HARBOR TRANSCRIPT
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Cold Spring Harbor Laboratory
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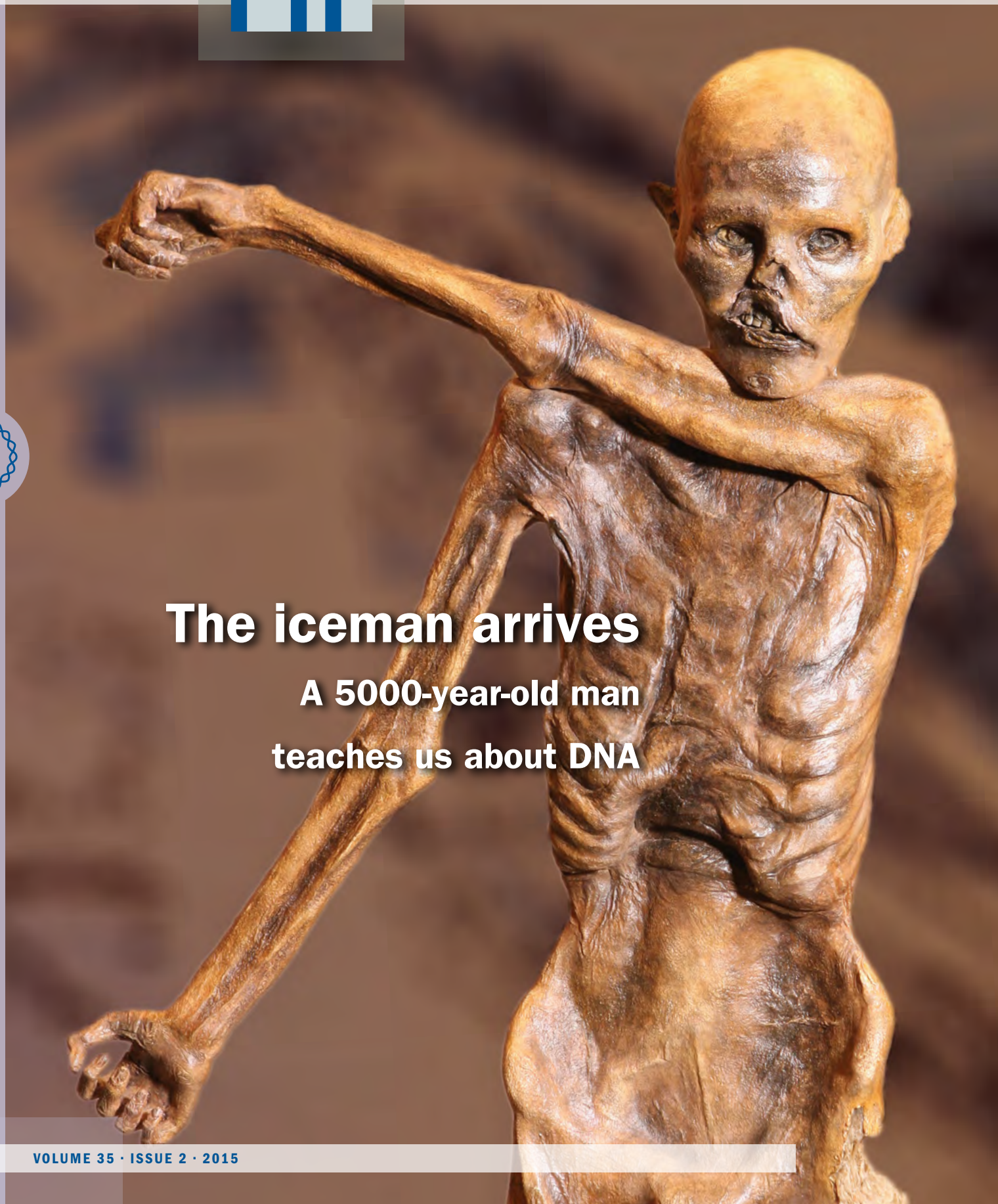

The iceman arrives

A 5000-year-old man teaches us about DNA

VOLUME 35 · ISSUE 2 · 2015

Cold Spring Harbor Laboratory

PRESIDENT'S MESSAGE

This edition of *Harbor Transcript* highlights some of our latest research results as well as events and people who supported Cold Spring Harbor Laboratory this year—the year of our 125th anniversary. Throughout its storied history, CSHL has helped shape modern science through discoveries in cancer, plant biology, neuroscience and quantitative biology. This foundation has positioned CSHL as one of the top research and science education institutions in the world.

Progress in research depends on conceptual breakthroughs, technological leaps, firm financial backing and hard work by scientists who are passionate about what they do. Advances cannot be predicted, and sometimes serendipity is a real factor in our movement forward. Importantly, private philanthropy is crucial for launching the most innovative and risky research programs—those that are not mainstream enough to be considered for federal grants.

Thanks to the Board of Trustees, we have successfully raised 75 percent of the philanthropic funds for our 125th Anniversary Capital Campaign. The goal is to raise at least $250 million for key near-term initiatives to strengthen and evolve our research and education programs:

- Endow the President's Research Fund that supports scientists pursuing the most innovative research projects.
- Build a new Center for Nutrition and Cancer Metabolism that furthers our Cancer Therapeutics Initiative.
- Open a large DNA Learning Center in New York City to advance biology education for youths throughout the metro area.
- Endow a Distinguished Visiting Professorship and student fellowships to enhance the training of our Ph.D. students.
- Endow the Archives to disseminate knowledge born at CSHL through scholarships, exhibitions, and multimedia.

