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Volume 2 Issue 2

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## DOE Lab Directors Discuss JGI Future

Senior management representatives from five national laboratories—Lawrence Berkeley, Lawrence Livermore, Los Alamos, Pacific Northwest, and Oak Ridge—convened on March 2 at the JGI Production Genomics Facility to discuss

the Memorandum of Understanding governing the ongoing operations of the JGI. Ari Patrinos, Associate Director for Environmental and Biological Research of the DOE Office of Science, also joined the day-long discussion organ-



**PARTICIPANTS IN THE MARCH 2ND DIRECTORS MEETING AT THE JGI-PGF.** Back row left to right: Peggy Folta (LLNL), Jim Bristow (JGI), Richard Gibbs (Baylor College of Medicine), Cherry Murray (LLNL), Paul Gilna (LANL), Steve Colson (PNNL), Donald Cobb (LANL), Len Peters (PNNL), Jeff Wadsworth (ORNL), Graham Fleming (LBNL), Reinhold Mann (ORNL), Susan Lucas (JGI); Front Row: Ari Patrinos (DOE OBER) David Galas (Keck Graduate Institute) Pier Oddone (LBNL), Elbert Branscomb (LLNL), Mike Anastasio (LLNL) and Eddy Rubin (JGI).

ized by ORNL Director and former LLNL Deputy Director Jeff Wadsworth.

“The bottom line was a major endorsement for JGI’s accomplishments, increased interest in expanding the linkages between the JGI and the partner labs, and a resounding thumbs-up for enhancing JGI’s visibility and contributions to advancing DOE science,” said JGI Director Eddy Rubin.

## JGI LAUNCHES IMG—NEW DATA CLEARINGHOUSE

Members of the team that made the new Integrated Microbial Genomes (IMG) system possible gathered with supporters on March 1 to celebrate the release of this powerful data management platform that supports timely analysis of genomes from a comparative, functional, and evolutionary perspective. The IMG system currently features over 200 organisms, with an additional 200 already in the queue for 2005. IMG, the result of a collaboration between the JGI and Berkeley Lab’s Biological Data Management and Technology Center



(BDMTC), is accessible to the public at <http://img.jgi.doe.gov/>. Nikos Kyrpides of JGI’s Microbial Genome Analysis Program (MGAP) provided scientific leadership and overall coordination for the IMG project. MGAP manages the

IMG’s data content and curation and helped develop the system, with additional support provided by JGI’s Microbial Ecology and Genome Data System groups.

Pictured are (back, from left to right): Falk Warnecke, Athanasios (“Thanos”) Lykidis, Greg Werner, Konstantinos (“Kostas”) Mavrommatis,

Iain Anderson, Nikos Kyrpides, Natalia (“Natasha”) Ivanova, Annette Greiner, Eddy Rubin, Anu Padki, Ernest Szeto, Krishna Palaniappan, Kristen Taylor, Amber Shao, Sam Pitluck; and (front): Phil Hugenholtz, Xueling Zhao, Victor Markowitz, and Shane Brubaker.

## JGI FACES

# Sandra McFarland—Peace at JGI

The arresting smell of Turkish coffee wafts through the reception area of Building 100. The culprit beams, with a hot vessel in hand; her welcoming smile has more than just a hint of mischievousness to it, and it comes with an offer. “Coffee, with or without surprise?” asks Sandra McFarland, the jokester, and JGI Finance/Materials Manager.

She’s the first to admit that she doesn’t look like a Sandra McFarland. “I was born in Damascus, Syria. My parents named me Salam, which means peace. I was born during a coup d’etat against the regime in Syria. All the Middle East was in turmoil of war. There was a whole generation, girls and boys, named Salam because people were looking for peace. Not much has changed in the Middle East—everybody is still looking for Salam and I tell them I’m in Danville and I ain’t moving!

“After I received my MBA, I had to change my name because nobody would employ me.” So a colleague suggested that she try an experiment. “We took everything to do with Arabic out of my resume, changed my name, which was Salam Oueida, just to see what would happen. I kept the “S” so I wouldn’t lose too much of my identity. We decided on ‘Sandra,’ and I got five job interviews right away.” The McFarland name was from her marriage, since dissolved.

Sandra’s parents had Christian Palestinian roots—her mother from Haifa and her father from Nablus. Bombed out of their home in Palestine, the family left by boat to Beirut and then by road to Damascus, where all four children were born. When Sandra, the youngest, was less than two, the family immigrated to Lebanon seeking a better life. Sandra was raised in Beirut where she attended

private missionary schools. “I was very active with the student council and played lots of sports. She learned to play Ping-Pong on her parent’s dining-room table, and was captain and the center of the basketball team. “My basketball heroes were the Harlem Globetrotters.”

At 17, Sandra’s family had to immigrate again because of the civil war in Lebanon, this time to the United States. “Our move to the States felt natural, because my father worked for Bank of America, and I was educated in English rather than French. Schools were all closed and my parents insisted on us . . . getting a college education. Life taught them that education is essential for survival.

