First draft of transgenic papaya genome yields many fruits

By Diana Yates
News Bureau Staff Writer

A broad collaboration of research institutions in the U.S. and China has produced a first draft of the papaya genome. This draft, which spells out more genome information is available. The others for which detailed genome sequences are available.

Papaya is one of the most nutritious fruits known. Its melon-like fruit is packed with nutrients such as vitamin C, vitamin A, and beta-carotene.

“Nutritious” Papaya is one of the most nutritious fruits. The new study sheds light on its evolution and that of other flowering plants.

Lost town

Plans are under way to continue excavation of New Philadelphia, a western Illinois town where racial harmony existed a quarter century before the Civil War.

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Lleras receives NSF CAREER award

By Diane Voila

Santiago Lleras, a UI assistant professor and chairman of the university’s Department of Linguistics, has been awarded the National Science Foundation’s (NSF) CAREER award from the National Institutes of Health. The NSF CAREER award will be distributed over five years ($370,000).

The award supports early-career development of teachers who are most effective at using the latest research in their courses and in educational settings to improve the quality of classroom teaching and to produce students who are better prepared for future academic study and careers.

Lleras is the first professor in the UI College of Liberal Arts and Sciences to receive a CAREER award from the National Science Foundation. The President of the United States presents the award to distinguished faculty members who have an outstanding record of integrating teaching and research and who effectively combine educational and research programs that have the potential to make a significant contribution to the products of higher education. The NSF CAREER award is considered one of the most prestigious awards presented by the NSF.

Lleras has been an assistant professor at the UI since 2002. He has received several awards and has been recognized for his work in the field of music cognition and neural plasticity.

The award will support Lleras’ work on the topic of music cognition and neural plasticity. Lleras has been working on this topic for several years, and the award will allow him to continue his research and to expand his work on the topic.

Lleras is also the director of the Center for Music and the Brain, a research center that studies the relationship between music and the brain. The center is located at the University of Illinois at Urbana-Champaign and is supported by the National Science Foundation.

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Eight honored with Chancellor’s Award

By Roxana Ryan

The award ceremony, held in the Student Center on May 1, honored 38 units for their support of the university’s mission.

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May 1, 2008

Distinguished Staff Award

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May 1, 2008

Photography by L. Brian Stauffer

Short has conducted 31 basic courses for the fire department’s fire fighters and was instrumental in the certification of 101 firefighters in the system’s pre-senior, pre-service academy program.

According to his nominator, Assistant Fire Chief John Ward, Short is a “great fit" for the department. “Short is a great leader and is very effective in his role as both a leader and as a team player. He is very knowledgeable about the department and has a great understanding of the rules and regulations. His strong leadership skills and his experience with the department have helped him to make the transition from the fire academy to the fire department smoothly.”

Short has received various awards and recognitions throughout his career, including the 2007 Firefighter of the Year Award, the 2008 Firefighter of the Year Award, and the 2009 Firefighter of the Year Award. He is currently enrolled in the Fire Administration Program at the University of Illinois at Urbana-Champaign and is expected to graduate in May 2010.

Gary A. Watson, a facilities planning officer in the Division of Public Safety, serves the university as a whole. He is the first to offer assistance, realizing that his responsibilities to his current assignment are no more or less important than the day-to-day operations of the university police department.

Wilson said, “This is a huge operation. The most striking thing about her performance is her ability to be there for the people who need it when they need it. She is always available to answer questions, provide guidance, and give support.”

Laura Haber, program coordinator of University Facilities Planning Programs, said, “This is a huge operation. The most striking thing about her performance is her ability to be there for the people who need it when they need it. She is always available to answer questions, provide guidance, and give support.”

May 1, 2008

Teresa L. Borten, administrative secretary in the Wasinger Strategic Planning Office, said, “This year we crafted a cross-college proposal to support the university’s strategic plan. I am happy to see that it has resulted in our facility looking the best it ever has.”

According to her nominators, Miller, the sole director of human resources and communications, is “one of those rare people that offer creative solutions to problems rather than complaining or being negative.”