In this magazine you will see many examples of CSHL's innovative spark in research and education. I ask that you help turn that spark into a triumph by contributing to the 125th Anniversary Capital Campaign. With your support, CSHL discoveries will shape a brighter future for us all. You can keep the fire burning brightly.

Bruce Stillman

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Public Affairs
One Bungtown Road
Cold Spring Harbor, NY 11724

516.367.8455
publicaffairs@cshl.edu

www.cshl.edu

V.P. Communications:
Dagnia Zeidlickis
Managing Editor:
Phil Renna
Science Writers:
Chris Palmer
Peter Tarr
Design & Layout:
Margot Bennett
Photography:
Robert Giglioner: front cover, 13;
Charles Camarda: inside front cover;
Courtesy Trotman lab: 1, 8-9
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Double Helix Medal 10th anniversary awardees (l–r) with President Bruce Stillman: Katie Couric; David Botstein; Anne Wojcicki.

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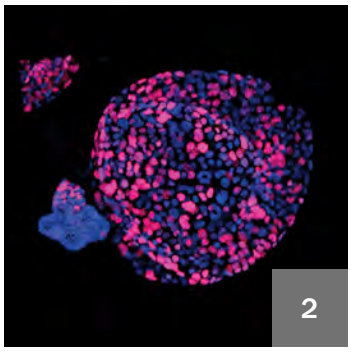
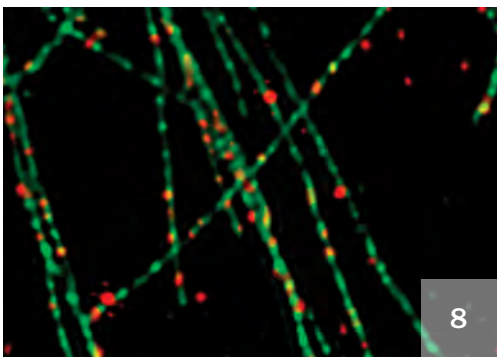


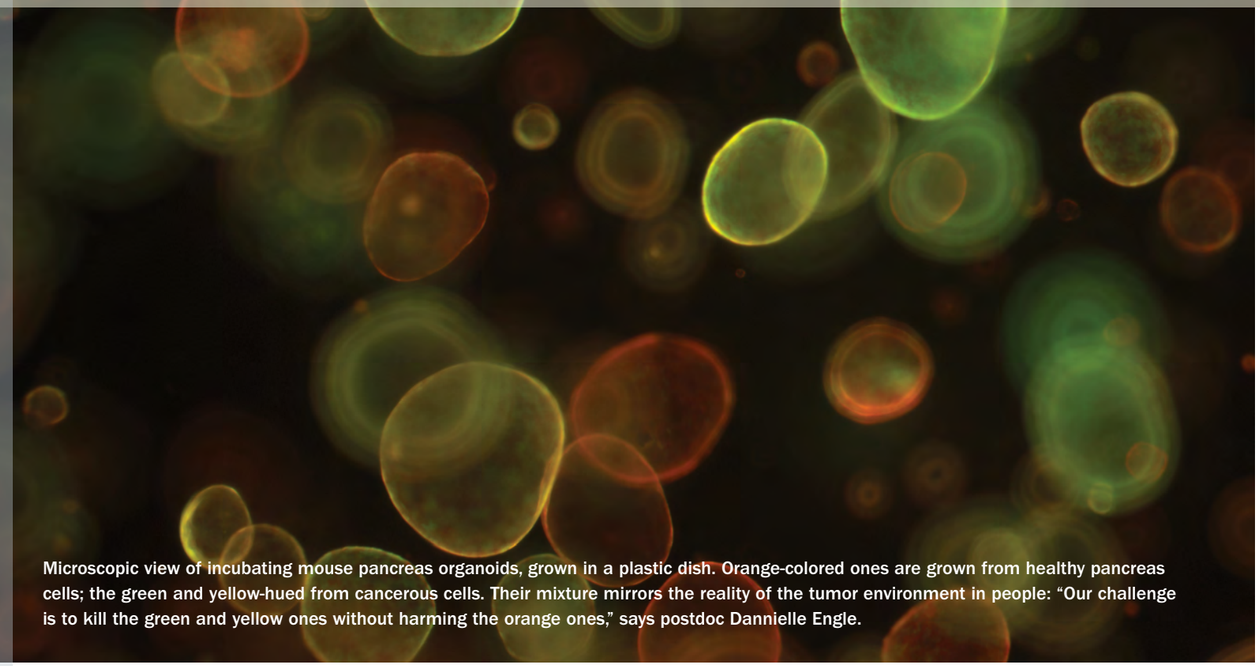


FEATURES

FACULTY & FRIENDS

On the cover and on the web:
Ötzi's arrival at the DNA Learning Center in Cold Spring Harbor village opens a new hands-on science program to 30,000+ middle and high school students in the region who visit each year. Since 1988, the DNA Learning Center has been teaching students, teachers and families about genetics through partnerships with public and private schools, *Saturday DNA!* sessions for families, and week-long summer camps. Ötzi is just one example of the innovative educational programs and resources available through the DNA Learning Center at various locations across Long Island and in Manhattan as well as online. CSHL's educational outreach program is a model for science education across the country and around the world, most recently in China. Visit **dnalc.org**

Cancer research in 3D



Microscopic view of incubating mouse pancreas organoids, grown in a plastic dish. Orange-colored ones are grown from healthy pancreas cells; the green and yellow-hued from cancerous cells. Their mixture mirrors the reality of the tumor environment in people: “Our challenge is to kill the green and yellow ones without harming the orange ones,” says postdoc Dannielle Engle.