“I have had lots of jobs in all kinds of industries.” Sandra started her career with Bechtel Engineering, who sponsored her MBA in finance from Golden Gate University. Sandra’s undergraduate degree is in economics from the University of San Francisco.

“I joined Bechtel as a cost engineer, which is really a cost accountant.” Bechtel was very active in the Middle East, building such big airports as the King Khalid International. As a fun thing to do, I taught situational Arabic for the people who would go to the Middle East; this was my first exposure to my true love — teaching.”

Sandra was later coaxed away by Genentech to help with the scale-up of tPA (tissue plasminogen activator or Activase) production. “That was my first exposure to formal system implementation, which is probably one of my strengths. They hired me to handle their fixed assets system, which was about \$150 million dollars worth of capital investment.” During this stint, Sandra’s son Kyle was born.



With a young child at home, Sandra’s desire to commute waned. She decided to get involved in retail, closer to home, working at the Walnut Creek Nordstrom in the Point of View department. The discount was so attractive that she says she never took any money home. “I turned around and gave it right back to them. I guess that is why they liked me—free labor!”

Soon, Sandra was restless to get back into technology. It was an artificial heart start-up company called Novacore. “Novacore was funded primarily by the NIH, so I got lots of experience with managing a big government-agency award. They didn’t have any systems or any general accounting structure. Again, I ended up implementing general and cost accounting systems. Then, weeks after I was hired, they were acquired by Baxter.” She stayed almost eight years.

During this time, daughter Kellie arrived and Sandra took an offer from Dexter Magnetic Technologies where she got a taste of the electronics industry.

Later, to be closer to home, she landed a job with ADP, the payroll company, which was literally **cont. on page 5**

## OPERATIONS UPDATE

BY HANK GLAUSER

Safety is a critically important issue for everyone at the JGI. It is your responsibility to be safe. I have scheduled time with each group to discuss your safety concerns and to look for areas of improvement. I have started to act on some of your suggestions. Please keep them coming.

Over the past few weeks I have noted some areas where we could all improve. Here are a few suggestions:

Do not block corridors. Main hallways must have a 44-inch clearance maintained per fire codes. If you are stacking empty boxes for pickup in the evening, please stack them so that they are only a couple of feet high and are against the walls.

Please do not block open fire doors. Corridor fire doors provide protection to control the spread of any fire. These doors should remain closed.

Dispose of your hazardous waste properly. We have found fluorescent light tubes, paint cans, aerosol cans, and oil waste in our dumpsters. These are all hazardous waste items and by law must be disposed of properly. Please consult Jimmy Choy if you have questions regarding what constitutes hazardous wastes.

Do not overfill sharps containers. There is a fill line on these containers; please remove the container when it's reached its fill point and replace with a new one.

Business practices are an area where we can avoid unwanted attention. It is extremely important that employees fill out their time cards and that supervisors review and approve these in a timely manner BEFORE the due date. This administrative and supervisory function is getting increased scrutiny

from both LLNL and LBNL. Therefore, Operations and senior JGI management will be closely reviewing compliance with time-card policies.

One constant is change. The new Conference Center will be constructed in Rm. 149 and is planned to have collapsible partitions so that the room can be divided into three separate conference/meeting areas. Currently, we are finding engineering solutions to mitigate the noise, which will make this room more usable as a meeting space.

Additional office space will be provided with smaller projects. One project calls for modifying Rm. 414 after we move out the existing freezers for eight office cubes. The B400 Shipping and Receiving area will be downsized to allow for four offices and one technician area to be built along the north corridor. The Data Center Project currently underway is scheduled for completion in July.

Operations will continue to minimize the disruption as much as possible, but we must continue to work as best we can in pursuit of our mission objectives. Your patience and understanding are needed during these facility construction projects, and are much appreciated.

### JGI CONTINUING COURSEWORK

Advanced Perl Programming:	April 6-8
Intermediate Word:	April 14
Excel Tips & Tricks:	April 28
Advanced Excel:	May 5
HTML 4.0:	May 12
C++:	June 2
Advanced Word:	June 15

Contact Donna McCown ASAP if you're interested in taking any of these courses. (925) 296-5876/mccown3@llnl.gov

## INTEGRATED SAFETY MANAGEMENT

BY JIMMY CHOY

### PRINCIPLES AND FUNCTIONS

LBNL and LLNL have fundamental safety principles that each employee is responsible for knowing. Each employee is responsible for ensuring his or her own safety and promoting a safe, healthful, and environmentally sound workplace and community. Those principles and functions are as follows:

#### PRINCIPLES

1. Line management is responsible for safety (i.e., supervisors)
2. Clear roles and responsibilities (i.e., supervisors and employee relationship)
3. Competence is commensurate with responsibility (i.e., JHQs and EH&S training)
4. Balance priorities (i.e., balancing work and rest)
5. Identification of safety standards and requirements (i.e., LBNL/PUB-3000 Safety Manual)
6. Hazard controls tailored to work being performed (i.e., lab coats, gloves, fume hood, etc.)
7. Operations authorized (i.e., biological use authorization)

#### FUNCTIONS

1. Define scope of work
2. Analyze hazards
3. Develop and implement hazard controls
4. Perform work within controls
5. Provide feedback for continuous improvement

Understanding these principles and functions will help all JGI employees work safely.

