	Gelperin et al. (2005) <i>Genes Dev</i> , 19:2816-26.
Same ORF collection in the GATEWAY entry vector	Each yeast ORF without translation termination codon cloned into a GATEWAY entry vector	Coming Soon (2006): Snyder Laboratory	
GST Fusions Expression Collections	Collection of Yeast ORFs fused at their N terminus to GST coding sequences for overexpression under Gal control	Phizicky Laboratory: <a href="http://dbb.urmc.rochester.edu/labs/phizicky/index.html">http://dbb.urmc.rochester.edu/labs/phizicky/index.html</a> Snyder Laboratory <a href="http://www.yale.edu/snyder/">www.yale.edu/snyder/</a>	Martzen et al., (2000) <i>Science</i> 286:1153-5; Zhu et al. (2001) <i>Science</i> 293:2101-5.
GFP Tagged Collection	Collection of yeast endogenous genes tagged at their carboxy terminus with GFP	Invitrogen: <a href="http://clones.invitrogen.com/cloneinfo.php?clone=yeastgfp">http://clones.invitrogen.com/cloneinfo.php?clone=yeastgfp</a>	Huh et al. (2003) <i>Nature</i> 425:686-91.
TAP Tag Collection	Collection of yeast endogenous genes tagged at their carboxy terminus with a tandem affinity tag	Open Biosystems: <a href="http://www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/">www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/</a>	Ghaemmaghami et al. (2003) <i>Nature</i> 425:737-741.
Beta-galactose and HA Tag Collection	Collection of strains and plasmids tag with endogenous yeast genes tagged <i>lacZ</i> and HA using the transposon library above	Open Biosystems: <a href="http://www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/">www.openbiosystems.com/Genomics/Model%20Organism%20Resources/Yeast%20Resources/</a> ; Snyder Laboratory	Ross-Macdonald et al. (1999) <i>Nature</i> 402:413-8.
Yeast Two Hybrid Collection	Yeast ORFs cloned into Gal4 activation domains and DNA binding domains; available as pools of transformants	Fields laboratory: <a href="http://depts.washington.edu/sfields/">http://depts.washington.edu/sfields/</a>	Utez et al. (2002) <i>Nature</i> 403:623-7.
<b>PROTEIN MICROARRAY REAGENTS</b>			
Protein Microarray	Protein microarray containing >4000 yeast proteins	Invitrogen: <a href="http://www.invitrogen.com/content.cfm?pageid=10397#yeast">www.invitrogen.com/content.cfm?pageid=10397#yeast</a>	Zhu et al. (2001) <i>Science</i> 293:2101-5.
<b>DNA MICROARRAY REAGENTS</b>			
Gene Expression Microarrays	DNA microarrays for monitoring expression	ORF Primers: Oligonucleotides for each ORF (for spotting) <a href="http://www.operon.com">www.operon.com</a> . Arrays: Affymetrix: <a href="http://www.affymetrix.com">www.affymetrix.com</a> Agilent <a href="http://www.agilent.com">www.agilent.com</a>	
Yeast Intergenic Microarrays	Arrays useful for mapping transcription factor binding sites using ChIP chip and assaying intergenic regions	Primers: Invitrogen/ResGen: <a href="http://www.invitrogen.com">www.invitrogen.com</a> Arrays: Agilent: <a href="http://www.agilent.com">www.agilent.com</a>	Iyer et al. (2001) <i>Nature</i> 409:533-8.
Barcode Microarrays	For following phenotypes of yeast deletion strains, SLAM	Yeast Barcode Array Consortium, Agilent: <a href="http://www.agilent.com">www.agilent.com</a>	Shoemaker et al. (1996) <i>Nature Genetics</i> 14:367-70; Winzeler et al. (1999) <i>Science</i> 285:901-906; Pan et al. (2004) <i>Mol Cell</i> 16:487-96.



# Teaching Moments: Last Minute Opportunities

by Wendy Raymond, Williams College, Williamstown, MA

How exasperating! On the day of the genetics midterm, students jam into your office to ask questions whose answers they should already know. You'd swear you'd never laid eyes on some of these students before today, though class has met every Monday, Wednesday, and Friday for the past six weeks. Why didn't they seek help earlier in the semester? Frustration shows in your voice, then on your face. Just before fully losing your temper, you remember your own behavior immediately preceding that last externally imposed deadline. "Did I have days, hours, or only minutes to spare before dropping my grant proposal into the FedEx box?"