Suspended in a gelatin infused with growth factors, small clusters of cells extracted from a cancer-stricken pancreas divide and grow, extending upward and outward. Slowly, shapes take form—spheres whose outer surface is composed of a single layer of cells, each filled with a slurry of all the protein building blocks and nutrients necessary for growth.

These three-dimensional balls of cells, called organoids, are providing researchers and clinicians with a desperately needed tool for creating personalized treatments against pancreatic cancer. They may also help diagnose the deadly disease years before current methods can.

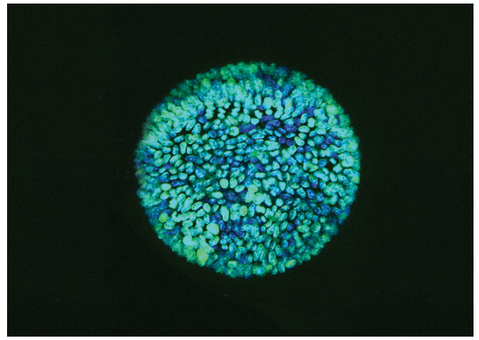
With only 6 percent of patients surviving 5 years beyond their diagnosis, pancreatic cancer is one of the deadliest cancer types. And because half of patients die within 6 months of diagnosis, it’s also one of the more challenging to research.

“When patients get the diagnosis, it’s usually very late in the course of the illness,” says Dr. David Tuveson, CSHL Professor and Director of Research for the Lustgarten Foundation. “It’s hard to study because patients don’t live long enough to participate in clinical trials.”

All cancer research relies on a steady supply of cells—both normal and cancerous. By comparing normal cells to cancer cells, scientists can identify the changes that lead to disease—information useful in developing effective therapies. In many cancer types, researchers obtain cells during surgery or autopsy. But since 85 percent of pancreas cancer patients are ineligible for surgery at the time of diagnosis, there are few opportunities to obtain tissue to study in the lab.

When researchers do get their hands on pancreatic cancer cells, growing them in plastic Petri dishes and testing potential drugs against them has provided flashes of hope, but the results have ultimately disappointed. “We’re very good at killing those cells in culture dishes, but once we try to kill those same cells in the patients, we find that their tumors are much more complicated,” says Dannielle Engle, a postdoctoral researcher in Tuveson’s lab.

Pancreatic tumors are comparatively complex. Only 10 percent is composed of cancer cells; the rest is a combination of fibroblasts (cells that give structure to tissue), blood vessels, and immune cells. This mix forms a “stromal shell” that can be hard for drugs to penetrate. Looking to test therapies on a more representative model of pancreatic tumors, including the confounding stromal shell, Tuveson turned to organoids.



This organoid mimics a very aggressive form of pancreas cancer. The blue-green color in virtually every cell signals cell division—a hallmark of cancer.

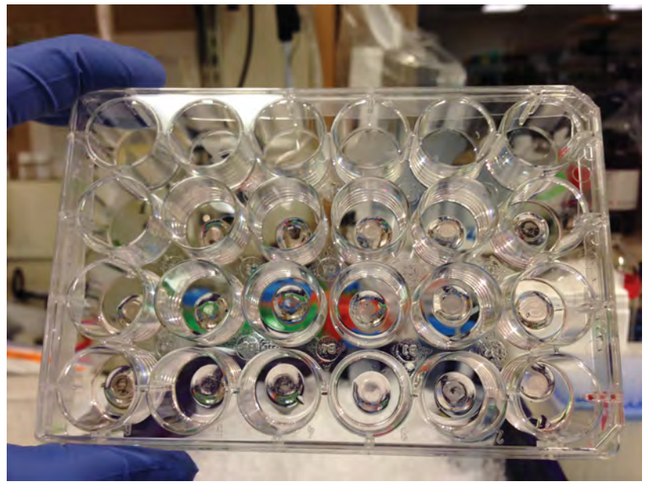
In his former position at Cambridge University in the UK, Tuveson struck up a friendship with Dutch researcher Hans Clevers, who developed a general technique for creating organoids. “I take care of patients with pancreatic cancer,” explains Tuveson, “and I was just sick and tired of watching everything going so slowly towards helping individual patients.” He collaborated with Clevers to perfect a method of fabricating organoids from pancreatic cells.

Creating enough organoids to test a variety of drugs for an individual patient takes about two weeks. Tuveson and his team obtain cell samples from patients—either during surgery or a needle biopsy. Then they cultivate the cells into dozens of the spherical 3D tumor facsimiles. Once developed, the organoids are transferred into the pancreas of several mice and allowed to form tumors, providing the team with a chance to simultaneously test different therapies. They probe the organoids to identify molecular pathways contributing to their growth and try to target those pathways with various drugs to see if survival rates improve.

In addition to deriving personalized therapies for patients, organoids can be used to identify biomarkers—molecular signatures of disease that can aid diagnosis. “Before, when you grew these cells in a dish, you could only grow fully cancerous cells,” says Engle. But with organoids, each stage of the cancer can be grown. Studying differences across organoids from many patients could help identify reliable biomarkers. “This would give us a way of finding pancreatic cancer early enough that more patients would be eligible for surgery,” says Engle.

Because patients live on average only 6 months past their diagnosis, pancreatic cancer has been viewed as an incredibly fast-moving disease. However, two recent studies suggest that the progression from the cancer’s initiating events to an overt malignancy can take more than 10 years. After that, spread throughout the body can take another 5–7 years. “That means we have at least a decade to find these tumors before they spread,” says Lindsey Baker, a postdoc who has worked closely with Tuveson, Engle and others to make organoids a tool that might help change the prognosis for pancreas cancer patients.

Chris Palmer



A plate with 24 “wells” in which pancreas organoids are grown. The tiny spheres can be discerned within the dome-like gels at the center of each well.

