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to identify genes that control the size of the meristem. They discovered a mutation of these genes, known as *ELONGATED EAR2 (FEA2)*, that results in a larger meristem. Plants grown with the *FEA2* mutation produce ears of corn that have a greater number of rows and up to 13% more kernels than their normal counterparts. In other experiments, Jackson and colleagues identified another mutant gene, known as *COMPACT PLANT2 (CT2)*, that also regulates the size of the meristem. The team explored the molecular mechanism of these mutations and discovered that *CT2* encodes for a protein known as G that unexpectedly interacts with *FEA2*, an unusual type of cell-surface receptor. Deep understanding of these natural mutations and their impact on plant growth points the way to higher maize yields. Good news if we are to meet the planet's ever-growing needs.

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There are two major classes of neurons in the cerebral cortex: excitatory and inhibitory. Assistant Professor Adam Kepecs and his team are working to understand how signaling between these neurons shapes mental processes such as cognition and learning. This year, Kepecs and his team identified the role of a special class of inhibitory neurons, known as VIP neurons, in the cortex. In collaboration with CSHL Professor Jo



In recent years, next-generation sequencing has brought genome-wide data to clinical research, paving the way for major new discoveries in the diagnosis and treatment of disease. Despite this promise, there has been some signiP

of genetic experiments revealed that the presence or absence of one variant type of p63 protein, called TAp63, determines whether or not a child with the mutation will actually develop EEC pathology. Loss of TAp63 alone does not cause EEC. But when mice lacking TAp63 also possess the E63 gene mutation, pathology always occurs. This work suggests that in children who have inherited the EEC-causing mutation from one of their parents, levels of the TAp63 protein determine whether to what extent these children will be born with birth defects. Mills speculates that if levels of TAp63 drop beneath a certain threshold, it is no longer protective, opening the way to pathology. The next step for researchers in this area is to compare the DNA of children only mildly affected by EEC with siblings or other children who have a severe form of the disease.



An orange and a grapefruit have quite similar odors; at the same time, they are both sweet and acidic. Despite the similarity, our brains can readily differentiate between the two. Assistant Professor Glenn Turner and colleagues have made significant advancements this year using the fruit fly olfaction system to identify how the brain distinguishes one scent from another. The fruit fly brain has a structure called the mushroom body that is responsible for learning and memory, including olfaction. Within the mushroom body are neurons called Kenyon cells. Turner's team identified a specific neuron that is responsible for distinguishing between the two scents. This neuron is called the "orange neuron" and is located in the mushroom body. The researchers found that this neuron is highly sensitive to the scent of oranges and is less sensitive to the scent of grapefruit. This finding provides a molecular basis for the brain's ability to distinguish between these two scents.

from CSHL Trustee James M. Stone, Ph.D., and CSHL Trustee Michael R. Botchan, Ph.D. Chairing the SAC is Fred Alt, Ph.D., of Harvard University Medical School. Other members include Drs. Cori Bargmann, Joanne Chory, Carol Greider, Leonid Kruglyak, Markus Meister, Kevan Shokat, and Max Wicha.



As CSHL's employee numbers and operating budgets have grown in the decade of the millennium, so have opportunities for commercialization of our research discoveries and technologies. This year, CSHL announced the recruitment of Teri Willey to the new position of Vice President, Business Development and Technology Transfer. Teri brings a wealth of experience from leading transfer and business development for Mount Sinai Medical Center and the founding of several ventures including Cambridge Enterprise Ltd. and ARCH Development Partners.

John Maroney, who for the past 20 years has helped many CSHL investigators launch successful technology start-ups and negotiate licensing agreements, continues in

📱 *Highlights of the Year*

memory of his son who died of cancer, helping to set the stage for CSHL's Cancer Therap

CSHL is extending the reach of its science education programs to urban centers all over the world. A new outreach center in Manhattan will serve as the nucleus for DNA learning in New York City. Middle and high school students will have access to hands-on DNA laboratory experiences to gain a greater understanding of their own uniqueness, the implications of personalized medicine, and their shared genetic heritage in America's melting pot. The NYC center has been

*Highlights of the Year*

This year, DHMD also highlighted the impact that CSHL has had in leveraging biomedical technology for applications to benefit



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## Highlights of the Year

This past year, some 20,960 students made field trip visits to DNA Learning Center (DNALC) facilities in Cold Spring Harbor, Lake Success, and Harlem. An additional 10,200 students were reached through in-school instruction by DNALC staff. There were also 1640 in-school lab exposures via mobile Bootlocker Kits used by teachers in their own schools. These teachers previously received specialized DNALC training.

During the summer, 60 week-long biology and genetics summer camps were held in Cold Spring Harbor and eight other locations in New York, Massachusetts, and Connecticut, drawing a record 1240 students. Monthly *Saturday DNA!* sessions drew hundreds more children, parents, and grandparents.