However ineffective, working up to the last minute is a common human strategy. Whether we're heading toward a genetics exam or a grant proposal due date, good time management often eludes us. So you emerge from your momentary office-hour reverie with a little more compassion for the students in your office. (That in itself will help you communicate more effectively, as it conveniently and simultaneously lowers your blood pressure.) But a much more profound strategy now emerges: *use your students' exceptional attentiveness near deadlines to TEACH them*. With their adrenalin high and their attention concentrated on genetics (for once), these students are motivated to learn.

Tell them what you've already told them but tell it to them in a different way. Extend their grasp by posing a question that forces them to apply their knowledge. Use an exam question that they'll see in just a few hours. Students in this randomly assembled, mixed-ability "study group" will help teach one another under your guidance.

Dave Stadler, a well-known geneticist and teacher, taught me this trick when I embarked on my own teaching career. Dave, now Professor Emeritus in the Department of Genome Sciences at the University of Washington, Seattle, went so far as to encourage me to teach students during an exam. His advice was right on the mark. Without giving an answer away, one can lead individual students to a launching-off point that they might not have reached alone.

Deciding to take any moment, even a last minute "cram session," as a teaching opportunity opens minds (and dare I say hearts) to the fascinations of genetic analysis.

Idealistic? Perhaps. Effective? I have no measures of resultant student learning. But for Dave and for me, this approach transforms one of the most stressful teaching times into one of the most rewarding.

## 2006 DeLill Nasser Recipients Announced

Congratulations to the five recipients of the DeLill Nasser award, a travel award for graduate students and postdoctoral trainees to enable them to attend national and international meetings and enroll in laboratory courses. The award is named in honor of the late DeLill Nasser, who served as program director of the National Science Foundation's Eukaryotic Genetic Section for 22 years and who strongly supported young scientists. The 2006 awardees, announced at the MOHB meeting in January, and their affiliations are:

- **Kirki Tsigari**, PhD Student, Alexander Fleming Biomedical Research Institute in Athens, Greece
- **Atina G. Cote**, PhD Student, Hospital for Sick Children, University of Toronto, Canada
- **Anjon Audhya**, Post Doctoral Fellow, Ludwig Institute for Cancer Research, LaJolla, California
- **Gil B. Carvalho**, Graduate Student, California Institute of Technology, Pasadena, California
- **Elissa P. Lei**, Post Doctoral Fellow, The Johns Hopkins University, Baltimore, Maryland

## DROS Registration and Late Abstract Submission Still Open

There's still time to register for the 47th Annual Drosophila Research Conference, March 29th – April 2nd in Houston, Texas. Reduced rate early registration is available until February 24th. Hotel accommodations at the Hilton Americas-Houston are available at conference rates until February 27th. Late abstracts may be submitted until Friday, March 3rd.

For more information, see the meeting Web site at <http://www.drosophila-conf.org/>.



## Need an Employee? Need a Job?

Check out the GSA online "Open Positions" Web site at [http://genetics.faseb.org/genetics/g-gsa/open\\_positions.shtml](http://genetics.faseb.org/genetics/g-gsa/open_positions.shtml).

Job listings are up-to-date; they're posted as they are received and removed after 12 weeks. GSA members can have openings posted at no charge. Fees are charged for nonmember postings. See the Web site for complete details.



## MOHB Meeting

*Continued from page 7*

Many scientist-educators in attendance enjoyed the educators' lunch organized by GSA Education Committee Chair Robin Wright (Univ. of Minnesota). Utpal Banerjee's (UCLA) inspiring presentation on research-focused courses he developed "to help undergraduates learn to think like scientists" stimulated further discussion on how teaching laboratories can be used for authentic scientific investigation. Another workshop on biomedical research advocacy, led by Lynn Marquis, the new national coordinator of GSA's public policy arm – the Joint Steering Committee for Public Policy (jscpp.org) – was well attended and galvanized people to contact their elected representatives and tell them of the importance of our work.