From lab bench to bedside

Researchers and clinicians team up

Cold Spring Harbor Laboratory and the North Shore-LIJ Health System* this year announced a strategic affiliation to bring the cutting-edge basic discovery science and translational cancer research at CSHL to one of the largest cancer treatment centers in the United States. The unique integration of research scientists, clinical translational researchers and cancer clinicians promises to speed the advance of novel cancer diagnostics and therapeutics to patients in the region.

An early example of the power of this affiliation is the collaboration between CSHL Professor and Deputy Cancer Center Director David Tuveson, M.D., Ph.D. (right), and NSLIJ Hematology/Oncology Acting Chief Craig Devoe, M.D. (left). Together, the scientist and physician care for this pancreatic cancer patient, Gail Poinelli, leveraging the latest clinical advances and academic research insights.

"Bringing the scientists of CSHL together with the more than 200 academic oncologists and clinicians of the North Shore-LIJ Cancer Institute will transform our approach to cancer research and treatment throughout the New York area," says North Shore-LIJ President and CEO Michael Dowling. "North Shore-LIJ oncologists will make CSHL's promising pre-clinical research available as innovative trials to select cancer patients at a much earlier stage, building on the clinical and translational research programs the health system has been offering its patients for more than 30 years and establishing our Cancer Institute as a destination for pioneering cancer therapies."

*The North Shore-LIJ Health System is changing its name to Northwell Health starting January 2016.

Dagnia Zeidlickis

Double Helix Medals Dinner

Amid the bones of dinosaurs and under the belly of a 94-foot blue whale, Cold Spring Harbor Laboratory celebrated the 10th year of the Double Helix Medals Dinner at the American Museum of Natural History. While the setting reminded the 425 guests of how our world has evolved over the millennia, the centerpiece of the evening was contemporary biology and genetics research—our greatest hope for a bright future.

Following previous medal winners who include Muhammad Ali, Craig Venter, Michael J. Fox, John Nash, Temple Grandin and Robin Roberts, this year's medals went to:

Journalist, TV personality, & cancer advocate
KATIE COURIC

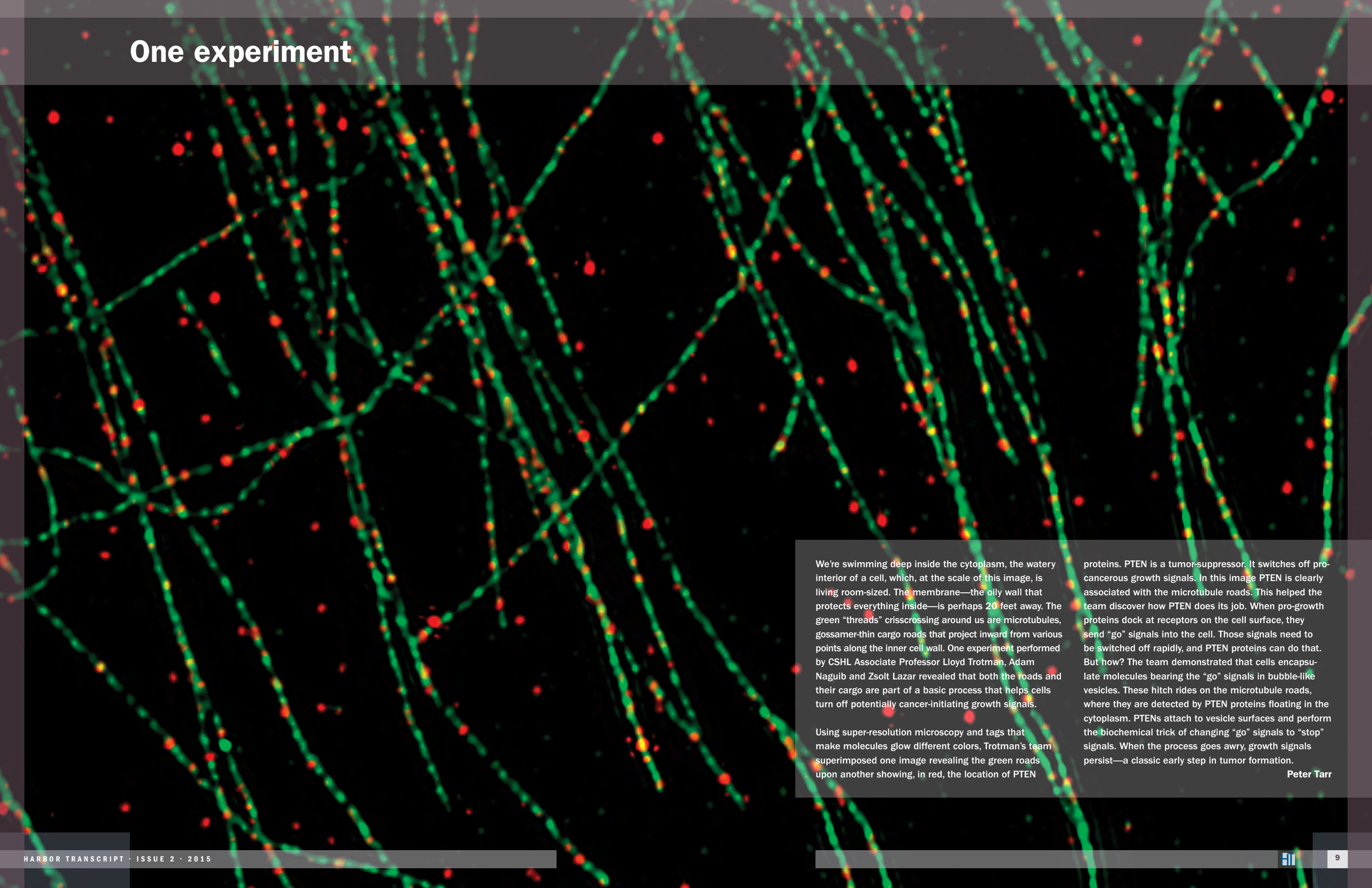
Co-founder & CEO of 23andMe
ANNE WOJCICKI

Pioneer in gene mapping
DAVID BOTSTEIN

These esteemed individuals have dedicated their lives to raising awareness of the importance of genetic research for improving the health of people everywhere. Over the last decade, this New York City gala has raised more than $35 million for research and education programs at CSHL. Thank you to all who supported this event.

