Landmark study unlocks stem cell, DNA secrets to speed therapies

By Libby Fairhurst
NEWS AND PUBLIC AFFAIRS

In a groundbreaking study led by an eminent molecular biologist at The Florida State University, researchers have discovered that as embryonic stem cells turn into different cell types, there are dramatic corresponding changes to the order in which DNA is replicated and reorganized.

The findings bridge a critical knowledge gap for stem cell biologists, enabling them to better understand the enormously complex process by which DNA is repackaged during differentiation — when embryonic stem cells, jacks of all cellular trades, lose their anything-goes attitude and become masters of specialized functions.

As a result, scientists now are one significant step closer to

Please see LANDMARK STUDY, 11

From cloudy to clear: Book explores history of meteorology

For much of the first half of the 20th century, meteorology was more art than science, relying heavily on an individual forecaster’s lifetime of local experience. Now, a Florida State University researcher has written a book that tells the story of the field’s transformation from a “guessing science” into a sophisticated scientific discipline based on physics and mathematics.

“Weather by the Numbers: The Genesis of Modern Meteorology” was written by Kristine Harper, an assistant professor of history at FSU, and was just published by the MIT Press. In her book, Harper says that the greatest factor making the transformation of meteorology possible was the development of the electronic digital computer. Earlier attempts at numerical weather prediction had faltered on the human inability to solve nonlinear equations quickly enough for timely forecasting.

“A weather forecast is of little use if it is made several weeks after the weather has come and gone,” Harper noted.

After World War II, the combination of an expanded observation network developed for military purposes, newly trained meteorologists savvy about math

Please see WEATHER, 11

SPREAD the WORD

At The Florida State University, conducting research isn’t just for graduate students anymore. More than 3,000 undergraduate students and faculty members are working together on research projects.
Achieving Financial Balance in an Unbalanced Economy

Free Report Available

Confusion and chaos are rampant in the financial marketplace. Just look at the headlines regarding the government bailout, the subprime mess, real estate values, the stock market now plummeting, interest rates, and worries about inflation. Add to this all the rhetoric being presented by both political parties, no wonder people are paralyzed and afraid to make financial decisions. Can you blame them?

I think it’s important to understand what got us where we are. Most people are simply out of balance, financially speaking. We’ve become a nation of spenders. We have too much debt, both mortgage and credit card debt. We’ve forgotten how to save money.

When working with my clients, I use a program called The Living Balance Sheet®. We focus on four financial domains: Protection, Assets, Liabilities, and Cash Flow.

**Protection:** We focus on protection first, full replacement and lifetime protection. I want my clients to be fully protected in the event of an unplanned and untimely event such as a car accident, a hurricane, a fire or unexpected medical problems, disability and death.

**Assets:** in this domain, the focus is on increasing rate of return, with minimal risk. We look for tax advantages, and liquidity. Many people focus just on the rate of return and are taking undue risk.

**Liabilities:** here we work on eliminating debt, reducing taxes, and mortgage selection. Many people are in trouble today because they chose the wrong type of mortgage.

**Cash Flow:** our planning process encourages clients to increase their income, protect themselves first, build cost of living savings, look for debt and tax efficiency, and live a budgeted lifestyle.

I find it interesting that all of a sudden the financial press is telling us to be more conservative, save money and spend less. By using The Living Balance Sheet®, we always suggest that our clients do these things and be prepared for Life’s Unplanned and Untimely Events.

To schedule a FREE initial consultation call: 850-562-3000

To download your FREE Report: Understanding the Real Cost of Living, visit: www.JohnHCurry.com/lbs

John Curry earned his Master of Science in Financial Services and has authored several articles and special reports. He is a Senior Associate of the North Florida Financial Corporation. John has assisted thousands of people in planning for a Secure Retirement through his retirement workshops, speaking engagements, DVD’s and CD’s, and personal consultations. John may be contacted by calling (850) 562-3000, e-mailing john.curry@glic.com, or visiting his website www.JohnHCurry.com.

