

The JGI *Primer* Hits the “Press”

JGI, approaching its eighth year of existence and its sixth of operation at the Production Genomics Facility (PGF) in Walnut Creek, continues to grow—in staff, space requirements and the positive impact our sequencing and science are having on the scientific community. As our influence and distance between our workstations expands, there emerges a need to keep our team better informed and to cultivate an environment that recognizes our meaningful contributions to this growing concern, hence the creation of The JGI Primer.

First, our thanks go to Damon Tighe for the winning submission of the newsletter’s appropriate moniker. Second, in order to make The JGI Primer timely, informative and interesting, we need to have your voice reflected in these pages. So, we need your help. I have great confidence that in our midst we have writers and artists just yearning for an outlet. Let these pages be your palette. Please send me your suggestions and submissions—calendar items, columns, images, tantalizing tidbits and the like—for this monthly work-

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in-progress. I look forward to working together to keep the information flowing.

To be continued . . .

David Gilbert, The JGI Primer editor

JGI DIRECTOR’S CORNER:

A Call to (Disembodied) Arms



On the occasion of the maiden voyage of our newsletter, The JGI Primer, I would like to share with

you my enthusiasm for my favorite holiday, Halloween. For me and my lab, Halloween has always served as an occasion to bring us together for some big fun.

Accordingly, on Friday, October 29th, we will convert our hallowed hallways here at the JGI Production Sequencing Facility to a pirate ghost ship—and assemble ourselves in ghoulishly appropriate costumes. I

encourage all to bring young trick or treaters to the JGI festivities.

My benchmark for a successful Halloween affair is to see whether I can scare my son. This gets to be a much more difficult proposition every year (and especially now that he is a teenager), but I am determined to do it again this year. I hope that you’ll all pitch in and make this a terrifyingly fun JGI Halloween.

In the same way that Halloween brings out the energy and creativity in many of us each year, I hope The JGI Primer will do the same and help us get to know each other a little bit better every month.

Yo-ho-ho!
Eddy

JGI Microbial Program Revamp

Following the JGI partners meeting on October 8th, a new structure for the JGI Microbial Program has begun to take shape. During this meeting, Paul Richardson, who will direct this program, reviewed past successes of the microbial program and outlined the structure for moving forward. The goal is to extend the benefits through better coordination among JGI partners.

David Bruce from JGI-LANL will assume the project management helm. This fulltime scientific/administrative position will track progress of all projects and will report back to management and collaborators. This role will also entail everything from designing the process model, contacting collaborators, receiving DNA and describing the scope of work in user agreements for each project. Among the goals for 2005 will be to add an additional 40-60 projects.

Alla Lapidus will head up the microbial

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Stanman's Need for Speed

BY DAVID GILBERT

A gearhead from birth, Greg Stanley by age five was already taking off the wheels of his toy John Deere pedal tractor. "I was seven when my Dad started teaching me how to drive out on the country roads of Nebraska—a Chevy pickup with a big steering wheel and a four-speed. I played Tarzan swinging on the steering wheel because I wasn't tall enough to sit on the seat and reach the pedals. So I would steer and tip-toe the gas and jump down on the clutch pedal and shift."

A few years later he witnessed his first drag race at the Summer Nationals in Kansas City. "I got to meet 'Big Daddy' Don Garlits, Shirley Muldowney and a bunch of other legendary racers. That was a hook, big time."

Over the ensuing decades, Greg's toys have gotten more sophisticated, expensive, and a lot faster. When he isn't keeping the JGI facilities humming, he is fine-tuning his passion, his own 800+ horsepower dragster.

In his fifth year officially with JGI, Greg honed his mechanical skills for over ten years serving in the U.S. Navy as a nuclear power mechanical systems engineer, below the seas on the submarine USS James Monroe and above on the sub tender USS Frank Cable.

"People talk about stressful situations. They don't know what real stress is. Try a fire on a submarine, four hundred feet underwater. That's some stress."

Out of the Navy, Greg worked for an environmental services company as a field supervisor, a latter day Red Adair. "Like John Wayne in Hellfighters, we'd go in by one means or another and repair the leak so they could continue operating."