Visit www.cshl.edu/dhmd for images and videos.

One experiment



We're swimming deep inside the cytoplasm, the watery interior of a cell, which, at the scale of this image, is living room-sized. The membrane—the oily wall that protects everything inside—is perhaps 20 feet away. The green "threads" crisscrossing around us are microtubules, gossamer-thin cargo roads that project inward from various points along the inner cell wall. One experiment performed by CSHL Associate Professor Lloyd Trotman, Adam Naguib and Zsolt Lazar revealed that both the roads and their cargo are part of a basic process that helps cells turn off potentially cancer-initiating growth signals.

Using super-resolution microscopy and tags that make molecules glow different colors, Trotman's team superimposed one image revealing the green roads upon another showing, in red, the location of PTEN proteins. PTEN is a tumor-suppressor. It switches off pro-cancerous growth signals. In this image PTEN is clearly associated with the microtubule roads. This helped the team discover how PTEN does its job. When pro-growth proteins dock at receptors on the cell surface, they send "go" signals into the cell. Those signals need to be switched off rapidly, and PTEN proteins can do that. But how? The team demonstrated that cells encapsulate molecules bearing the "go" signals in bubble-like vesicles. These hitch rides on the microtubule roads, where they are detected by PTEN proteins floating in the cytoplasm. PTENs attach to vesicle surfaces and perform the biochemical trick of changing "go" signals to "stop" signals. When the process goes awry, growth signals persist—a classic early step in tumor formation.

Peter Tarr

RESEARCH PROFILE

Adam Siepel

In the 6 million years since humans diverged from chimps, the two species have remained astonishingly similar at the level of genes. Modern humans have only a handful of protein-encoding genes—from among the total set of about 21,000—that chimps don't have. The full set of proteins that humans and chimps make is almost identical.

What then makes people and chimps so different? It's one of several profound questions addressed in the wide-ranging research of Professor Adam Siepel, a quantitative biologist who uses advanced mathematics and analytical tools developed in disciplines ranging from computer science to physics and engineering to extract meaning from data collected in biological experiments. Using these tools, Siepel and colleagues have demonstrated, for instance, that it's not so much our genes, but the way they're regulated that distinguishes us from the great apes.

Siepel, 43, came to Cold Spring Harbor Laboratory from Cornell University in 2014 to lead the Simons Center for Quantitative Biology. The SCQB, launched with a $50 million donation by Jim and Marilyn Simons (see box, p. 12), had been gaining critical mass since 2009.

"I came to the Lab because it's a tremendous opportunity to do quantitative biology (QB) shoulder-to-shoulder with leaders in experimental biology," Siepel explains. Professor Mike Wigler, an early champion of a QB center, pointed out years ago that "we will all benefit from having very smart people at the Laboratory" like Siepel, with "deep insights into mathematics and the structure of things, including large data sets."

A hacker at age 12

Siepel is a member of the first generation raised with home computers. "I became a hacker at around age 12, and started writing video games." From his home town, West Valley, an hour from Buffalo in western New York, it was off to Cornell for engineering and then to Los Alamos National Laboratory, for his first chance to use advanced computers to answer biological questions—in this case, figuring out how HIV, the AIDS virus, evolved. It was 1994, and "I was immediately captivated."

He later earned a Ph.D. at the University of California, Santa Cruz, then returned to Cornell to teach, distinguishing himself in research focused on comparative genomics and the development of statistical methods and software tools to understand how genomes evolve.

Tracing the human genome's evolution is a fascinating intellectual and technical challenge. Siepel says it is also of practical value. "If you're going to try to associate mutations in DNA with diseases, like cancer, you need to understand—as background—the process by which mutations are propagated through populations in the *absence* of disease."

In other words: "In order to ask questions about 'what is surprising?' when you compare people who are sick and those who aren't, you have to have a really good model for what is not surprising." One needs to know what scientists call the "null case"—the kind of mutations you expect to see when DNA acts like DNA does in normal situations.

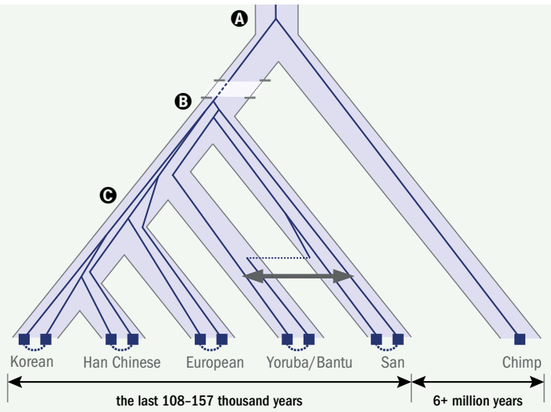
The average rate of human mutation is about 1 per 100 million DNA "letters," every generation. Since there are 3 billion letters in our genome, each of us has about 30 DNA letters that differ from the corresponding ones in our parents' genomes. Yet, Siepel and his team have asked: how can we know which of them, if any, actually matter?