John Curry, CLU, ChFC, AEP, MSFS, CSA, CLTC—Registered Representative and Financial Advisor of Park Avenue Securities LLC (PAS), Securities Products/services and advisory services offered through PAS, a registered broker-dealer and investment advisor. Financial Representative, The Guardian Life Insurance Company of America (Guardian), New York, NY. PAS is an indirect, wholly owned subsidiary of Guardian. North Florida Financial Corporation is not an affiliate or subsidiary of PAS or Guardian.

The Living Balance Sheet® and its logo are registered trademarks of The Guardian Life Insurance Company of America, New York, NY. PAS is a member of FINRA, SIPC.
Year-end dates for processing charitable gifts to FSU

University employees who are responsible for processing or receiving gifts for their colleges or departments, take note: the Florida State University Foundation will have abbreviated business hours during the winter break.

To ensure donors’ year-end gifts reach the Foundation in a timely manner and are processed according to their wishes, the Foundation encourages employees to adhere to the following revised schedule.

The Foundation office will close at 2 p.m. on Wednesday, Dec. 24, and will remain closed through Monday, Dec. 29. The Foundation will be open from 8 a.m. to 5 p.m. on Tuesday, Dec. 30, and Wednesday, Dec. 31, to assist with year-end contributions and to process gifts.

Documents and donor instructions either can be mailed using campus mail code 2739 or hand-delivered to the Foundation office at 2010 Levy Ave., Building B, Suite 300.

After the holidays, employees should take a few moments to sort through their mail in order to identify charitable items and then deliver them, along with their respective envelopes, to the Foundation office by Friday, Jan. 9, 2009.

“We want to make all Florida State employees who receive year-end gifts aware of the urgency of transmitting those gifts and any donor instructions to us,” said Brianne Adachi of the Foundation’s Gift Processing Services.

For more information, send an e-mail to Adachi at badachi@foundation.fsu.edu, or call (850) 644-0770.

Dozens of Florida State University College of Business faculty, staff members and students participated in the “2008 Big Bend Start! Heart Walk,” a benefit for the American Heart Association on Oct. 18 at Tom Brown Park in Tallahassee. The college’s team raised more than $10,000 — nearly half of the $25,000 raised by all participating FSU employees. The annual event promotes awareness and prevention of the causes of heart disease.

“The impacts of climate change on Florida’s coasts and on our economy will be substantial, persistent and long-term, even under our conservative estimates.”

Julie Harrington, director of The Florida State University Center for Economic Forecasting and Analysis, as quoted by United Press International discussing the likely dire implications of global warming for the state of Florida over the 21st century. Harrington also was quoted by ScienceDaily and The Money Times.
Wetherell lauds commitment of faculty and staff members during annual address

By Jeffery Seay
EDITOR IN CHIEF

Under a pall of financial adversity, the Florida State University faculty continues to perform “impressive work” and defy conventional wisdom by doing more with less, according to President T.K. Wetherell.

“The quality of this institution hasn’t suffered as you might think it would have,” Wetherell said during the Annual Report of the President on the State of the University at the Fall Meeting of the General Faculty on Oct. 31. Florida State will most likely begin the 2009-2010 academic year with $50 million to $70 million less than it had at the beginning of 2007-2008.

In his address, Wetherell presented a list of accomplishments that served as evidence of the indefatigable drive of Florida State employees to improve the institution, including its 70 percent general-student graduation rate and its 90 percent student-retention rate, one of the highest in Florida.

“Twelve percent of our students are black, but they graduate at a higher rate than our other students — at 72 percent,” Wetherell said. “This rate is one of the highest in the nation among public graduate-research institutions and historically black institutions.”

Over the past five years, enrollment has increased by 32 percent. In that time, Florida State has admitted 70,000 high school students and 12,000 transfer students. It has graduated 33,000 baccalaureate, 8,600 master’s and 1,500 doctoral degree holders — a 23 percent increase.

“This represents impressive work from the faculty,” he said. “Clearly, our faculty and staff hasn’t sat around saying ‘We can’t do it,’ but ‘How can we do it?’”