In whatever time he could get off,

Greg gravitated to the only thing that he has ever been passionate about, drag racing. In 1997, he bought a welder and 300 pounds of chrome-molybdenum tubing and he was off to the races, building his first real racecar, a replica of a Chevy



S10 Pro Stock truck.

Greg eventually sold his S10 and graduated to his current ride, a 230-inch wheel base dragster. "It's a toothpick with a motor," Greg says. The aluminum body features a tribal "S" script on the topside, for his nickname, "Stanman."

Greg's most harrowing moment came April Fool's weekend at the Summit-Racing.com Nationals in Las Vegas. It was no joke for Stanman. Rain caused delays that forced the first round of competition late into the night. "The track was really cold. Dew was starting to set in. I beat the guy I was racing off the starting line, but as we got to the finish line, I got on the brake a little hard and the car proceeded to turn



sideways on me at about 167 miles per hour and started heading into my competitor's lane. Luckily, he was already past me at that point. My car slid sideways on me and I corrected into it. As it snapped back I corrected again and it got up on two wheels for just a second. I was just thinking, 'don't go over.' With a lot of luck and not over-correcting, I kept from crashing. With margins of victory often being less than one thousandth of a second, the least little mistake and it's done and you've lost."

Although not quite in the elite of racing, where top fuel dragsters can run the quarter mile in less than four and a half seconds at over 335 mile an hour, Stanley's dragster is no slouch, traversing the quarter-mile in 7.6 seconds at 176 miles an hour. "A lot of people hear those numbers and say 'wow, that's pretty fast,' but they don't realize just how fast until you put it in terms that they can relate to. Most streetcars will go zero to 60 somewhere between seven and ten seconds. Get into your average Corvette and it's like five seconds. My dragster will go zero to 60 in one second."

JGI SOFTBALL—Walking Wounded Finish Successful Season

BY CHRISTOPHER HACK

The black and blue colors on next year's JGI softball t-shirts will reflect the efforts, and the bruises, of the players in the team's inaugural season.

The JGI fielded its first-ever city league softball team in June, as fifteen lab employees (with frequent contributions from significant others and friends) descended upon the Orinda Adult Co-Ed Softball League, all becoming honorary residents of the City of Orinda in the process. At times, the upstart expansion team, dubbed the Gnomes (with an optionally silent 'G') felt like the Tampa Bay Devil Rays going up against such storied Yankee-esque franchises as Meadow View (so-called because the whole team lives on Meadow View Street in Orinda), the Alphas (all wearing shirts sporting Omega logos), and AWOL (all of whom have been in the league for at least the last fourteen years). Yet the Gnomes were able to hold their own, finishing 6th in the 11-team league with a 4-5 record and meriting a playoff berth. A loss to eventual league champion Meadow View in the first round of the playoffs capped the season on August 14.

But the real story of the team was how much ink was used in making additions to the team's Disabled List. A bad omen foreshadowed the entire season when three Gnomes (P-OF Chris Detter, IF James Thiel, and P-IF Phil Bach) man-



The author and intrepid JGI hurler, outstanding in his field.

aged to procure or exacerbate hand injuries at the very first practice. From there, the roster of rehabbers only grew, with every member of the team being injured at least once, from the minor (C-OF Nicola Robb trying to catch a ball with her wrist rather than her glove) to the moderate (IF-OF Susan Lucas tak-



JGI free-swinger.

ing a one-hop throw off her face) to the severe (IF Danielle Mihalkanin surviving a collision with a baserunner twice her size and taking away sprained quadriceps for her troubles) to the ridiculously stupid (P-IF Christopher Hack discovering that he had a torn ACL by foolishly trying to run the bases after a previous injury).

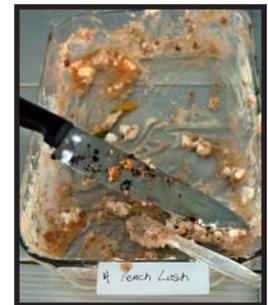
Injuries and mayhem aside, a good time and a lot of pizza and beer were had by all. Everyone is taking time off to rest and recuperate, and all look forward to getting back on the field next season!

JGI PICNIC SWEET MEMORIES



Terrence and Angel, the Brothers Perrier.