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May 1, 2008
New certification program for HR managers is planned

By Jan Dennis
News Bureau Staff Writer

Almeida, who teaches classes on mergers.

Overlapping territories, such as a rumored marriage of United and US Airways, could lead to more consolidations by airlines with company officials Monday when the airlines struck a deal for remaining seats and, in turn, ticket prices.

More mergers are possible in an industry beleaguered by federal and state employment laws.

The UI Center for Human Resource Management, director of the center, the Illinois HR Excellence program will offer its first workshops this fall, will conduct a series of core courses and electives, including projects that target actual work environments.

Some managers may opt to take electives, however, rather than pursuing a certificate. Drasgow said.

Workshops will be taught by UI faculty members, select Ph.D. students and seasoned professionals and will cost about $350 each, with a discount for those who register for multiple workshops.

The new certification program will immediately make Illinois a better place to work and do business, Drasgow and state chamber officials say.

“I think better HR practices will lead to good business practices. That, in turn, will lead to more profitability, better wages and more jobs,” Drasgow said.

“More importantly, maybe employees will just have to go to work.”

For more information, call Drasgow at 335-0981, Julie Biren of the Illinois Chamber of Commerce at 217-522-5512 or visit the program’s Web site.

On the Web

Illinois HR Excellence
http://ilhr.eceans.org

UI Web developer is consultant for ‘Numb3rs’ TV show

By Roxana Ryan
News Bureau Intern

A proposed merger of Delta and Northwest airlines likely won’t drive up the cost of flying, but that could change if the deal spurs a flurry of consolidations among U.S. carriers, a UI business professor says.

Despite many studies trying to explain the likelihood of a final cut of the show, she said: “We have to understand there are so many budget and time constraints we don’t know/show how. If we tell them something is a bonus, we always provide an alternative or ask them to consider other scripts. I also don’t suggest that could make the show more contemporary because the scenes ‘they’ are discussing aren’t 10 years old.”

So much as the show’s times to be accurate, Young said it is important for it to be entertaining as well.

The show “MA*SH” didn’t teach people how to be surgeons or about the Korean War, she said. The purpose of these shows ultimately is to entertain. In our show, the hero is a scientific researcher and that’s a bonus how you look at it. There are so few shows that features scientists, their research and the academic world. This show is giving the public a view they don’t usually receive.”

Young, however, doesn’t have the problem of being uninterested in the sci-ences. Her mother is an aeronautics engineer and chemist and her father is a retired physicist.

“I definitely have a fuller appreciation of how much work goes into a single TV episode,” she said. “The work in ‘Numb3rs’ really does pertain to the topic being presented and the show tries to be as accurate as possible. Each equation or graph you see really pertain to the situation in the script.”

“Working on the show is almost a hobby,” she said. “I also love gardening, ballet dancing and hiking. I hope to continue providing feedback for ‘Numb3rs’ for as long as they need me.”

On THE WEB

www.cbs.com/numb3rs

Doing the math

Amy Young, a Web and database developer at the Materials Computation Center, is a script consultant for the show “Numb3rs.” “I definitely have a fuller appreciation of how much work goes into a single TV episode.”

“Forty-two hours is just a single TV episode,” she said. “So much as the times to be accurate, Young said it is important for it to be entertaining as well.”

Young’s 14-year-old niece watches the hit CBS TV show is benefiting from the success on the show. “My niece would rather see a script and it’s still hard to predict things. Despite many studies trying to explain the number of government dollars spent, science still hasn’t mitigated the way the medicine is.”

“Those projects will provide background and confidence to those with experience, but formal education is still needed,” Drasgow said.

“Complying with federal and Illinois law is very difficult and it doesn’t make it to the final cut of the show,” she said.

“We can’t be disappointed when an idea or suggestion we had doesn’t make it to the final cut of the show,” she said. “We have to understand there are many budget and time constraints we don’t know/show how. If we tell them something is a bonus, we always provide an alternative or ask them to consider other scripts. I also don’t suggest that could make the show more contemporary because the scenes ‘they’ are discussing aren’t 10 years old.”