He went on to praise the College of Motion Picture, Television and Recording Arts as the best in the nation and the College of Law as the best in the state.

“Dean Frank Patterson is one of the top 12 most influential people in Hollywood (Calif.), and he lives right here in Tallahassee,” Wetherell said. “If passing The Florida Bar exam is any indication of quality, then we’re the best because our students consistently pass at a higher
Fiscal health

The No. 1 priority for Florida State is to protect access, affordability and quality. Across-the-board budget cuts would not be considered, Wetherell said.

“We cannot maintain quality by taking a little bit from everybody and reducing the institution to mediocrity,” he said.

Wetherell has instructed Provost and Executive Vice President for Academic Affairs Lawrence G. Abele to head a Crisis Budget Committee, composed of the vice presidents, three faculty members, two staff members and the president of the student body.

“When we will begin to look at opportunities to decrease the budget but increase flexibility,” Wetherell said. “We will manage this economic crisis rather than have the crisis manage us.”

What’s more, Wetherell is proposing legislation, known as “Stand Up for Our Students,” that would offset budget cuts by giving Florida State and the University of Florida the ability to implement an emergency tuition increase.

“Those dollars will go toward ensuring we have high-quality faculty and classes for our students,” he said.

Even when implemented, the increase would not raise in-state tuition from its status as the nation’s cheapest.

“My grandson’s tuition for kindergarten is twice as high as that of Florida State students,” he joked. “That is affordability, if there ever was.”

Kidding aside, Wetherell said that the university had gone above and beyond legislative requirements in spring 2008 by putting $20 million into a need-based financial aid program.

Governance system

Florida State will promote improvements to the state’s higher-education governance system by encouraging the Board of Governors to act as a policy-making, not procedural, body. What’s more, Wetherell intends to lobby the legislature to reconsider making the state commissioner of Education an elected office.

Students

The university will continue its focus on students by providing an education in a nurturing environment.

“In surveys, our students tell us that they are getting an outstanding education from an outstanding faculty, and that they enjoy interacting with the faculty,” Wetherell said.

Private funding

Over the coming years, the raising of private funds will continue to be at the forefront of Florida State’s agenda.

Since the December 2005 conclusion of the FSU Connect capital campaign, which raised $617 million, the Foundation has raised an additional $300 million.

“The Foundation is having one of its best years ever,” Wetherell said.

He complimented the Foundation’s staff for the critical work it does to increase the ability of the university to carry out its mission.

Bridge building

A strong city of Tallahassee benefits Florida State as much as a strong Florida State benefits Tallahassee. Wetherell emphasized the importance of strengthening the so-called “town and gown” relationship between city and university, and nurturing a spirit of cooperation.

2008 Torch Awards

During the 2008 Fall Meeting of the General Faculty, the Florida State University Faculty Senate honored three people with Torch Awards for their distinguished contributions to the university. Betty Lou Joanos (B.S. ’57, Ph.D. ’85), left, received a Mores Torch Award for her service as a former faculty member and associate director of the FSU Alumni Association. JoAnn Blackwell, center, received a Mores Torch Award in recognition of her university career that began in 1965 as a bookkeeper and receptionist in the College of Education, and concluded as executive assistant to FSU President Emeritus Talbot “Sandy” D’Alemberte. Clifford R. Hinkle (B.S. ’71), right, received a Vires Torch Award for his current service on the FSU Foundation Board of Trustees, his decade of past service as a director of the FSU Research Foundation, and his past service on the board of the Seminole Boosters.
**Music-Play Project fosters ‘response-ability’ in children with autism**

By Libby Fairhurst

In a room dubbed the E-WoMP (exploratory world-music playground) that serves as the centerpiece of the Music-Play Project housed at Florida State University’s College of Music, children with autism spectrum disorders (ASD) are making impressive gains in creativity, emotional regulation and social participation.