Over 120 JGI staff and their families gathered on August 5th in the verdant and expansive Pleasant Hill Park for the First Annual JGI Picnic—an afternoon of festivities including a repast of barbecued tri-tip, sausages and corn, and activities ranging from basketball to softball. A dessert contest organized by Marcia McGowan got the masses salivating by ushering up a wide array of delectables. First prize went to Danielle Milhalkanin for her Peach Lush, for which she was awarded a \$25 gift certificate to Applebees. Cathy Olsen (Jason Baumohl) won second prize (a \$15 Barnes and Noble gift certificate) for her Double-Helix Mousse Cake. Ofelia Cardenas (Lolo Cardenas) took third place for her Chocolate Flan. Look for the recipes in the upcoming JGI Holiday Cookbook. The Building 100 crew emerged as the victors in the softball summit against Building 400. Casualties were non-lethal.



The winning dessert entry—Peach Lush—it must have been good!

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JGI Staff Joins China's International Zoology Congress

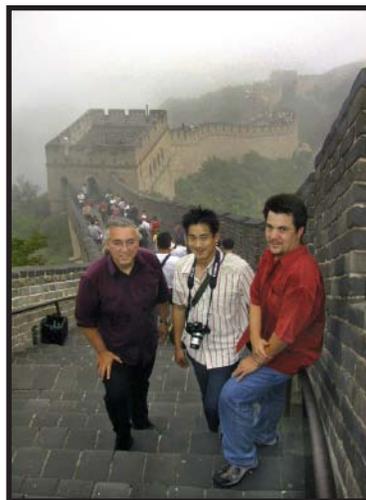
BY BOB MACEY

Jeff Boore (pictured, left), head of the Evolutionary Genomics Department, at the invitation of the Chinese Academy of Science, led a delegation of JGI researchers to China for the International Congress of Zoology in August. Jim Parham (right), an NSF-JGI postdoctoral researcher, and Jon Fong (middle), a U.C. Berkeley-JGI graduate student, accompanied Jeff on the trip.

Professor Wen-Ying Yin, a senior member of the Chinese Academy of Sciences, invited Jeff to give a lecture at the Arthropod Phylogeny Symposium. This presentation covered several revolutionary advances in understanding the evolution of this diverse phylum (including insects, lobsters, scorpions, horseshoe crabs, and other animals) that have come in recent years from sequencing and comparing complete mitochondrial genomes at the JGI. These studies have led to radically different views of adaptations to life on land, patterns of change in animal body plans, and vari-

ous aspects of genome evolution.

Jim and Jon attended the Symposium on Ecology and Conservation of Asia's Freshwater Turtles and Tortoises, organized by Shi Haitao (Hainan Normal University, China) and John Thorbjarnarson (Wildlife Conservation Society, USA). Jim gave a presentation on "The role of molecular systematics in the conservation of Asia's threatened turtles." The talk highlighted ongoing collaborative research, including the use of molecular methods to identify and prioritize turtles for conservation, as well as the use of ancient DNA techniques to amplify sequences from old museum specimens (including extinct species). Some of this research was profiled in *Nature* (2003, 423:219-220).



Jon's most memorable moment was the discovery of only the fifth known specimen of the Shanghai Softshell Turtle in the Beijing Zoo, which had been misidentified. This is China's largest softshell turtle, unfortunately on the brink of extinction. Talk at the meeting was initiated to bring the 5 known living individuals together for breeding.

The Evolutionary Genomics Department has had an 18-year collaborative history with Chinese scientists. Besides the field research efforts of Jim Parham and Jon Fong in southern China, Bob Macey has worked extensively in China and Tibet. Collectively, the department houses an immense Chinese genetic resource collection that is a current collaborative target for departmental sequencing effort.