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“Those projects will provide background and confidence to those with experience, but formal education is still needed,” Drasgow said.

“The laws are written in such a way that they don’t tell you how to do anything, so this can help with that gray area.”

The program, which will last one day this fall, will help workers keep pace with these changes.

“Oil prices are one factor, but the industry is going through a lot of change. With the atmosphere, you have to go through a lot of change. With the atmosphere, you have to go through a lot of why it could be good about the international context,” Almeida said.

“Mergers are possible in an industry beleaguered by high oil prices and still competition that has contributed to a recent surge of airline bankruptcies,” Almeida said.

“Oil prices are one factor, but the industry is going through a lot of change. With the atmosphere, you have to go through a lot of change. With the atmosphere, you have to go through a lot of why it could be good about the international context,” Almeida said.
New virus The agent that infected the monkeys “looked a little bit like monkeypox virion, a little bit like cowpox virus, but not exactly like any of them,” said Troy Goldberg, a UI professor of veterinary pathobiology and anthropology. Goldberg said, but their potential for adaptation to other animals and humans warrants more attention. Some believe the smallpox, which killed 900 to 500 million people in the 20th century, is now known in Africa. The researchers tracked the virus in 2006 and 2007 in West Africa, where it is relatively high prevalence.

Fed juggling inflation, economy as it considers rate cut

Inflation concerns are weighing on Federal Reserve Chairman Ben Bernanke and his colleagues as they consider the possibility of a recession.

Bernanke said the Fed would act in short-term interest rates in the next few months if necessary, to support the economy. Bernanke said that he is not sure how much the economy would respond to lower interest rates.

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Twenty-four honored for excellence in teaching, advising

By Stephanie Lulay

Fourteen professors, three academic professionals and five teaching assistants at the UI were honored April 29 for excellence in teaching and advising. The recipients were recognized during a reception at Alice Campbell Alumni Center.

Faculty winners of the Campus Award for Excellence in Undergraduate Teaching are: Andrew Allemy, mechanical science and engineering; Cleora D’Arcy, crop sciences; Matthew Ehrlich, journalism; Lisa Mond-Amaya, special education; and Alex Winter-Nelson, agricultural and consumer economics.

Instructional staff winners who received the award are: Phoebe Lee, Marie-Christine Brunet, electrical and computer engineering; and Stephen Notaro, kinesiology and community health.

Graduate teaching assistant winners of the award are: Abrim Bicakci, natural resources and environmental sciences; Ryan Blum, communication (formerly speech communication); Luis Herrera, Latin American and Caribbean Studies; Tara Larsh, social work; and Tara Lyons, English.

Dale Brodhurst, professor of communication, and Bruce Smith, professor of law, received the Award for Excellence in Graduate and Professional Teaching.

The awards recognize professors and graduate teaching assistants who display consistently excellent performance in the classroom, take innovative approaches to teaching, positively affect the lives of their students, and make other contributions to improved instruction, including influencing the curriculum.

Faculty members selected for the awards receive $5,000 and a $3,000 raise; instructional staff members receive $4,000 and a $1,500 raise; graduate teaching assistants receive $3,500.

Other award winners honored:

Annie Abbott, professor of Spanish, Italian and Portuguese; and Rajeshwari Pandharipande, professor of religious studies, were recognized as 2008-09 Distinguished Teachers/Scholars. The program promotes excellence in teaching by honoring and supporting outstanding faculty members who take an active role in enhancing teaching and learning on the UI campus.

During the upcoming year, these honorees will utilize their skills to mentor other faculty members. They will retain the title of University Distinguished Teacher/Scholar throughout their Illinois careers.

Andrew Ellinger, professor of human resource education, received the Award for Excellence in Off-Campus Teaching, which provides the recipient with $5,000.

Jeffrey Woods, associate professor of kinesiology and community health, received the Campus Award and for Excellence in Guiding Undergraduate Research. The $2,000 award is designed to foster and reward excellence in involving and guiding undergraduate students in scholarly research.