FSU ethnomusicologist Michael B. Bakan likes to call such gains “response-ability.” He’s the director of the innovative medical ethnomusicology program, which uses an array of unusual musical instruments from around the world for improvisational music-play activities that help create a unique therapeutic environment.

“Our program emphasizes ability and personhood over disability and ‘treatment’ and accepts that there are different ways of interacting, just as there are different ways of making music in different cultures,” said Bakan, an associate professor in the College of Music. “The Music-Play Project fosters the growth of response-ability, and in turn, happiness, because it gives children the chance to contribute to the co-creation of culture who too often are characterized as being incapable of doing so.”

Bakan and FSU colleague Benjamin Koen, an assistant professor of ethnomusicology, developed, launched and now oversee the interdisciplinary project in collaboration with researchers at the university’s Center for Autism and Related Disabilities and College of Medicine.

The Music-Play Project welcomes children three at a time to the E-WoMP, where they can choose from among safety-modified world-music options such as Balinese gamelan instruments, a West Javanese angklung (tuned bamboo-tubes rattle), and a West African gyil (xylophone), among many others. Less exotic choices might include homemade shakers, small cymbals and slide-whistles. Soft, colorful rubber swimming-pool dive sticks are used as mallets. Bakan describes all the instruments as “high yield for low input” because they yield satisfying sounds with minimal effort and require little or no technical competence.

Children can freely explore the creative and social possibilities in the E-WoMP on their own terms or with one another, the parent accompanying them, or Bakan and Koen, who as expert improvisers trained in diverse world music traditions, serve as music-play facilitators.

“By supporting a child’s expression and creativity, following instead of leading, responding rather than directing, and integrating instead of teaching, our approach helps children on the autism spectrum in ways that more directive, skills development-based interventions, music-related or otherwise, may not,” Bakan said.

---

**Need student labor? Try the Student Employment Program**

The Career Center wants to remind faculty members to use its free Student Employment Program job board — also known as the “SeminoleLink” — to post part-time departmental job opportunities for students. The Student Employment Program was developed by Florida State University’s Student Government Association, the FSU Office of Financial Aid and The Career Center to connect students and part-time employers, whether they are faculty members, academic departments or off-campus businesses. The Career Center’s goal for the program is to give students a one-stop database to find job opportunities, while also giving employers a larger pool of candidates to choose from.

One benefit to faculty members of the Student Employment Program job board is that they can specify the type of major they are seeking for a given position, according to Jamie Decter, a graduate assistant at The Career Center who coordinates the program. Another benefit is in the advertising of jobs to a wider audience. The Student Employment Program job board is a way to supplement job postings on individual departmental Web sites.

“Faculty members may have part-time positions within their departments that the majority of appropriate student candidates are unaware of,” Decter said. “Many students think of The Career Center as their primary clearinghouse for job opportunities. Therefore, they might not even go to a departmental Web site to look for job opportunities.”

To sign up with the Student Employment Program, employers (faculty members or departments) should visit www.career.fsu.edu, and click on “SeminoleLink.” They should log in under the employer link, and follow the sign-up directions accordingly. If there are problems with the sign-up process, call Decter at 645-6516, or send an e-mail to SEP@admin.fsu.edu.
Tried-and-true: Handwritten essays still as effective as typed

Whether written by hand or typed using a computer, college students’ essays show no significant difference in scores, according to a study produced by the Florida State University Center for Advancement of Learning and Assessment (CALA).

The research, which was funded by the Florida Department of Education, not only examined the effects of handwriting versus typing on the quality of the students’ essays, but also whether variations existed in the scoring of the essays, which could be attributed to one mode of writing or the other.

Graduate and undergraduate students enrolled in Florida’s teacher training programs responded to essay prompts from the Florida Teacher Certification Examinations (FTCE) using both the computer and paper and pencil. Students’ preplanning activities also were captured in both modes. Approximately half of the essays in each mode were transcribed, and both the original and transcribed essays were scored holistically by trained raters. Holistic rater training included a literature review on rater bias and its effect on scoring.