CRITTERS IN THE QUEUE

Branchiostoma floridae (Florida lancelet)



Daphnia pulex (water flea)



*Emiliana huxleyi**
(marine coccolith)

Nematostella vectensis (burrowing anemone)

Phakopsora pachyrhizi (soybean rust pathogen)

Volvox carteri (a spheroidal green alga)

Xenopus tropicalis (western clawed frog)

Zea mays (corn)

RECENT JGI SELECTED PUBLICATIONS

"Finishing the euchromatic sequence of the human genome," International Human Genome Sequencing Consortium, *Nature* **431**, 931-945 (21 October)

"Megabase deletions of gene deserts result in viable mice," M. Nobrega, et al., *Nature* **431**, 988-993 (21 October)

"The Genome of the Diatom *Thalassiosira Pseudonana*: Ecology, Evolution, and Metabolism," E. Ambrust, et al., *Science*, Vol 306, Issue 5693, 79-86 (1 October)

"The DNA sequence and comparative analysis of human chromosome 5," September 15, J. Schmutz, et al., *Nature* **431**, 268-274 (16 September)

"Complete mitochondrial genome sequence of *Urechis caupo*, a representative of the phylum Echiura," J. Boore, *BMC Genomics* 5: **67** (15 September)

"Morphological homoplasy, life history evolution, and historical biogeography of plethodontid salamanders: Novel insights from complete mitochondrial genome sequences," R. Mueller, et al., *PNAS USA* **101**(38): 13820-13825 (13 September)

"Reverse Methanogenesis: Testing the Hypothesis with Environmental Genomics," September 3, S. Hallam, et al., *Science*, Vol 305, Issue 5689, 1457-1462 (3 September)

*image courtesy of Markus Geisen

JGI OUTREACH

JGI Mentors Valley Girls

JGI staff hit the road on Saturday, October 2 to participate in the Twelfth Annual San Joaquin County Expanding Your Horizons in Science and Mathematics Conference at the University of the Pacific in Stockton.

The event was designed to expose hundreds of Central Valley girls and young women from grades 6 through 12 to a diverse range of challenging career options, from high technology to engineering to public safety, with a particular emphasis on science and mathematics. Over the course of the day, participants experi-



Sanna Anwar (far left) pitched in to capture the imagination of the next generation of scientists!

JGI Demonstrates What's Next

JGI in partnership with Livermore and Berkeley Lab colleagues helped hundreds of Chicagoland youth learn the art of DNA extraction during the DOE-sponsored "What's Next" science education celebration October 14 at Chicago's venerable Navy Pier.

enced hands-on workshops where they met people who were in a position to have an early impact on the choices they make about their future.

The JGI team, comprised of Sanna Anwar, Dan Baker, David Gilbert, Catherine Gordon, Karen Kelly, Amber Nivens, and Susannah Tringe, offered a three-part session, repeated throughout the day. Featured were such techniques as pipetting and agarose gel electrophoresis, DNA structure model assembly, and a novel bead-based genome sequencing exercise.

This conference was sponsored by the University of the Pacific School of Engineering, Lawrence Livermore National Laboratory and Sandia National Laboratory.

JGI Walks for JDRF

JGI staffer Sharon Ropes (right) and son Brad joined the JGI Team on the Sunday, October 3, Juvenile Diabetes Research Foundation (JDRF) fundraising walk at Heather Farms in Walnut Creek. Along with Laura and Grant Johnson, Wendell Hom, and David Gilbert, the JGI Team raised nearly \$1400 for research. Thanks to our colleagues at JGI and their family and friends, these donations enabled JGI's contribution to account for over one third of the University of California's team effort.



JGI Recycles

The launch of *The JGI Primer* also marks the launch of a new campaign to increase recycling and recycling awareness here at JGI/PGF. Efforts by Contra Costa County have made it significantly easier to recycle;



now, all recyclable materials can be collected in one container. This includes all paper products, cardboard, plastic, glass, tin, steel, and aluminum. This means that all the recycling containers around JGI can accept all these items. As many of you may have noticed, these containers

have been labeled with a new "JGI Recycles" logo and a list of the allowable materials. Please use these receptacles for all your recycling needs. Aluminum cans, however, are still being collected by the JGI Employee Activities Committee (EAC) in the large blue bins in the lunchrooms. Direct your comments to your self-appointed JGI Recycling Coordinators Duane Kubischta and Damon Tighe.

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BRASH BASH RISES TO JGI CHILI CHALLENGE

Harry Bash went it alone this time and just beat out runner-up Brent Sanders for the top honors in the First Annual JGI Chili Challenge, held October 21st under cloudless skies out on the patio between Buildings 100 and 400. Harry was in top form at this JGI Employee Activities Committee (EAC) sponsored event, scoring high marks from the judges: Sandra McFarland of JGI Finance, David Gilbert of JGI Public Affairs, Rebekah Sehorn of JGI Operations, Kristen Taylor of the Genome Data Group, and the ad hoc JGI jury. Harry was fresh off a resounding victory two months earlier on the Hill at the 2004 Berkeley Lab Facilities Chili Cook-Off with his Chili Willy team, JGI's Phil Bach and Victor Hepa.