Schuyler Korman, professor of molecular genetics, and Michelle Ortolano, professor of special education, received the Award for Excellence in Mentoring Graduate Students. Each award recipient receives $2,000.

Three were honored with the Award for Excellence in Advising Undergraduate Students: Carl Nickels, professor of Germanic languages and literatures; James Phillips, professor of mechanical science and engineering; and Gary Spada, academic advisor in the School of Integrative Biology. Each award winner receives $2,000.

Dara Castelli, professor of kinesiology and community health, was honored with the Award for Innovation in Undergraduate Instruction. The award provides $2,000 to the recipient.

In addition, the student organization Delta Sigma Omicron honored history professor John Lynn with its Distinguished Teacher Award and $300. Lynn was nominated by a student in his LAS Courses Abroad history class that studies in Paris for making the class accessible.
A new low-temperature, catalyst-free technique for growing copper nanowires has been developed by researchers at the UI. The copper nanowires could serve as components in electronic device fabrication and as electrocatalysts in a television-like, very thin flat-panel display known as a field-emission display.

“We can grow forests of free-standing copper nanowires of controlled diameter and length, suitable for integration into electronic devices,” said Kyekyoon “Kevin” Kim, a professor of electrical and computer engineering. “The copper nanowires are grown on a variety of surfaces, including glass, metal and plastics, by chemical vapor deposition from a precursor,” said Hyungsoo Choi, a research professor in the Micro and Nanotechnology Laboratory, and in the department of electrical and computer engineering. “The technological opportunities are enormous,” Kim said. “This process is compatible with contemporary silicon-processing protocols. Furthermore, the nanowires serve as building blocks for a variety of applications. As a 3-D nanostructure with a high aspect ratio, a copper nanowire could be used as a nanowire transistor, nanowire interconnect or even as a nanowire photodetector.”

Typically, the nanowires of 30 to 250 nanometers in diameter are grown on a silicon substrate at temperatures of 200 to 380 degrees Celsius and require no seed or catalyst. The size of the nanowires is controlled by the processing conditions, such as substrate, substrate temperature, deposition time and precursor feeding rate. The columnar, five-sided nanowires terminate in sharp, pointed tips that facilitate electron emission.

To demonstrate the practicability of the low-temperature growth process, the researchers first grew an array of copper nanowires on a patterned silicon substrate. Then they fashioned a field-emission display based on the array’s bundle of nanowires. In a field-emission display, electrons emitted from the nanowires strike a phosphor coating of the display, electrons emitted from the nanowires strike a phosphor coating to produce an image. Because the researchers used a bundle of nanowires for each pixel, in their display, the failure of a few nanowires will not ruin the display.

“The emission characteristics of the copper nanowires in our proof-of-principle field-emission display were very good,” said Kim, who is also affiliated with the UI’s department of materials science and engineering, department of aerospace engineering, department of nuclear, plasma and radiological engineering, Beckman Institute, Micro and Nanotechnology Laboratory, and the Institute for Geometric Biology. “Our experimental results suggest bundled nanowires could lead to longer-lasting field-emission displays.”

In addition to working on flexible displays made from copper nanowires grown on bendable plastic, the researchers are also working on silver nanowires.

With Kim and Choi, co-authors of the paper are graduate student Wenhua Gu, postdoctoral research associate Martha Brito, and professor and head of materials science and engineering Ian Robertson.

Funding was provided by the U.S. Department of Energy, which is partially funded by the U.S. Department of Energy. ©

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Students’ design efforts address disability issues

By Melissa Mitchell

With UI sophomore Stephen Diebold signing up for Diana McDonagh’s industrial design studio course, he figured he might get experience designing a prototype for a lamp or some other common consumer product.

But Diebold, whose specialty is ergonomic design—that is, designing products rather than for a specific set of users but rather for a specific set of users, had a lot more at Stake for the projects but students would be charged with designing. The undergraduates and graduate students in her course would be paired with someone who had the potential to change lives.

The industrial design students were matched with students enrolled with the UI’s Disability Resources and Educational Services and with members of the campus’s Delta Sigma Omicron sister fraternity. The design students’ assignment was to work—one-on-one or two-on-one—with DRES and DSO students to create simple, low-tech design prototypes that could enhance the independence and quality of life of students with disabilities.