Findings showed no significant difference in scores between the modes, nor was rater bias present. Students tended to do more extensive preplanning for the paper-and-pencil essays than for the computer-typed essays. Even when students did their testing on computer, given a choice, they often preferred planning on paper. There was little correlation, however, between preplanning and the computer-typed essay scores.

“With advances in technology, we are seeing a greater opportunity for cost-saving measures, as well as speed in score reporting,” said Faranak Rohani, the director of CALA. “This study provides empirical support for using the computer-based writing assessment for the essay portion of the FTCE. Certain issues, however, should be considered, such as the quality of rater training and the preference for preplanning on paper.”

CALA, based at the university’s research and development complex, is a pioneer in research and the design of multimedia instructional materials and customized assessments. It seeks and develops alternatives that both inform policy makers and provide practical applications for educators.
Historian’s Arctic research has him standing on TOP of the WORLD

8 • November 17 - December 7, 2008 • STATE

By Barry Ray
NEWS AND PUBLIC AFFAIRS

It’s one of the coldest and most remote areas on Earth, but the Arctic region has long held great strategic interest for a number of nations. Now, a Florida State University researcher is leading an international team that is working to produce one of the most comprehensive histories to date of the northernmost part of the world from the late 19th century to the present.

Ronald E. Doel, an associate professor of history at FSU, is the project leader of “Colon, Empire, Environment: A Comparative International History of Twentieth Century Arctic Science,” a $1.1 million project funded by the European Science Foundation. Nine historians from seven nations — the United States, Canada, England, Norway, Denmark, Sweden and Russia — are working on this innovative research effort.

“What we’re doing is looking at the Arctic from a comparative international perspective,” said Doel, who also has received individual funding from the National Science Foundation’s Office of Polar Programs. “There have been a lot of histories written from one national slice or another — a Canadian history of the Arctic, a U.S. focus, a Russian focus. We have nine members in seven countries, all looking at the Arctic, all talking with one another, beginning to develop a different kind of story that joins the voices together to fill in holes in individual narratives.”

Doel said that he and his colleagues are focusing on how perceptions of the Arctic have changed from the period of colonization to the time of the Cold War, when the region’s military value became one of the main concerns — particularly for the Soviet Union and the United States. The historians’ research will take them all the way up to the modern era, a time of increasing autonomy for some of the Arctic’s indigenous people. (For example, Canada established Nunavut, now the largest of its territories and provinces, in 1999. The new territory’s population is composed mostly of native Inuits.)

Another part of the work that Doel’s team is doing involves the history of science and technology in the Arctic, as well as how people once thought about the environment and how that thinking has changed over time.

“One of the things I often ask my freshmen in class is, ‘When was the first time that the Pentagon got interested in climate change and global warming?’” Doel said. “The brave students say maybe the 1980s; most say the 1990s. But one of the documents we got from the archives shows that one of the first in-depth discussions of polar warming occurred in the Pentagon — it was labeled secret at the time — in 1947. And the concern at that time was not over sustainability or the kind of concerns that motivate many currently, but, rather, national security interests. What happens, for example, if the growing season becomes longer in the Soviet Union? What happens if the harbors are ice-free for many more months out of the year? Will that increase the Soviets’ strength in the world?”

Doel said that one of the more interesting developments to come out of the project has been the rare opportunity for historians to work together.

“Unlike scientific researchers, historians tend to be lone wolves, working in comparative isolation,” he said. “One of the best memories I’ve already taken away from this are the long evening discussions with the Norwegians and

Please see DOEL, 9
the Swedes and Russians, each of us discovering something we never would have been able to know had we been working in our archives back in our home countries. It has been a marvelous collaborative experience and something that we’re hoping to share with our graduate students.”

Members of Doel’s team, who previously met in Greenland, have just returned from a conference in Iceland. Doel hopes that they will have another opportunity to get together at a Russian conference next year. He says the group’s long-term goal is to publish their research in a book that will “join the voices together” to fill in holes in individual narratives.