## JGI Does LabAutomation 2005

BY MARTIN POLLARD

The annual LabAutomation conference sponsored by the Association for Laboratory Automation was recently held in San Jose during the week of January 30 – February 4, 2005. The conference hosted 4,800 registrants and featured instrumentation vendors from over 200 companies. The conference offered technical short courses in areas such as: Introduction to Laboratory Automation, Design of Experiments, and Nanobiotechnology. The Monday plenary

session hosted a talk with Kary Mullis, 1993 Nobel Prize Winner for Chemistry.

Each year, the ALA LabAutomation conference serves as a technical resource for the JGI and particularly for the Instrumentation Group. Since the end of the human-genome sequencing, the number and type of conferences available have changed dramatically. The LabAutomation conference is the only remaining venue to talk about and see instrumentation relevant to DNA sequencing and sample preparation. In the past, the LabAutomation conference was held in southern California, San Diego and then Palm Springs. The conference moved to San Jose for the past two years. This has presented an opportunity for much of the JGI production staff to at least visit the vendor show to see a variety of equipment they wouldn't otherwise get to see. The vendor show is not only a practical opportunity to research immediate instrumentation needs, but also serves as a valuable educational opportunity to learn about instrumentation. Production lab technicians, managers, and even Operations staff from Finance and Purchasing have

been able to see new developments in instrumentation and competing instruments side-by-side. The timing of the conference is also fortuitous, because this is the time of year we are typically ready to consider changes to JGI equipment inventory, because budgets have been settled and the holidays are behind us. Next year, the LabAutomation conference moves back to sunny and warm Palm Springs.

This year the JGI Instrumentation Group registered Martin Pollard, Simon Roberts, David Humphries, and Steven Wilson. Martin Pollard presented a poster titled "Automation of Fosmid Preps at the Joint Genome Institute." Steven Wilson presented a poster titled "Developing Custom Picking Software Using the Genetix SDK." David Humphries presented a talk called "New Developments in High Performance Magnetic Separation Technology for Laboratory and Industrial Applications." Martin Pollard and Simon Roberts attended a short course, "Introduction to Design of Experiments," and Simon also attended "Introduction to Nanobiotechnology."

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## CSP OUTREACH EFFORTS PAY OFF

The word is out. Thanks to promotional efforts by JGI Director Eddy Rubin, Deputy Director Jim Bristow, and other JGI ambassadors, 135 proposals came through the electronic transom on or before the February 24 deadline for the Community Sequencing Program (CSP). This total represents nearly a 2.5-fold increase from the CSP's inaugural call for proposals in February 2004.

According to Bristow, the proposals represent a diverse array of projects, about half of them microbial along with some 14 large plant and animal genome sequencing requests. A committee of outside reviewers will convene in early April. Their selections will then be considered by JGI's Scientific Advisory Committee (SAC) in May.

In the contest to guess the number of proposals submitted, Anna Ustaszewska came closest to 135 and thus was rewarded with her choice of JGIwear. If you would like to join the JGIwear fashion brigade, contact Carolyn Vertuca at the front desk to place your order.

PHOTO BY DAMON TIGHE

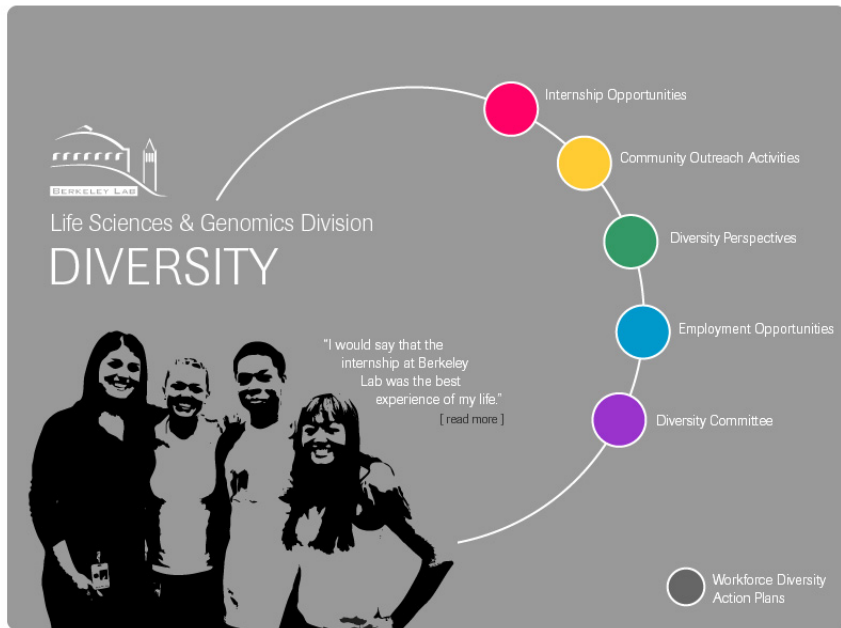


**Congratulations to Sandra Chaparro and Don Miller who were the first to correctly identify the January mystery photo as the zone demarking the safety shower on the Building 100 rear loading dock.**

**Feeling lucky? What and where is this one? Send your answer to [gilbert21@llnl.gov](mailto:gilbert21@llnl.gov)**

The Berkeley Lab Life Sciences & Genomics Division Partner on Diversity Site will raise the visibility of their diversity efforts, the Diversity Committee that spans these Divisions, and the JGI.