Having DNA variants linked with a serious illness like autism or heart disease changes one's risk profile. But Siepel's inquiries have taken the question of a mutation's significance to an even deeper level. His research group invented a mathematical method, called INSIGHT, to predict which DNA letters in a given genome are important to evolution. By that, they mean which DNA mutations are likely to affect fitness. It involves comparing DNA changes among dozens of contemporary people with chimps, our closest relatives. Patterns of variation across these human and nonhuman individuals allow them to home in on the DNA letters that actually matter. "INSIGHT enables us to use these patterns to separate the important mutations from the ones that are likely not doing anything."

The analysis is complex, but the bottom line is simple and stunning: "Most of the mutations you see in present-day human populations have no impact whatsoever on fitness," Siepel says. Those that have an impact tend to disappear rapidly—they're either so advantageous that they are universally adopted and therefore lose their identity as mutations, or, much more often, they are harmful and vanish rapidly. Some human mutations result in a nonviable fetus, for example.

Siepel's team has also used an evolutionary perspective to shed new light on fundamental biological mechanisms. For instance, the regulation of gene transcription—the process by which a gene's coded message is copied into RNA. The process was described in great detail decades ago, from the activation of genes, to the "reading" of DNA by protein machines called DNA polymerases, to the generation of RNA messages, called transcripts. Yet research published last year by Siepel and colleagues, including his longtime collaborator John Lis at Cornell, gave evidence of several things not previously suspected.

First, it turns out that not only are the long DNA passages that "spell out" genes being "read" and "transcribed" into messages; so are shorter DNA regions that *regulate* genes, called enhancers and promoters. (Different combinations



Our demographic history

Where do we come from? Our genomes are the product of many ancestral genomes, shuffled through generations of genetic recombination. Siepel's team devised methods to estimate when various current populations branched off from one another, long after the great human-chimp divergence about 6.5 million years ago (Ⓐ in chart). Genomes of 6 living people, representing, San, Yoruba, Bantu, European, Han Chinese and Korean populations, were compared with one another and a chimp genome. The San occupy the oldest existing branch of our common family, having diverged 108–157 thousand years ago (Ⓑ). Europeans and Asians diverged from common African ancestors (represented here by Yoruba and Bantu peoples) 38–65 thousand years ago (Ⓒ). The data also suggest the original human ancestral group numbered ~ 9000 people. (Adaptation of figure by Siepel and colleagues)

Our closest relatives, in evolutionary terms.

of promoter and enhancer activity help explain why some genes are active only in specific cell types.)

The second revelation is that this process of reading, copying and writing RNA messages proceeds in opposite directions, simultaneously, on the twin DNA strands—at genes, enhancers and promoters alike. All this message-making raises a problem: how does the cell end up with stable RNA messages that tell the cell how to make proteins? What happens to all those additional messages being generated at enhancers and promoters? These messages fall away from the double helix, the team recognized, and are quickly destroyed.

This adds up to what Siepel calls a "unified model" for how DNA transcription is initiated. Why does it matter? It simplifies: "We found that the same process of RNA message making gets applied not only at genes but also at the regulatory elements." Moreover, the mechanism is useful—for the well-being of the individual *and* the species. RNA messages that regulate gene expression are made and then destroyed. The only surviving message is that of the gene. This is what the cell needs to make a protein. The entire machinery tends to ensure that proteins are made, made properly, and only when they are supposed to be made.

Another significance of the work concerns how these facts were ascertained. It involved some ingenious tagging of RNAs that Dr. Lis invented. It also depended upon a massive compilation and sorting of data, drawing upon the vast data set of the Encyclopedia of DNA Elements, or ENCODE (a consortium in which CSHL Professor Thomas Gingeras plays a lead role). It also pivoted upon the ability of Siepel's team to build a model that explained how to distinguish between long- and short-lasting RNA messages.

Both examples of Siepel's recent research shed light on gene regulation and help answer many questions, including the mystery of what makes men and chimps different. The work shows that while only a small part of today's genome has been under evolutionary "selection pressure," it is changes in factors like enhancers and promoters that *regulate* genes, and not in genes themselves, that appear to account for much of the difference.