“Ultimately, I would love to see one of the very first internationally collaborative histories in which authors are able to tell a unified narrative of this fascinating region,” he said. “Of being able to talk about the connections between Arctic researchers in Canada, for example, and how their experiences differed from those in the Soviet Union and other countries at the time. When the United States became interested in the polar regions during the Cold War, what was being discussed in the major capitals of Europe, in Oslo and in Stockholm? We can now get at that by looking at the archives of the major players in this story. And for the first time, historians are able to get together as a group, collaboratively talk about those stories, and produce a narrative. That’s really quite new.”
Research seeks to uncover new cancer therapies with grant

With a four-year, $707,000 grant from the American Cancer Society, Yanchang Wang, assistant professor of biomedical sciences in the Florida State University College of Medicine, hopes to learn how a particular enzyme could possibly help put the brakes on the runaway cell division process that occurs in many forms of cancer.

Wang’s research involves the role of an enzyme known as Cdc14 in deactivating the cell division process set in motion by another enzyme, Cdk1.

“From this proposed experiment, we expect to find a new way to regulate cell division,” Wang said. “Cdk1 is the key driving force for cell division, so it’s quite important.”

The enzymes Wang is studying are part of the cellular signaling processes that protect genes and chromosomes when cells divide, ensuring that the number of chromosomes in each new cell is precisely correct. This process is critical in that an abnormal number of chromosomes can lead ultimately to cancer.

Wang conducts his experiments on yeast because it abides by the same regulatory processes during cell division as human cells.

“Yeast is a single cell, but it is really powerful and it will answer different kinds of biological questions, especially for the regulation of cell division,” Wang said.

With the addition of this grant, Wang has now attracted more than $1.3 million in external research funding since arriving at the Florida State University College of Medicine in 2003 as one of the first faculty recruited to the college’s department of biomedical sciences.
the central goal of stem cell therapy, which is to successfully convert adult tissue back to an embryo-like state so that it can be used to regenerate or replace damaged tissue. Such therapies hold out hope of treatments or cures for cancer, Parkinson’s disease, multiple sclerosis, spinal cord injuries and a host of other devastating disorders.

Using mouse and human embryonic stem cells, FSU researchers employed advanced imaging techniques and state-of-the-art genomics technology to demonstrate, with unprecedented resolution along long stretches of chromosomes, which sequences are replicated first, and which occur later in the process of differentiation.

“Understanding how replication works during embryonic stem cell differentiation gives us a molecular handle on how information is packaged in different types of cells in manners characteristic to each cell type,” said David M. Gilbert, the study’s principal investigator. “That handle will help us reverse the process in order to engineer different types of cells for use in disease therapies.” Internationally renowned for his body of cutting-edge research on chromosomal structure and reproduction that he began as a doctoral student at Stanford University in the 1980s, Gilbert joined the FSU faculty and was appointed as the first J. Herbert Taylor Distinguished Professor of Molecular Biology in 2006.

Results from the FSU study, which includes contributions from researchers at three other institutions, are described in a paper published in the October 7, 2008, edition of *PLoS* (Public Library of Science) Biology, a peer-reviewed journal that showcases biological science research of exceptional significance. So prodigious were the findings that the current paper — “Global Reorganization of Replication Domains During Embryonic Stem Cell Differentiation” — is focused solely on results observed in the mouse embryonic stem cells; data on the human cells will be detailed in a future report.

“We know that all the information (DNA) required to take on the identity of any tissue type is present in every cell, because we already can, albeit very inefficiently, create whole animals from adult tissue through cloning,” Gilbert said. “We also can make a kind of artificial embryonic stem cells, called induced pluripotent stem cells, out of many adult cell types, but there are two major hurdles remaining. First, the methods currently used rely on the unnatural retroviral insertion of genes into patients’ cells, and these genes are capable of forming tumors. Second, this method is very inefficient as well because only one in 1,000 cells into which the genes are inserted becomes pluripotent. We must learn how cells lose pluripotency in the first place so we can do a better job of reversing the process without risks to patients.