<http://www.lbl.gov/Workplace/GD-LS-Diversity/>



## LATEST PRODUCTION GOAL ACHIEVED

JGI Library Support Group Leader Tijana Glavina gave birth to daughter Isabel Lucia on Friday, March 11, at 1:50 pm. She weighed in at seven pounds, five ounces, and was 19 3/4 inches long.

## More Sandra *cont. from page 5*

walking distance from home. “I was looking for software experience. The project I was working on was developing an estimating program for fixing cars.” She worked at ADP for about three years before becoming fed up with a corporate culture that she thought placed a disproportionate emphasis on jacking up the stock price. “I couldn’t stand the conflict between my personal beliefs and what the job demanded from me. So I decided to quit private industry and become a teacher.”

This move bought Sandra more time to be involved in Kyle’s and Kellie’s (now 17 and 13) school activities. “My life revolves around my children. That’s my number-one priority.” Sandra is also

active in her church where she teaches confirmation classes, and takes kids to Mexico and to Washington State on mission trips to help build houses on Indian reservations.

As the dot-com phenom imploded, Sandra got panicky for employment again and pursued an ad for the position at JGI. In a flash, she was on board, in August 2002.

“I really enjoy supporting science in the not-for-profit environment. That’s what really drives me. My job offers me lots of opportunity for success. What I am most proud of is the implementation of the Adios system for material purchase, receipt, and payment. Lots of credit goes to Adi Ray for doing the

development. The system, with the extremely capable group I work with, allowed the JGI to be the first [between LBNL and LLNL] in implementing a supply chain management program.

“I take the responsibility of being a steward for taxpayers’ money very seriously. I strive to live up to that trust. Also, personally, I believe that we humans are stewards of the environment. The earth is only lent to us so we can keep it for the next generations. The JGI’s commitment to the environment, health, and safety is aligned with my personal beliefs, which makes my employment here a natural fit.

“Come by for some coffee if you’d like to chat, with or without surprise.”

## Marine Community Ecogenomics and Dodging Hurricanes in the Caribbean

BY ASTRID TERRY

Coral reefs are among the most beautiful and productive ecosystems on earth. Their existence depends upon an intimate symbiotic relationship between corals (animals) and photosynthetic dinoflagellates (zooxanthellae) that live inside the coral cells. The symbionts produce sugars and other compounds that feed the host, and in return, the coral host bathes the symbionts in rich fertilizers that enhance their growth. This merger allows corals to live in warm tropical oceans, which would otherwise not contain sufficient nutrients to support high levels of animal growth.



**Mónica Medina checking out conditions during the day for collecting spawn at night. Hurricane conditions make the water murky.**

As a result, the multishaped coral skeletons provide the three-dimensional structure in which shallow tropical marine communities thrive. Coral health is highly

dependant on the tight relationship between the corals and their photosynthetic symbionts. Loss of the algal symbionts (coral bleaching) is a widespread phenomenon correlated with changes in environmental factors such as ultraviolet radiation, salinity, and temperature. Disruption of the coral-zooxanthellae symbiosis can have fatal consequences for the host; thus coral survival is highly correlated with a stable symbiotic relationship. Global warming has impacted coral reefs worldwide by causing the disruption of symbiosis and the degradation of the reef ecosystem.

When corals reproduce, most species produce eggs without zooxanthellae. The independent **cont. on page 10**

## PILATES, JGI STYLE

BY WENDY SCHACKWITZ

What do the San Francisco 49ers and Catherine Zeta-Jones have in common? They all have hard bodies from practicing Pilates. Pilates was invented by Joseph Pilates in the late 1800s to rehabilitate hospital patients. When he immigrated to New York in the early 1900s, word got out to Martha Graham and George Balanchine, and he began working with their dancers. Recently, Pilates has been rediscovered by sports rehabilitation clinics, athletic programs, models, and actors.

So why is Pilates so popular? It is a fun exercise program that focuses on strengthening your core and increasing your flexibility. This is ideal for combating repetitive stress issues



**Pilates instructor and JGI researcher Wendy Schackwitz and Anna Ustaszewska kick up their heels at a recent session.**

and giving your body a much-needed break. So step away from your PC and your Pipetman and come join me and the new "Pilates at the JGI" club for a class. The club is open to all lab employees, at all levels of fitness, at no charge. All you need to participate is comfortable clothing, a Pilates mat, and

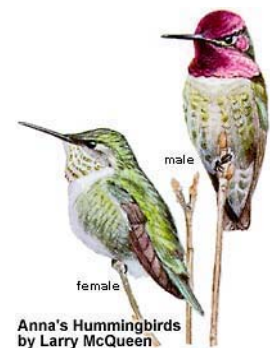
your enthusiasm. Pilates mats are thicker than the typical Yoga mat, and the extra cushion will be important when exercising on the hard conference floor. If you do not already have a mat, you can purchase one from me for \$30, or you can ask me for suggestions on where you can purchase one.