The frills of the teams’ collaborative labor are on view in an exhibition called Disability + Design at the U of I’s Illini Union Art Gallery through May 5.

For his project, Diebold was paired with Jonathan, a law student with quadriplegia who incurred a spinal cord injury during a swimming accident. After shadowing Jonathan for a week to better assess his everyday needs, Diebold decided to create a chin pointer that could help Jonathan better interact with his environment.

In effect, Diebold said, the device—a stick-like tool attached to a clear acrylic chin guard help keep the pointer on while the wearer is moving—was an easily accessible bag that attaches to the chin frame, a tool that enables a user with low vision to cut draw and cut a straight line, a stylish, custom-made purse that hangs around the wearer’s neck, and a reaching tool with a flexible plunger-like end that makes it possible to grab objects of varying shapes and sizes.

Another design solution, for a person who uses a high-tech prosthetic leg that makes it possible to grab objects of varying shapes and sizes.

Designing women Faculty and staff members, from left, Suann Sears, Disability Resources and Educational Services, Diana McDonagh, industrial design, and Jeannine Gallowi’s Illini Design Group, proposed their projects to learn more about innovative project matching students in Diebold’s industrial design class with DRES students and members of Delta Sigma Omicron service fraternity. The design students were charged with creating simple, low-tech prototypes and prototypes that could enhance the independence of students with disabilities. The product prototypes—which include a stylish, custom-made purse that hangs around the wearer’s neck, and a reaching tool with a flexible plunger-like end that makes it possible to grab objects of varying shapes and sizes.

After the pair teamed with Suann Sears, a DRES disability specialist, McDonagh said the two quickly realized that their respective experience and creative abilities, “the idea had much greater potential.”

And if everything goes according to plan, that potential has only just begun to be tapped.

McDonagh is hoping to secure funding to foder a course that would enroll design students as well as students with disabilities. In addition to the goal of involving the latter group in the design process in order to produce more effective assistive devices, McDonagh hopes the experience will be a catalyst for more students with disabilities to consider careers in industrial design.

What motivated me to put those two things together was that there is nowhere else you could do that,” McDonagh said. “This is a really unique campus. Along with the (academic) caliber of our students, we have the oldest industrial design program and the oldest program for disability education and rehabilitation.”

McDonagh’s ambitious plans don’t end with a forbidding design-disability education course. She also wants to initiate a pilot study, perhaps at the UI’s Beckman Institute, where she has a faculty appointment.

And while the students in this year’s class created the designs on their own, her larger plan for the future would include collaborations with faculty and students from Beckman, who could contribute to their technological expertise in the design process.

“This is my vision: an institute where students—regardless of their abilities or disabilities—would design housing, and design the doors, chairs and furniture that would be used on this campus,” McDonagh said. “It would be radically different.

The nature of the recent collaboration and conceptual forums that would bring together designers and individuals with disabilities is a perfect example of a basic principle of empathic design that the professor said she likes to emphasize in her classroom.

“There’s a quote I like to use. ‘Design is too important to leave to designers.’”

Campuswide Undergraduate Research Symposium explores importance of mentoring relationships

The campus’ inaugural Undergraduate Research Symposium was held April 29 at the Illini Union. This symposium was an opportunity to showcase our finest undergraduate research and creative efforts and highlights the impressive achievements of our highly capable student population,” said Provost Linda Katehi.

According to Katehi, nearly 40 percent of the UI’s undergraduate students participate in research or creative activities outside the classroom during their studies.

“Over the next five years, we aim to involve greater numbers of undergraduates in research and creative endeavors under the leadership of faculty mentors,” Katehi said in her welcoming remarks. “As an institution where research, innovation and creative activities flourish, we strive to make involvement in such activities a hallmark of the Illinois undergraduate experience.”

With presentations included more than 100 presentations on research by undergraduates, multiple presentations took place concurrently throughout the day in the Illini Union.