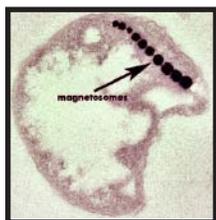


Chili Challengers from left: Harry Bash, Laura Johnson, Brent Sanders, Kathy Richie and Jimmy Choy.

Harry attributed the success of his recipe to the spices he ordered from New Mexico, and the secret California red wine marinade (half for the chef, half for the chili pot) he used to tame the Black Angus tri-tip—expertly chopped by Carolyn Vertuca.

The chili-adorned dogs were expertly grilled by JGI Operations head Hank Glauser and JGI carpenter Joe Herrera. Brent Sanders tempered his second place bowl of red with clove that hinted at citrus which serves to ease the heat on the palate. Honorable mention awards were earned by Jimmy Choy (vegetarian black bean chili), Laura Johnson (for a “blonde” chicken-based chili), and Kathy Richie (a German-influenced blend with celery as a mainstay).

Science Behind the Sequence



Beginning on Wednesday, December 1st at 4 pm, JGI researcher Jenna Morgan will help resurrect the “Science Behind the Sequence” series. The short talks will be geared towards a diverse audience of JGI listeners, from administrative to scientific staff. For the first discussion, Jenna has chosen the microbe *Magnetococcus* MC-1. This “bug” uses a chain of magnets embedded in its cells as a compass to find favorable environmental conditions. The presentation and discussion will be followed by refreshments.

GOT FLU? Stay Home!

It's that time of year again . . . and once again we urge you (insist, really), if you're not feeling well, to stay home.

We do appreciate that the work you do here may be critical to the JGI's productivity, but just imagine the devastating impact to the PGF if you bring your unwelcome microbes to work with you.

Due to the flu vaccine shortage, we need to be particularly vigilant about keeping JGI “flu-free.”

The Center for Disease Control and Prevention recommends:

- Avoid close contact with people who are sick. If you are sick, keep your distance from others to protect them from getting sick too.
- Cover your mouth and nose with a tissue when coughing or sneezing. It may prevent those around you from getting sick.

- Clean your hands. Washing your hands often will help protect you from germs.
- Avoid touching your eyes, nose or mouth. Germs are often spread when a person touches something that is contaminated with germs and then touches his or her face.
- And above all . . . stay home when you are sick!

For more flu information, see: <http://www.cdc.gov/flu/>

JGI HOLIDAY BANQUET—HOLD THE DATE

Zio Fraedo's, home of fine continental cuisine in Pleasant Hill (611 Gregory Lane) will be the venue for the 2004 JGI Holiday Banquet, on Thursday, December 16th, starting at 6 pm. Details to follow soon.

Microbial Revamp

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draft sequencing effort. Alla will be responsible for the timely completion of projects and the generation of the Quality Draft (QD) assemblies. She will also set up transfer of data to Oak Ridge National Laboratory, where annotation activities will be conducted. Her Microbial Genomics group will evaluate assemblers with the goal of improving draft assemblies while reducing time and effort required for finishing.

Patrick Chain, an LLNL biologist, will coordinate the activities of the different finishing groups and ensure the timely completion of genomes. He will also prepare data for Quality Assessment and transfer to Stanford. Patrick will also develop tracking tools and metrics for the group, and will write and distribute Standard Operating Procedures for Finishing.

JGI-Stanford's Jeremy Schmutz will lead the Quality Assessment effort. This entails developing metrics and standards for finished microbial genomes. He will receive finished data and perform standard procedures for quality assessment and characterization of potential problems in the assemblies. Jeremy ultimately signs off on public release of finished genomes.

Frank Larimer from JGI-Oak Ridge National Laboratory (ORNL) will lead the Automated Annotation effort. He will receive draft and finished microbial projects for automated annotation and send data back in GenBank format for deposition in public databases and for input into the Integrated Microbial Genome Database (IMG) under development at the PGF.