Based on the preliminary results from the meeting survey and on comments heard (and overheard) throughout the meeting, it was a resounding success. With scientific meetings becoming more specialized every year (e.g., yeast, *Drosophila*, *C. elegans*, chromatin remodeling, RNAi, cell cycle, even NF-kB and p53 meetings!), attendees appreciated the meeting's broad scope and enjoyed their interactions with a diverse group of colleagues. This new GSA meeting brought together geneticists of all stripes who discovered that they have a lot in common and are enriched by getting together to talk about it.

Because the respondents to the survey were unanimous in their desire to have this meeting held again, the next one is already being planned for January 2008 by a committee of GSA Vice President Allan Spradling, President Barry Ganetzky, and Past President Terry Orr-Weaver. Watch this newsletter (and your e-mailbox) for further information, and **plan to join us in January 2008 for the bi-annual GSA meeting.**

## 2006 Membership Dues

### REMINDER

**It's not too late . . .** to still pay your 2006 GSA membership dues. Join online at: [http://genetics.faseb.org/genetics/g-gsa/application\\_forms.shtml](http://genetics.faseb.org/genetics/g-gsa/application_forms.shtml). Don't delay and deny yourself the discounts to GSA-sponsored meetings, reduced publication fees for articles published in the GSA *GENETICS* Journal and the fellowship with over 3,000 colleagues in genetics!

## Public Policy Update

*Continued from page 12*

Under this bill the NSF will receive \$5.65 billion, an increase of \$181 million over last year and \$49 million above the budget request. The bill includes \$4.39 billion for research, \$167 million over last year; and \$807 million for education and human resources, \$70 million above the request.

This funding represents a slight rebound from the budget cut in 2005. Set against an overall Bush administration plan to reduce spending on domestic programs by -1.0%, this outcome for NSF is considerably better than expected. However, with inflation at nearly 4 percent, in real dollar terms, the \$5.65 billion total is less than the same \$5.6 billion of 2004. The 2006 total includes \$48 million in polar icebreaking costs that were previously funded by the Coast Guard, and the 2006 R&D portfolio barely matches the 2003 level in inflation-adjusted dollars. These smaller increases and new priorities in recent years have downsized NSF grant and funding success rates.

This may not be the last word on NSF funding, as Congress is exploring a range of options to pay for Gulf Coast hurricane damage. One alternative is a retroactive reduction of all FY 2006 appropriations by two or three percent.

## DROSOPHILA AND SMALL INSECT CHAMBER

Incubators with controlled temperature, lighting, and humidity for research with drosophila, mosquitos, aphids, wasps, etc. Chambers have a 5–40° C temperature range, coated coils, RH meter, casters...and a range of other features, depending on the level of sophistication needed. Six sizes (from 6 c.f. to 72 c.f. capacity) and four levels of temp/humidity control. Mini walk-in sizes are available for behavioral studies.



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## Public Policy Update

*by Lynn Marquis, Joint Steering Committee for Public Policy*

### **NIH Faces First Budget Cut in 36 Years**

On December 21st, Congress gave the final nod approving the Fiscal Year 2006 Labor-Health and Human Services-Education Appropriations Bill (Labor-HHS), which includes funding for the National Institutes of Health (NIH). President Bush signed the bill on December 30th.

According to the final Labor-HHS bill the NIH was slated to receive a slight increase of \$253 million, or about 1 percent, over fiscal year 2005 funding. However, an across-the-board cut contained in another spending bill leaves NIH with a budget of \$28.253 billion – a decrease of 0.1 percent. This is the first NIH budget cut since 1970.

Recognized as the nation's premier biomedical research agency, the NIH has always enjoyed bipartisan support. After factoring in the cost of inflation, the final 2006 budget leaves NIH with less money than it received in 2003. With research costs increasing, the NIH now faces the daunting task of cutting budget allocations among its programs including grants. Based on the NIH budget request, it had projected a decline in the number of research project grants (RPGs) for the second year in a row, but the one percent across-the-board cut could further reduce RPGs.

Because the Bush administration has continued to emphasize its goal of flattening or reducing domestic discretionary spending in 2007 and future budgets, the FY 2007 budget request, due in early February, is unlikely to offer better news for NIH.

### **NSF Funding Gets Slight Increase**

Before Thanksgiving, President Bush signed into law the Commerce-Justice-State Appropriations bill (CJS) which funds, among other agencies and government departments, the National Science Foundation (NSF) for the Fiscal Year 2006.

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