At its main facility in Cold Spring Harbor, the DNALC this year updated museum space that

With its beginnings in the first annual meeting, in 1933, of the Cold Spring Harbor Symposium on Quantitative Biology, this scientific conference series still going strong. The Meetings & Courses program in the last year attracted more than 11,600 participants. This included upwards of 7200 individuals who attended scientific meetings and more than 1300





the fifth meeting in the Genentech Center series on the history of science. Herb Boyer, Stu Linn, and Rich Roberts, pioneers in the field of restriction enzymes, were co-organizers, bringing together scientists involved in the discoveries and research on restriction enzymes dating back to the 1950s and covering developments to the present time.

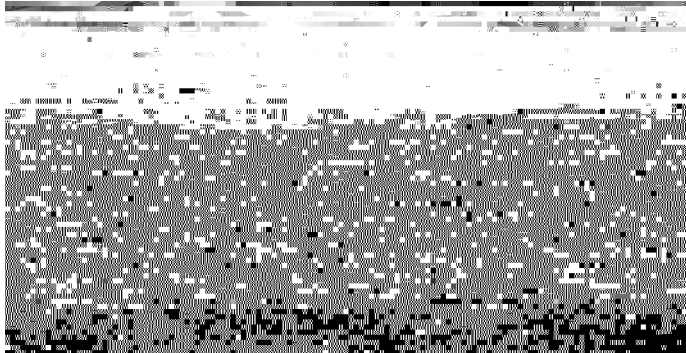
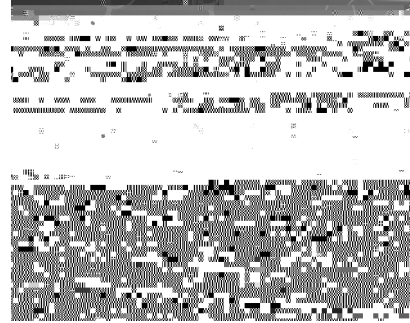
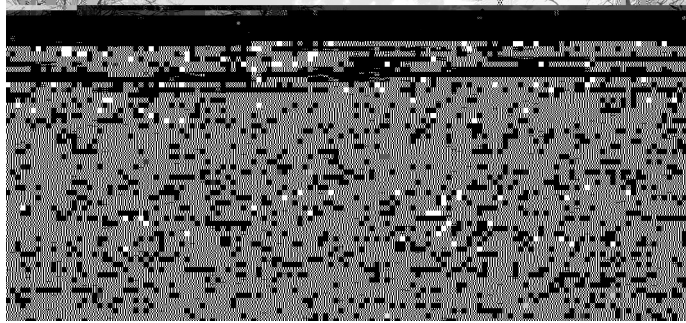
The Archives participated in several events, displaying elements from various CSHL collections:

- ¥ **Alfred Day Hershey Collection** Materials from the Alfred Day Hershey Collection were displayed at the Scottish Parliament in an exhibit about the philanthropic legacy of Andrew Carnegie, on display from 14 October 2013 until 25 January 2014.
- ¥ **Extraordinary Women in Science & Medicine** A landmark public exhibition, *Extraordinary Women in Science & Medicine: Four Centuries of Achievement*, held at the prestigious Grolier Club in New York City from September 19 to November 13, 2013, showed materials from the Barbara McClintock Collection, including photos, landmark papers, and a corn cob from the 1960s loaned by CSHL Professor Rob Martienssen.
- ¥ **From Base Pair to Body Plan: Celebrating 60 years of DNA** Display of more than 200 images related to the Laboratory's history and its science was a central part of the meeting *From Base Pair to Body Plan: Celebrating 60 Years of DNA*









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involved, as students, friends, and neighbors. During a continuously running series of 5-Minute Science Talks, CSHL postdoctoral researchers engaged audiences throughout the afternoon on topics from "Why haven't we cured cancer?" to "Molecular photography." Videos of these talks are available on YouTube. Free minitours of the campus led by graduate students and Lab postdocs

the Walk started in 2004, CSHL has received more than a quarter of a million dollars for cancer research from LI2DAY.

This year, CSHL Associate Professor Raffaella Sordella joined in the Swim Across America (SAA) Sound to the Cove Swim at Morgan Park in Glen Cove. Dr. Sordella received \$70,000 from SAA for her research aimed at ways to overcome resistance to targeted therapies for non-small-cell lung cancer. Dr. Sordella credited the support she has received from SAA as \$420,000 to date in providing critical resources to identify a population of cells in lung tumors that are intrinsically resistant to therapy.

CSHL Chief Operating Officer

Now we are completely different, wrote Jim, looking back on what he had accomplished since taking on the challenge of leading CSHL in 1968. The science we do, the demanding excellence of our courses and meetings, and the high quality of our publishing program convey to the world outside the aura of a quality postgraduate university. We worry not about becoming good, but instead on how to ensure that we continue to carry out science at the highest possible level (19 CSHL Annual Report). We thank Jim and Liz for their continuing dedication to the Laboratory and its continued success. The

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