The class will be held Tuesday and Thursday evenings from 5 pm–6 pm and Wednesday and Friday mornings from 7 am–8 am in the 149 conference room. Feel free to drop in whenever you have time in your schedule, but please try to let me know if you plan to attend so I can have enough equipment on hand. If you have any questions, contact me at [wsschackwitz@lbl.gov](mailto:wsschackwitz@lbl.gov) or X5634. I look forward to seeing you!

## BIRDS OF JGI

BY WENDY SCHACKWITZ

Many of our JGI colleagues are skilled photographers and have stunning pictures of our feathered friends. I encourage you to send me your photos for species identification, as well as potential inclusion in a future edition of *The Primer*. In this issue, we feature a picture of an Anna's Hummingbird taken by Frank Korzeniewski.



Anna's is the most common hummingbird around Walnut Creek, and is the only one that is here year-round. These tiny birds are very aggressive, and will spend much of their time chasing other hummingbirds. At the JGI-PGF, you can watch them madly chase each other between buildings 100 and 400. The male Anna's can be distinguished from other hummingbirds by its iridescent red head, green body, and relatively short and straight bill. Female hummingbirds are quite difficult to identify as they all look very similar. Male Anna's hummingbirds will do elaborate dive displays. They start by hovering in front of another hummingbird and then climb to 130 feet before plummeting back down. At the bottom of the dive you can hear the bird give a little "bark."

Did you know that hummingbirds...

Get their name from the humming that is produced by the sound of their wings beating?

Have hearts that beat about 250 times per minute while at rest, and about 1,220 per minute while flying?

Beat their wings about 60–80 times per second in normal flight, and up to 200 times per second in courtship dives?

Weigh only about 3 grams?

Eat their weight in nectar or sugar water each day?

Can live over 10 years?

Anna's Hummingbirds are readily attracted to feeders. If you would like to attract hummingbirds to your backyard, all you need is a hummingbird feeder and some nectar. To make nectar, take white sugar and mix 1 part sugar to 4 parts water. Bring this to a boil to dissolve the sugar and sterilize the nectar.

## SOME DOS AND DON'TS:

- Do replace the nectar frequently to avoid spoilage. Every few days in warm weather and once a week in cool weather is recommended. If the nectar looks cloudy, it needs to be replaced.
- Do clean the feeder regularly with hot water and maybe a little vinegar and/or bleach to keep it sanitary. Do not use detergent, as it can leave a residue.

- Don't use honey when making the nectar, because it rapidly ferments and cultures a bacterium and fungus that are deadly to hummingbirds.
- Don't use artificial sweeteners. This has no nutritional value, and the birds can starve.
- Don't add red dye; some types of dye might be harmful.

Yellow jackets can be a problem at your feeder, as they also like to snack on the nectar. Some solutions are to purchase a feeder that has bee guards and to make sure there is no sugar on the outside of your feeder by occasionally rinsing the outside. Also avoid feeders that have any yellow on them, as this color attracts yellow jackets. If you still have a problem, you can try diluting your nectar to 1 part water and 5 parts sugar. This mixture appears to be less inviting to the yellow jackets, yet the hummingbirds still love it.

To find out more about our hummingbirds visit: [http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/Annas\\_Hummingbird.html](http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/Annas_Hummingbird.html)

## JGI Bolsters Senior Management Team

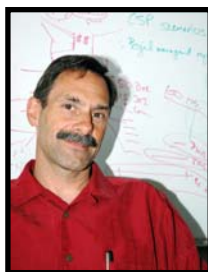
Please welcome two “new” members to the JGI senior management team: Darren Platt, who has joined JGI as the Informatics Department Head; and Jim Bristow, who has been serving as the Interim Deputy Director of Programs and has now accepted that position.



Darren is matrixed through LLNL's Computing Applications and Research Department and will report to Peg Folta. Darren completed his Ph.D. in Computer Science at Monash

University, Australia, in the field of genome-wide restriction mapping. In 1995, he moved to the Sanger Centre, Cambridge, where his postdoctoral research focused on image processing for both DNA sequencing and mapping applications. He joined the computational biology group at Exelixis in 1997 as a founding member of the group. Over the last seven years he has worked along all stages of the research pipeline for pharmaceutical and agricul-

tural products. This covered the initial acquisition of the *Drosophila* (fruit fly) proteome, through comparative genomics, and integration of clinical and research literature.



Jim Bristow is a former pediatric cardiologist with 15 years' experience in clinical practice and laboratory investigation of the molecular genetics of connective tissue

disorders and congenital heart disease. He joined the Genomics Division at LBNL in January 2004 as Deputy Director and assumed major responsibility for the Community Sequencing Program (CSP). As Deputy Director for Programs at JGI, Jim will continue to manage the CSP while pursuing an interest in human congenital malformations through high-throughput sequencing of candidate genes with Len Pennacchio, and developing a clinical microbiology focus integrated with the Microbial Ecology Group led by Phil Hugenholtz.