Dorothy Espelage, a professor of educational psychology, and two of her former students delivered the keynote address about building lifelong mentoring relationships through undergraduate research participation.

Among the student presentations—generally scheduled for 15 minutes apiece—were media production projects, a digital age, leisure and arthritis among older adults, disability and relevant design, individual ten readers, social consequences of youth depression, addiction and psychological needs. The event is an initiative that grew out of the Campus Strategic Plan.

Undergraduate research

Zack Johnson, a junior in integrative biology and neuroscience, in the College of Liberal Arts and Sciences, explained his presentation on the “Neuroendocrinological Significance of Conditioned Responses to Cocaine in Rats” as part of the Undergraduate Research Symposium on April 29. The symposium included more than 200 presentations on research by undergraduates. The event grew out of the Campus Strategic Plan.

Celebrating excellence

Brigitte Baker, at microphone, and other members of the Illini Voices Social Transition group performed in the Courtyard Live at the Illini Union during the April 29 undergraduate Undergraduate Research Symposium at the Illini Union. The event, which celebrated the best of what students are accomplishing in collaboration with their mentors, also featured student performances that afternoon.

Filling a need

Industrial design student Stephen Diebold displays the chin pointer he designed with input from Jonathan, a UI student with quadriplegia. The device, which can be worn around the neck when not in use, allows the user to reach objects, type, use a phone keypad and operate switches.
benefits

Benefit Choice enrolling May 3-31

The College of Law highly values its employees. The College is pleased to announce the 20th Annual Benefit Choice Plan for the 2008-2009 plan year. Employees who enroll during Benefit Choice 2008 and who have a dependent child who will turn 18 during 2008 may designate the child as a dependent for 2009. The child’s enrollment fee for 2009 will be $125 instead of $265. Visit the Benefits Office in the Illini Union to discuss your options and receive a completed online form.

Personal life insurance

In this era of declining life insurance, it is important to have the proper amount of life insurance for your family. To ensure that you have the proper amount of life insurance, please visit the Benefits Office or call 248-2500.

Virtual College is a new online program that allows students to complete courses at any time and from anywhere in the world. It is an online degree program that can be completed in 2 years.

Career Services

Career Services is here to help! We provide services to students and employers. We offer career counseling, resume writing, interview preparation, and job search strategies. We also conduct workshops on job searching and writing effective resumes. To schedule an appointment with one of our career counselors, please call 248-2500.

Human Resources

Human Resources provides a wide range of support services for employees. We offer employee assistance programs, employee benefits, and HR policies and procedures. We also manage the HR department and provide support to other departments within the College.

Benefits Office

The Benefits Office is located in the Illini Union. The office is open Monday through Friday from 8:30 a.m. to 4:30 p.m. The office can be reached at 248-2500.

College of Law

The College of Law is located in the Illini Union. The college offers a comprehensive legal education program that prepares students for careers in law. The college also provides a wide range of services to the community, including legal assistance and pro bono work.

The University of Illinois at Urbana-Champaign is an Equal Opportunity/Equal Access institution and does not discriminate on the basis of sex, race, age, color, national origin, religion, or disability in the administration of its educational policies, admissions policies, scholarship and loan programs, athletic and other campus programs.

For More Information

For more information about your options and the benefits available to you, please visit the Benefits Office or call 248-2500.

Relaxation Room

Relaxation Room is a collaboration of McKinley Health Services and of the Office of Student Diversity and Engagement. The Relaxation Room is located in the Illini Union. It provides a comfortable space for students to unwind and relax.

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For More Information

For more information about the Relaxation Room or other resources for mental health and wellness, please contact the Office of Student Diversity and Engagement at 248-2500 or visit their website at http://www.science.uiuc.edu/.

The College of Liberal Arts and Sciences is located in the Illini Union. The college offers a wide range of programs and degrees in the arts and sciences. The college also provides a variety of services to students, including counseling, academics, and community outreach.

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For More Information

For more information about the College of Liberal Arts and Sciences or other resources for mental health and wellness, please contact the Office of Student Diversity and Engagement at 248-2500 or visit their website at http://www.science.uiuc.edu/.