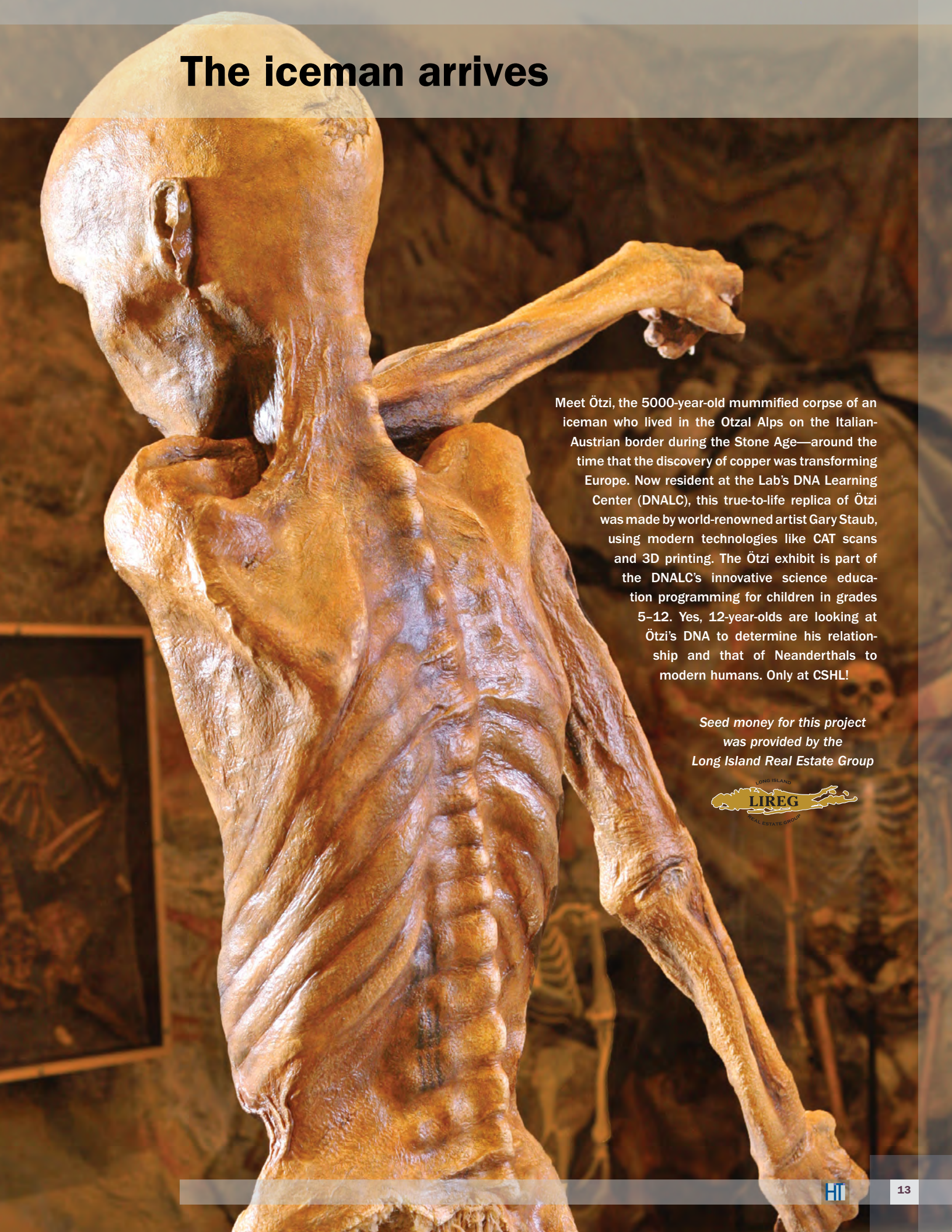
Peter Tarr

A transformative gift

The 2014 gift to the Lab of $50 million from Marilyn and Jim Simons to establish the Simons Center for Quantitative Biology (SCQB) was only the most recent in a long and fruitful series of the couple's philanthropic acts, many focusing directly on support of math and basic research.

"I became convinced some time ago that quantitative methods were going to get more and more important in biology," Mr. Simons says of the inspiration for the Simons Center gift. "After the genome was sequenced and deep study of its structure got under way, it was evident that we were going to need more and better mathematical and statistical analysis." The Simonses had previously supported quantitative biology at the Institute for Advanced Study at Princeton. "Well, Marilyn [who is Vice Chairman of CSHL's Board] and I like Cold Spring Harbor, too, and so we thought some intensification of the quantitative effort could be made—that a real concentration of quantitative people would amplify efforts across the Lab." The final step in launching the Simons Center was finding a leader. "They only interviewed first-class people, and they were lucky to find Adam [Siepel]," Mr. Simons says. "He's first-class."

The iceman arrives



Meet Ötzi, the 5000-year-old mummified corpse of an iceman who lived in the Otzal Alps on the Italian-Austrian border during the Stone Age—around the time that the discovery of copper was transforming Europe. Now resident at the Lab's DNA Learning Center (DNALC), this true-to-life replica of Ötzi was made by world-renowned artist Gary Staub, using modern technologies like CAT scans and 3D printing. The Ötzi exhibit is part of the DNALC's innovative science education programming for children in grades 5–12. Yes, 12-year-olds are looking at Ötzi's DNA to determine his relationship and that of Neanderthals to modern humans. Only at CSHL!

Seed money for this project was provided by the Long Island Real Estate Group

LONG ISLAND LIREG REAL ESTATE GROUP

Eight new faculty

Camila dos Santos

Camila dos Santos

Assistant Professor | Ph.D., Universidad Estadual de Campinas, Brazil, 2006

Among the changes that occur during pregnancy, those affecting the breasts have been found to subsequently modify breast cancer risk. My laboratory investigates how the signals present during pregnancy permanently alter the way gene expression is controlled and how these changes affect normal vs. malignant mammary development.

Douglas Fearon

Douglas Fearon

Professor | M.D., Johns Hopkins University School of Medicine, 1968

I'm studying how to harness the power of the immune system to fight cancer. Our underlying premise is that the microenvironment within a tomb suppresses the immune system. We have found a way to eliminate this suppression in a mouse model of pancreatic cancer, which has led to development of a drug for human pancreatic cancer that entered phase 1 clinical trials in 2015.

Justin Kinney

Justin Kinney

Assistant Professor | Ph.D., Princeton University, 2008

From regulating gene expression to fighting off pathogens, biology uses DNA sequence information in many different ways. My research combines theory, computation, and experiment in an effort to better understand the quantitative relationships between DNA sequence and biological function. Much of my work is devoted to developing new methods in statistics and machine learning.

Je Lee

Je Lee

Assistant Professor | M.D., Ph.D., Tufts School of Medicine, 2002

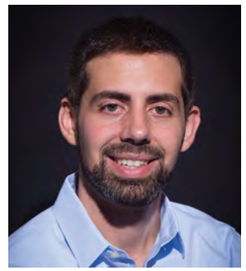
Cells are amazingly complex, with the ability to sense, and remember timing, location and history. I am exploring how cells store this information, and how their surroundings influence their communication with other cells. I am also developing various imaging and molecular sequencing methods for tracking genes, molecules, and cells to understand how cancer cells arise and evolve.