## JGI New Employees

**IAIN ANDERSON**

*Biologist Scientist in the Microbial Genome Analysis Program Department under the supervision of Nikos Krypides*

**KECIA DUFFY-WEI**

*Software Developer 3 in the Instrumentation Group under the supervision of Martin Pollard*

**KARLA IKEDA**

*Laboratory Technician in the Production Library Support Group under the supervision of Tijana Glavina*

**JAYADEVI (JAYA)**

**KRISHNAKUMAR**

*Sr. Research Technician in the Production Library Support Group under the supervision of Tijana Glavina*

**LINH TRAN**

*Scientific Technician in the Production Library Support Group under the supervision of Tijana Glavina*

**FALK WARNECK**

*Computational Biologist Postdoc Fellow in the Microbial Ecology Program Group under the supervision of Phil Hugenholtz*

## AWARDS AND ACCOLADES



**Jeremy Brand, Aaron Porter, Brian Yumae, and Matt Dunford** (from left to right) received a SPOT award for their participation on the Authority to Operate (ATO) team. Last year, the Office of Management and Budget changed the requirements to obtain an ATO governing operations of JGI's computer systems. In response, the team stepped up and implemented the required

new security measures, managing to compress a massive effort into a brief period through extraordinary cooperation and teamwork.



## A BETTER WORLD THROUGH BOOKS

Researchers at several scientific institutions are partnering with researchers at the DOE Joint Genome Institute and the national laboratories to facilitate research in developing countries of the Old World (approximately 40 countries). Among the most notable is Dr. Kraig Adler from Cornell University and the Society for the Study of Amphibians and Reptiles who donated several thousand dollars of new texts and journals targeted for Iraq and Afghanistan. On February 11, 2005, 450 pounds of books were shipped to Iraqi Kurdistan via USAID. In response, Salahaddin University in Erbil, Iraq, is setting up a new biology library.

At the time of publication, Dr. Jonathan Losos of Washington University in St. Louis shipped 606 pounds of books to JGI for distribution to Salahaddin University. In addition, at least another several hundred pounds of high-quality books are ready for shipment to USAID for distribution to the university.

This is a very exciting outcome, and I invite anyone to join in our effort. We seek books, anything educational or dic-



**Bob Macey and books bound for Iraq.**

tionaries, in any language. Please leave your donation at one of our drop-boxes, or send donations to:

J. ROBERT MACEY, PH.D.  
*Department of Evolutionary Genomics  
 DOE Joint Genome Institute and  
 Lawrence Berkeley National Laboratory  
 2800 Mitchell Drive Building 400  
 Walnut Creek, CA 94598-1631  
 jrmacey@lbl.gov*

## JGI FLIES SOUTH



PHOTO BY ALLA LAPIDUS

Marco Island, Florida, was once again the site of the 2005 joint venue for the Advances in Genome Biology and Techno-

logy/Automation in Mapping and Sequencing (AGBT/AMS) meeting. This year's meeting emphasized applied genomics and bioengineering as major areas of focus. Alla Lapidus was among the JGI participants. She presented on the DOE Microbial Genome Program (<http://microbialgenome.org>) founded in 1994. A principal goal of the program is to determine the complete genome sequence of a number of microbes that might be useful to DOE in carrying out its missions. The JGI is responsible for sequencing, assembling, finishing, and annotating microbial genomes through the MGP and other programs. To date, the JGI has sequenced over 100 microbes to draft quality, finished over 30, and is currently working on more than 60 additional microbial projects.

PHOTO BY DAMON TIGHE



## Make a Date with the EAC

One hundred shamrock shakes were whipped up by JGI Employee Activities Committee (EAC) volunteers for the St. Paddy's celebration, with the proceeds going to support future EAC events.

Here is an exciting roster of events planned for the coming months.

**Tax Day Blues BBQ** (the first JGI EAC BBQ of the season), Friday, April 15th

**JGI EAC Plant Sale**, Friday, April 28th (note new date). Donate your potted seedlings to raise money for the JGI

Summer Picnic (for details, contact Wendy Schackwitz: [wsschackwitz@lbl.gov](mailto:wsschackwitz@lbl.gov)).

**El Cinco De Mayo Fiesta** (May 5th)

**JGI Yard Sale** (date: TBD)

**JGI Summer Picnic** (date: TBD)

Join the EAC and lend a hand on letting the good times roll. Contact Carolyn Vertuca ([vertuca1@lbl.gov](mailto:vertuca1@lbl.gov)) for the dates and times of the next EAC meeting (typically Mondays at noon in the 149 conference room).

## Caribbean Ecogenomics cont. from page 6

zooxanthellae (aka dinoflagellates) can be cultured in the lab, in nutrient-enriched seawater. The nonsymbiotic corals can then be introduced to cultured dinoflagellates, and the symbiosis is established. This provides a perfect model system with which to study the development of symbiosis.