Nikos Kyrpides will be tasked with Genome Analysis and establishing and maintaining IMG. Among his priorities will be to define the data import format and work with ORNL for implementation. Also, he will implement visualization/editing tools for distributed manual annotation of genomes.

JGI OPERATIONS UPDATE

To bring everyone current on the move plans: JGI Operations head Hank Glauser says there are a number of procedures we must go through to achieve our goal of moving the Informatics Department to a new location. This process includes LBNL negotiating a tentative lease agreement, which goes through the LBNL internal review process, then on to the DOE Berkeley Site Office for review, the DOE Chicago Regional Office where they handle real estate matters, and DOE headquarters where they handle financial matters. It is returned to the UC Office of the President and then goes back to LBNL for final signature. Currently, this request is in final negotiation, with the landlord having received all reviews from UC and DOE.

Once this approval has all the proper signatures, the plans and specifications go to the landlord, the building permit is acquired and the subcontractors are then hired to make modifications to the property. This could take a month or more. Then the building is ours, at which time we can construct cubicles,

install furniture, and move in.

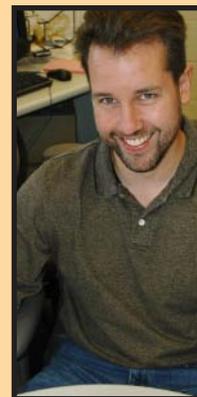
The plans are to move fifty employees to this new facility, which will provide space for nine enclosed offices, forty cubicles, and a reception area. There will be two conference rooms, one with video teleconferencing capabilities, a lunchroom with vending machines, and rest rooms with lockers and showers. All office space will be equipped with ergonomically correct furniture including adjustable desks. For those of you who already have your own chair, you can take that with you. For those needing to order a chair, you should contact Jimmy Choy.

The new facility (currently being called B100A) is a seven-minute walk from JGI and will be a welcome relief by providing extra office and meeting space. Other projects to be completed this FY are the construction of the new data center in B400 (scheduled to start in December), followed by the large sequencing bay in B100, and potentially a new conference center in B100. Should the lease fall through for whatever reason, contingency plans are being developed to accommodate immediate JGI needs.

SPOT AWARDS



Congratulations to **Sandra Chaparro** for winning a Spot Award for her contributions to improving the ADIOS procurement system and to **Jason Baumohl** for designing and implementing a hands-on DNA sequence assembly activity for the JGI high school tour program.



JGI SEMINAR CALENDAR

The following is the list of November and December Life Sciences & Genomics Fall Seminars.

These meetings are held at LBNL, Building 66 Auditorium, and televised at JGI in the B400 Large Conference Room on Tuesdays from 4:00-5:00 pm (except November 30). See below.

NOV. 2

Ronald Davis, Stanford Genome Technology Center

“New Genomic Technology for Yeast & Humans”

NOV. 9

Terry Hazen, LBNL

“Ecogenomics and Phenomics—the New Frontier in Bioremediation of Toxic Waste Sites”

NOV. 16

Frank Cucinotta, NASA Johnson Space Center

“Computational Models in Space Radiation Risk Assessments”

NOV. 30

Douglas Wallace, University of California, Irvine

“Ancient Origins—Modern Diseases: A Mitochondrial Connection”
This seminar will be at JGI.

DEC. 7

No seminar

(Poplar Annotation Jamboree held at JGI this week)

DEC. 14

Richard Kolesnick, Memorial Sloan-Kettering Cancer Center

“Manipulating the Vascular Component of the Radiation Tumor Response”

DEC. 21

Karl Stetter, University of Regensburg, Germany

Title to be announced

New JGI employees/ supplemental labor hired since August:

Feng Chen
Genomic Technologies

Joni Fazo
Computational Genomics

Teresa Green
Operations

Joseph Herrera
Facilities

David Hillman
Genomic Technologies

Yigong Lou
Computational Genomics

Thanos Lykidis
Computational Genomics

Rebekah Sehorn
Production

Amber Shao
Computational Genomics

Cailyn Spurrell
Production/QC

Kristen Taylor
Computational Genomics

Mary Trotter
Production

Rochelle Vaughn
Operations

Xueling Zhao
Computational Genomics

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