Dan Levy

Dan Levy

Assistant Professor | Ph.D., University of California, Berkeley, 2005

We have recently come to appreciate that many unrelated diseases, such as autism, congenital heart disease and cancer, are derived from rare and unique mutations, many of which are not inherited but instead occur spontaneously. I am generating algorithms to analyze massive datasets comprising thousands of affected families to identify disease-causing mutations.



Jason Sheltzer

Jason Sheltzer

CSHL Fellow | Ph.D., Massachusetts Institute of Technology, 2015

Nearly all tumors exhibit a condition known as aneuploidy—their cells contain the wrong number of chromosomes. We're working to understand how aneuploidy impacts cancer progression, in hopes of developing therapies that can specifically eliminate aneuploid cancers while leaving normal cells unharmed.

Adam Siepel

Adam Siepel

Professor | Ph.D., University of California, Santa Cruz, 2005

I am a computer scientist who is fascinated by the challenge of making sense of vast quantities of genetic data. My research group focuses in particular on questions involving human evolution and transcriptional regulation.

Jessica Tollkuhn

Jessica Tollkuhn

Assistant Professor | Ph.D., University of California, San Diego, 2006

I am interested in how transient events during early childhood development program neurons to take on a specific identity and function. More specifically, I am studying how estrogen and testosterone generate sex differences in the brain and behavior.

CSHL welcomes these seven professors and one CSHL Fellow to our multidisciplinary research community! The Laboratory has a legacy of investment in scientists poised to innovate and discover. Our faculty members are forging the future of biology and genetics. Find out more about them in the CSHL Faculty section at www.cshl.edu

Faculty & Friends

"We chose science!"

Watson School of Biological Studies Ph.D. students Anja Hohmann (right) and Maria Nattestad (left) rallied the crowd of 200 science philanthropists at the 14th annual Women's Partnership for Science luncheon in late September. "We Chose Science" was their cry, extolling the unique training opportunities that CSHL offers to aspiring biomedical researchers. The event, which since 2002 has raised $1.5 million for research and education at CSHL, honored Cathy Soref (center), visionary of the Double Helix Medals Dinner event and entrepreneur for all things DNA. Thanks to event co-chairs: Elizabeth Ainslie, Lori Bahnik, Kristina Perkin Davison, Irene Klein—the Claire Friedlander Family Foundation, Virginia Knott, Mickie Nagel, Jamie C. Nicholls, Louise Parent, Dr. Marilyn H. Simons, Cynthia Stebbins and Marjorie van de Stouwe, M.D.

CSHL alumna wins Lasker

Ninety-four-year-old Evelyn Witkin, Ph.D., was awarded one of science's top achievement prizes —the Lasker Award in Basic Science—for research that she pursued while at the Laboratory in the 1940s (pictured left with A.H. Sparrow at CSHL in 1953). Eighty-six Lasker laureates have received the Nobel Prize. Witkin identified the mechanisms of DNA repair and recombination through experiments on bacteria. "Along with her Cold Spring Harbor colleague at the time, Barbara McClintock, Evelyn was a pioneer in understanding fundamental aspects of genetics," says CSHL President Bruce Stillman. For more on Witkin and her accomplishments, please visit the CSHL Library & Archives pages at www.cshl.edu

Innovation breeds innovation

The Pershing Square Foundation (PSF) awarded Cold Spring Harbor Laboratory $10 million in support of exceptional leadership and innovative organizations that are catalyzing change in their respective industries. Uniquely structured, the fund's principal will be managed as an endowment by Pershing Square Capital Management. CSHL will receive an annual income of 5% of the principal to support its cutting-edge research and education. In 2040, the appreciated principal will be released to CSHL as an unrestricted endowment named the Pershing Square Innovation Fund to support research at CSHL in perpetuity.

"As one of the leading biomedical research centers in the world, Cold Spring Harbor Laboratory deeply understands the investments and calculated risks necessary for breakthrough discoveries in the life sciences," says Bill Ackman, co-founder with Karen Ackman of the Pershing Square Foundation and CEO of Pershing Square Capital Management, L.P. "With this long-term investment, CSHL will have the freedom and flexibility to pursue bold research that would not have been possible within a traditional funding structure."

New Helix Society member Lisa Manche congratulated by Assistant Professor Mickey Atwal

The Drive for 125

Celebrate Our Past, Preserve Our Future

In celebration of its 125th anniversary, Cold Spring Harbor Laboratory (CSHL) wants to grow the Helix Society to 125 members. Helix Society members have made planned gifts to CSHL. Join the Drive for 125 and be a part of the legacy!

Lisa Manche, a dedicated CSHL employee for over 30 years, recently made the Laboratory a beneficiary of her estate. Her gift provides financial resources for future scientists to pursue cutting-edge research in cancer and other genetic diseases.

To discuss making a gift to CSHL, contact Diane Fagiola at 516-367-8471 or email fagiola@cshl.edu

Cold Spring Harbor Laboratory
Cold Spring Harbor, NY 11724

Nicholls Biondi Hall

Every year, more than 12,000 scientists from all corners of the world are drawn to Cold Spring Harbor Laboratory's renowned scientific conferences and advanced technology courses. These gatherings offer intimate opportunities for scientific exchange on the latest research developments and are often the spark for new collaborations.

Opened in 2015, Nicholls Biondi Hall is a central venue for the Meetings & Courses Program on the CSHL Bungtown Road campus—a facility dedicated to enhanced communication among scientists who present their research findings in a visual format during what are called "poster sessions." Over the full 2-year meetings cycle, more than 5,000 posters are on display.

Thank you to CSHL Chairman Jamie C. Nicholls and O. Francis Biondi for the generous donation that made this possible.

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