Mónica Medina (JGI scientist) and Jodi Schwarz (JGI postdoctoral fellow) are trying to find the structure, interactions, and relationships between coral and their diverse communities of photosynthetic dinoflagellate symbionts (zooxanthellae) and to use their data for comparative analysis with closely related genomes in terms of life cycle and genome evolution, and as a general resource for improved genome annotation (i.e., the cnidarians, Starlet sea anemone, *Nematostella vectensis* and the chromalveolate alga *Emiliana huxleyi*, both being sequenced at the JGI, and *Hydra magnipapillata*, which is being sequenced by NHGRI). To study this system, they must work with the animals underwater, in their natural environment, because mature corals are almost impossible to rear in the laboratory. This means SCUBA diving to collect samples!

The main field sites are in the Florida Keys at the Keys Marine Lab on Long Key and the UNC remote marine field station on Key Largo. There are other sites around the Caribbean in Puerto Rico and the U.S. Virgin Islands. The field season takes place in the summer months of August and September. At a very specific time during just one or two summer months (two to three days after the full moon, between 10 and midnight), in the luminescent dark, all the corals spawn at once. In a spectacular display, thousands of coral heads release thousands of egg/sperm bundles that rise gently towards the water surface, where they will break apart, and

disperse on the waves to fertilize and develop into the next generation of corals.

Every year a group from JGI (including scientists Mónica and Jodi, and technicians and divers Jeff Froula and Astrid Terry) goes to set up experiments during this exciting time. To collect samples, our intrepid team travels on boats, out into the reef, where divers place fine floating nets around the coral boulders to collect the packets of eggs and



**Jodi Schwarz trying to find equipment for an experiment during mandatory evacuations**

sperm as they are released. Eggs are fertilized with sperm from different sites, and the developing embryos are transported back to the marine lab. The larvae that develop are reared in the lab until they develop the ability to take up their symbionts. The researchers then freeze each partner at representative stages of the symbiosis. Back at the JGI, RNA is isolated from each partner at different stages and packaged into cDNA libraries to create a comprehensive collection of genes that are expressed. The cDNA libraries are sequenced along with selected whole genome Bacterial Artificial Chromosome (BAC) libraries for *Montastraea faveolata*, *Acropora palmata* (two major reef-building corals of the Caribbean), and the dinoflagellate sym-

bionts *Symbiodinium* sp. for the Evolutionary Genomics Group.

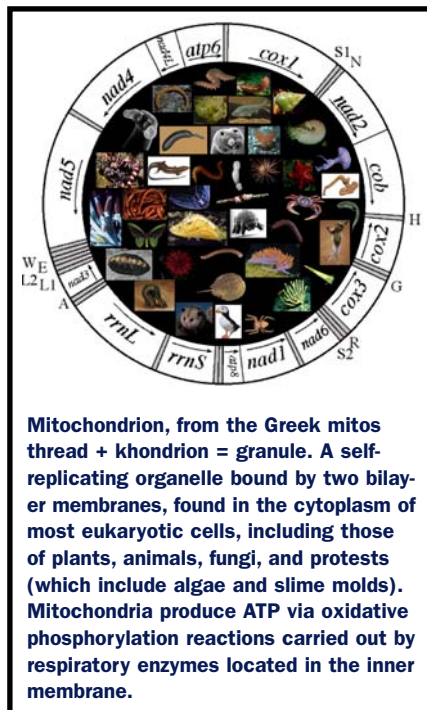
During this last field season, efforts to collect samples were hampered severely by several large hurricanes that battered Florida and the Caribbean. First, the category 4 Hurricane Charley pounded the Florida coast, making it difficult for the boats to get out to the reefs. Once deployed, the rough seas made collecting hazardous; however, a small lull in the weather allowed them to zip in and collect the first coral *Acropora* spawn. Back in the lab, the team then spent an exhausting 4 weeks raising the larvae, performing experiments, and packing/moving/unpacking due to mandatory evacuations. As the next spawning window approached, category 2 Hurricane Frances was stomping across Florida, and Ivan (category 5) was threatening the Caribbean. Contingency plans were made; depending on the path of the hurricanes, someone would have to fly to one of the other field sites to collect spawn if the main sites were still closed due to dangerous conditions (unless the planes were grounded also because of excessive wind). Eventually, Jodi bravely flew, into the path of oncoming Ivan, to Puerto Rico where a collaborator had collected some *Montastraea* spawn during the first night of spawning. This was the only chance they had to get tissue! Jodi was deplaned and escorted to pick up the tissue, filled out customs forms, and got back on the plane to avoid Ivan. Talk about celebrity status and VIP treatment! Too bad it only lasted eight minutes.

Safely back in California, tucked away in the lab, science develops apace. Mónica and Jodi have their first sequence from their cDNA libraries, and results from microarray experiments. Who knows what the future holds? Hopefully friendlier skies next field season.