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For More Information

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CALENDAR, CONTINUED FROM PAGE 18

May 1, 2008


Weingarten, Monte. 3:30 p.m. PhD Oral Defense. "Complexity and Predictability in Biological Systems: Pattern Formation and Multiscale Dynamics." Humanities 110. 7 days before defense.

Minato, Ken. 3:30 p.m. PhD Oral Defense. "Study on the Effects of the Glutamate Receptor Agonist, 3-Methyl-4-pyridine, on the Development of the Spinal Cord." Humanities 110. 7 days before defense.

Boyd, David. 3:30 p.m. PhD Oral Defense. "Effects of Postnatal Exposure to a Low Sodium Diet Upon Blood Pressure." Humanities 110. 7 days before defense.

Ahn, Soon. 3:30 p.m. PhD Oral Defense. "The Role of Thrombomodulin and Protease Activated Receptor-1 in the Regulation of Thrombin-induced Endothelial Cell Adhesion." Humanities 110. 7 days before defense.

Bourne, Martin. 3:30 p.m. PhD Oral Defense. "Characterization of Mitotic Kinase Interactions with Cdc25 and Aurora Kinase A during Mitotic Progression." Humanities 110. 7 days before defense.

Buldini, Daniele. 3:30 p.m. PhD Oral Defense. "An integrated approach for the study of new anti-infective agents against multidrug resistant bacteria: doxycycline and lipopeptide derivatives." Humanities 110. 7 days before defense.

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PAPAYA, CONTINUED FROM PAGE 1

like flesh is high in provitamin A, vitamin C, flavonoids, folic acid, pantothenic acid, potassium, magnesium and fiber.

The papaya plant also produces papain, a digestive enzyme that is used in brewing, meat tenderizing, and in some cosmetics and pharmaceutical products. Today it is cultivated in tropical and subtropical regions of the world. Global trade in papaya averaged $113 million in 1998-2003.

The new analysis revealed that papaya has fewer functional genes than any other flowering plant for which genome sequence is available. Its allotment of genes for key enzymes also differs significantly from its counterparts. Papaya contains more genes for enzymes involved in cell-wall expansion and starch production than Arabidopsis does. Papaya also contains more genes for volatile compounds, the odors that attract pollinators and animals that eat the fruit and disperse its seeds.

The number of genes dedicated to lignin synthesis in papaya is intermediate between that of poplar, which contains more such genes, and Arabidopsis, which has fewer. This makes sense, Ming said, because papaya is evolving from an herbaceous plant into a woody tree.

Papaya was introduced to Hawaii in the 1800s, and the production of papaya in Hawaii grew into a major industry. That industry faced a crisis in 1992, however, when the papaya ringspot virus (PRSV) was first identified in Puna, the center of Hawaiian papaya production.

PRSV affects papaya production throughout the world. The virus interferes with the plant’s ability to photosynthesize. Affected plants are stunted and often produce deformed and inedible fruit. Papaya production in Hawaii dropped from 55.8 million pounds to 35.6 million pounds between 1992 and 1998 as a result of the virus.

Using a technique developed in 1986 that involved randomly inserting a viral coat protein gene into a plant to give the plant immunity to the virus, in the early 1990s scientists at Cornell and the University of Hawaii (led by Dennis Gonsalves, who is now director of the USDA’s U.S. Pacific Basin Agricultural Research Center) developed a transgenic papaya that was resistant to PRSV. The new study has found that the transgenic insertions occurred in only three places in the papaya genome, and that no nuclear genes were disrupted.

Having detailed information about the location of insertions in the transgenic papaya plants will aid the deregulation process in places such as Japan, where so far import of transgenic papaya plants is not allowed.

The papaya genome project involved researchers at 22 institutions, led by Maqsudul Alam at the University of Hawaii. A majority of the funding was provided by the University of Hawaii, the Department of Defense, the Hawaii Agriculture Research Center and Nakai University, China.

Ming is an affiliate of the Hawaii Agriculture Research Center and the UI Institute for Genomic Biology.