“The challenge is, adult cells are highly specialized and over the course of their family history over many generations they’ve made decisions to be certain cell types rather than others,” he said. “In doing so, they have tucked away the information they no longer need on how to become other cell types. Hence, all cells contain the same genetic information in their DNA, but during differentiation they package it with proteins into ‘chromatin’ in characteristic ways that define each cell type. The rules that determine how cells package DNA are complicated and have been difficult for scientists to decipher.”

But, Gilbert noted, one time that the cell “shows its cards” is during DNA replication.

Kristine Harper

Harper points to the crucial contributions of Carl-Gustav Rossby, founder of the Massachusetts Institute of Technology’s meteorology program and a member of the renowned “Scandinavian tag team” of meteorologists who worked with von Neumann. (In 1945, von Neumann had settled on weather prediction as a suitably difficult scientific problem amenable to a numerical solution to showcase the capabilities of his proposed computer.) The team’s transformation of the discipline, Harper writes, was the most important intellectual achievement of 20th-century meteorology and paved the way for the growth of computer-assisted modeling in all of the sciences.

“Having spent many years working with these models as a meteorologist, discovering their history was a fascinating experience,” she said.

While “Weather by the Numbers” is Harper’s first academic book, it promises not to be her last. She is currently writing another book on the use of weather control as a tool of the state in mid-20th-century America. Like “Weather by the Numbers,” it will address issues related to the history of science and technology, and environmental history.

“Because of my background in meteorology and oceanography,” Harper said, “I continue to be drawn to historical topics that draw on my scientific expertise and have the potential to inform policy decisions in the 21st century.”
Over the history of Florida State University, six Nobel Laureates have served on the faculty. Now these remarkable scholars have been immortalized with bronze busts by the university’s Master Craftsman Program at the direction of Provost and Executive Vice President for Academic Affairs Lawrence G. Abele.

After the Fall Meeting of the General Faculty adjourned on Oct. 31, Abele ceremonially unveiled the busts along the breezeway that connects the College of Medicine to the Department of Psychology.

**Florida State’s former Nobel Laureates**

- **Paul Adrien Maurice Dirac**, 1902-1984: Dirac was an outstanding theoretical physicist whose work was fundamental to the development of quantum mechanics and quantum electrodynamics. He was awarded the Nobel Prize in Physics jointly with Erwin Schrödinger in 1933 for contributions to atomic theory.

- **Robert Sanderson Mulliken**, 1896-1986: Mulliken, a physicist and chemist, brought Florida State University its first Nobel Prize. While serving as Florida State University Distinguished Research Professor of Chemical Physics from 1964 to 1971, Mulliken was awarded the 1966 Nobel Prize in Chemistry for his work on molecular orbital theory in computing the structure of molecules. Mulliken was also Distinguished Professor of Physics and Chemistry at the University of Chicago.

- **Konrad Emil Bloch**, 1912-2000: Bloch was co-recipient with Feodor Lynen of the 1964 Nobel Prize in Medicine or Physiology for discoveries concerning the mechanism and regulation of the cholesterol and fatty acid metabolism — how cholesterol is made in the body.

- **James M. Buchanan**, 1919-: Buchanan taught at Florida State University from 1951 to 1956. An economist renowned for his work on public choice theory, Buchanan won the 1986 Nobel Memorial Prize in Economic Science for his development of the contractual and constitutional bases for the theory of economic and political decision-making.

- **John Robert Schrieffer**, 1931-: Schrieffer won the 1972 Nobel Prize in Physics, with John Bardeen and Leon Neil Cooper, for developing the first successful microscopic theory of superconductivity.

**Florida State’s current Nobel Laureate**

- **Sir Harold W. Kroto**, 1939-: Kroto, one of the co-recipients of the 1996 Nobel Prize in Chemistry, has been Francis Eppes Professor in Florida State University’s Department of Chemistry and Biochemistry since 2004. With Richard Smalley and Robert Curl, he was responsible for the Nobel-winning discovery of Buckminster-fullerenes or “buckyballs” — molecules consisting of 60 carbon atoms in the shape of a soccer ball.