## HOW MUCH DO YOU KNOW ABOUT Your Other DNA?

BY J. ROBERT MACEY

1. Would a mutation in your chromosomal DNA do more damage than a mitochondrial DNA mutation?  
 Yes  No
2. Do point mutations in mitochondrial transfer RNAs cause problems?  
 Yes  No  
If so, how many such point mutations will trigger them?  
(A) one (B) two  
(C) three (D) four  
(E) five (F) most
3. Does your father have the same mitochondrial genome as you do, or is it a mixture with his mitochondrial DNA?  
 Yes  No
4. Is there one of the 37 mitochondrial genes that you can do without?  
 Yes  No  
If so, which one(s)?
5. In a trial, is mitochondrial DNA definitive evidence you were at the scene of the crime?  
 Yes  No  
(A) If you answered "Yes," is it absolutely implicating?  
(B) If you answered "No," is it absolutely exclusive?
6. Is the order of the 37 mitochondrial genes the same among humans, *Xenopus*, and Rock Cod?  
 Yes  No
7. Do lizards and snakes deviate from the gene order observed in



**Mitochondrion, from the Greek *mitos* thread + *khondrion* = granule. A self-replicating organelle bound by two bilayer membranes, found in the cytoplasm of most eukaryotic cells, including those of plants, animals, fungi, and protists (which include algae and slime molds). Mitochondria produce ATP via oxidative phosphorylation reactions carried out by respiratory enzymes located in the inner membrane.**

- humans more than five times?  
 Yes  No
  8. Given that birds are reptiles, and the sister lineage to crocodiles and alligators, do they share the same order of the 37 mitochondrial genes?  
 Yes  No
  9. Do snails have the same 37 mitochondrial genes as humans?  
 Yes  No
  10. Would you completely trade your 37 mitochondrial genes for 500 new gene versions that could help your overall welfare in the nuclear genome, given you could select them?  
 Yes  No  
Why, why not...discuss.
- See the next issue of *The Primer* for answers.

### JGI SEMINAR CALENDAR

These meetings are held at LBNL, Building 66 Auditorium from 4:00-5:00 pm (except April 5). See below.

**April 5: Robin Allshire, University of Edinburgh** "RNA Interference, Silent Chromatin and Centromere Architecture" 11:00 am

**April 12: John Sedivy, Brown University** "Effectors of Senescent States in Human Cells"

**April 19: Michael Jordan, UC Berkeley** "Phylogenies, Functional Annotations, and Haplotypes"

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### LBLN LIFE SCIENCES AND GENOMICS DIVISIONS SEMINAR CALENDAR

These meetings are held at LLNL, Building 361 Auditorium.

**April 7: Dr. Brett Chromy, Defense Biology Division** Defense Biology Division Development Seminar

**April 14: Dr. Erik Draeger, LLNL** TBA

**April 21: Dr. Ed Lau, Health Biology Department** TBA

**April 28: Dr. Larry Thompson, Health Biology Department** Health Biology Division Special Seminar

**May 5: Dr. Chitra Monohar, Health Biology Division** Biotechnology Division Development Seminar

**May 12: Dr. Steven Kazmirski, UC Berkeley** TBA

**May 19: Ann Holtz, Defense Biology Division** TBA

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www.llnl.gov/bio/calendar

## JGI Connects with Mt. Diablo Unified School District for Festive 'All About DNA' Day

Eighty lucky seventh-grade students from Concord, California, Glenbrook Middle School got a head start on spring break, appropriately enough on the first day of spring, when JGI joined forces with Mt. Diablo Unified School District for a fun-filled "All About DNA Day."

From 9 am to 2 pm, the students negotiated the maze of the Willow Creek Center to experience a broad spectrum of hands-on DNA exercises, guided by Glenbrook educator and part-time rock star Randy Monroe, who happens to be lead man for a Van Halen tribute band called "Hot For Teacher" (<http://www.hfrocks.com/>).

"All About DNA Day" was designed by researchers and support staff from the JGI and Lawrence Berkeley National Laboratory, and coordinated by Clayton Valley High School biology teacher Karen Kelly and a dozen of her students, along with Berkeley Lab Genomics Division's Elaine Gong. Other volunteers included JGI's Mariana Anaya, Eileen Dalin, Annette Greiner, Wendell Hom, Amber Nivens, Damon Tighe, and Kristen Taylor, as well as Genomics Division's Veena Afzal and Ingrid Plajzer-Frick.

The event was organized into seven concurrent sessions:

1. Extracting DNA from Fruit
2. Building a Giant DNA Model
3. DNA Gel Electrophoresis
4. Identifying Mystery "Critters" by DNA Sequence
5. Predicting Susceptibility to Sickle Cell Anemia
6. Making a Transgenic Mouse
7. Powers of Ten

"In the 'Power of Ten' exercise, the kids got to see both the very large and the very small," said Kristen Taylor. "It was fun to see them switching gears and start considering that maybe the tiny things, like DNA and quarks, could



*Clockwise from upper left: Eileen promotes pipette prowess; Glenbrook bioethicist-in-training dazzles with DNA; pipetting roundtable; Ingrid helps a student "gown-up" for some simulated transgenics; sharing the joy of discovery; Mariana gives some pipetting pointers.*

also be interesting."

The event was covered by the *Contra Costa Times* (<http://www.contracostatimes.com/mld/cctimes/email/news/11199375.htm>).

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