

Charting a course for the future



President Stillman and COO Ayres with scientific staff at the 2014 In-House meeting.

With a strong 125-year tailwind, Cold Spring Harbor Laboratory looks to the future. What does that future look like? CSHL President & CEO Dr. Bruce Stillman and Chief Operating Officer W. Dillaway Ayres have a view of the Lab's research and education mission that is simple, consistent, and clear.

Basic research at the core

"One of the things I'm proudest about," says President Stillman, "is that over its 125-year history the Laboratory has been at the forefront of *basic science*." His view is echoed by all who are steeped in the Laboratory's history of achievement. The focal point of their pride, in Stillman's words, is that the "understanding of fundamental biology" produced by the Lab "has had a broad and highly beneficial impact." Excellence in basic research consistently has paid off, in marvelous and unpredictable ways. [See box, "Where our research is headed..."]

It is true, Stillman acknowledges, that "increasingly, public funding is being devoted to what is called translational, or applied, science." And, he is quick to add, "we are increasingly applying some of the basic discoveries we have made, for instance in cancer research, to the world of the clinic and the patient." This is also true in plant science, where CSHL discoveries in genetics are increasing the yield and range of vital food crops, while also pointing to novel means of generating future plant-based biofuels.

Basic research in neuroscience is just beginning to guide us to ideas for practical application. The Lab's deep investment in probing the neural basis of cognition will help explain the causes of devastating cognitive dysfunction in neurodevelopmental and neurodegenerative illnesses, from schizophrenia to autism to Alzheimer's. This new knowledge will inevitably bring to light novel targets for urgently needed new treatments.

That's the way basic science has worked from the Lab's earliest days. These are vital contributions, which Stillman wants to accentuate in the years ahead. Yet, even as greater attention is paid to clinical outreach and applications of basic research to medicines, agricultural products, and new forms of energy, the Laboratory's central mission is not translational and will not be in the future, Stillman stresses. "At the core, we must keep focusing on basic science, for that is where the big discoveries are going to come from." What Stillman, Ayres, and the CSHL Board of Trustees most highly value is "investigator-initiated science, where we give very capable scientists the resources to do what they want to do," Stillman says.

More aggressive public education

Since its founding, CSHL has been chartered as an educational institution. "We take our education mission very seriously," declares Stillman. CSHL's education programs span from middle and high school up to teaching the world's scientists the latest technologies. CSHL has a very innovative graduate program that is now a model for the world, and its scientific conference program is a magnet for biologists near and wide.

Expanding the Laboratory's global educational reach is a priority for Stillman. He explains that "we would like to propagate the Cold Spring Harbor Laboratory culture

and model of education throughout the world." This is happening through the DNA Learning Center. In partnerships with universities, high schools and governmental education agencies, we are teaching hands-on biology and genetics to children across the globe. Another example is the expansion of CSHL's scientific meetings program to Suzhou, China, where we are enabling a culture of young investigators to talk about their science in the way we have been doing it for so many years on our Cold Spring Harbor campus. By adapting continually to changes in communication and publishing technologies, meanwhile, the CSHL Press continues to enrich the global scientific community with books, lab manuals and highly rated journals that are the lifeblood of science education.

"As we translate our basic science into the clinic and into areas like food production, we're going to have to be much more aggressive about educating the general public so that they can make what I would call rational decisions about how to use the science," says Stillman. This is going to be especially important in topics such as the use of genetically modified plants for food production and to ensure that people understand the genetics of disease so that they can make informed decisions, with their doctors, about their own health. According to Stillman, "this requires sophisticated public education, and CSHL is at the forefront for the next century."

Operational strength from culture

The lab has more than doubled in size since COO Ayres came to CSHL 17 years ago, yet he has focused on making the Lab not just bigger but better. The future, for him, depends on preserving a laboratory culture that affords maximum latitude to principal investigators in pursuit of basic-research goals.

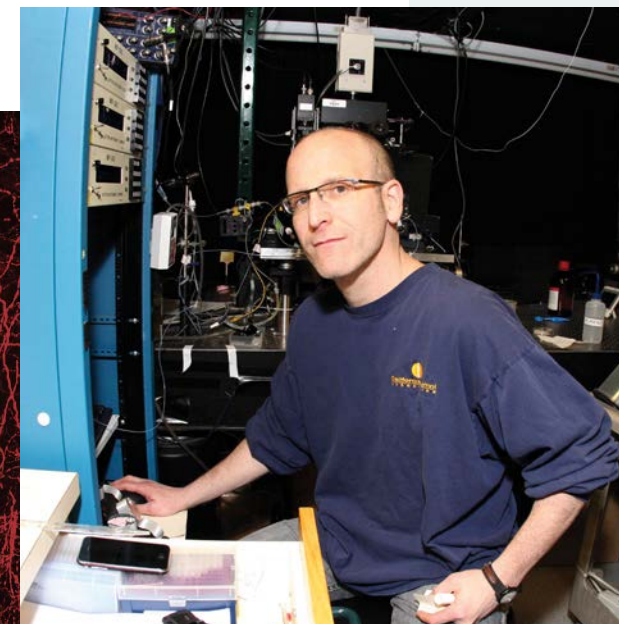
"I've always felt that our productivity is directly connected to our culture," he explains. "It's something that Jim Watson understood in 1968 when he left Harvard to lead the Lab. He deliberately established an environment conducive to doing great science." [See "A Lab like no other," p. 2]

"Where our research is headed..."

"I'm very excited about something we're doing that was inconceivable just a few years ago. My lab is developing new technologies to figure out the wiring diagram of an entire mouse brain, quickly and cheaply. We're converting the problem of neural connectivity into a problem of DNA sequencing. I'm optimistic this will provide a foundation for really understanding what is going on in the brain when an animal is thinking...."

Anthony Zador

See more from Zador and other CSHL faculty in our multimedia feature at www.cshl125/futurevision





Expanding the educational mission

“Hands-on science is the way to go,” says President Stillman. “I myself was not a great science student in high school, until I had the opportunity to do hands-on experiments. Then science became a natural thing for me. And I think we need to make that available to as many children and their parents as we can across the country. We will be doing that in New York City. We’ve had a great collaboration with the New York City Department of Education, which will be expanding. From a new DNALC facility in Manhattan, we will be teaching many more children in the City school system the DNALC way of doing science.”

The Lab is distinctive and attractive, in Ayres’ view, because of the value placed on intellectual rigor, collaboration and informality. He is therefore pleased that “the new, young class of investigators at CSHL are not only the best and brightest, but seem intuitively to ‘get’ the culture. They fit in, and this bodes well for our future.”

The chief challenge for Ayres, Stillman and the Board, in Ayres’ words, is how to sustain core values in a very difficult financial environment. “We are an independent research institute,” he observes. “Many of our peer institutions are struggling financially, looking at mergers with major universities or hospital systems. What is important to us is that CSHL maintain its independence, maintain its excellence, and continue to be able to do what it has done well.”

Looking to the future, Ayres dreams big. “When I go to bed at night I think about how I will sleep much better

when our endowment, which is now about \$430 million, reaches \$1 billion.” The Laboratory will have to depend increasingly on private funding. Not many years ago, over half the operating budget was funded by Federal grants. “The mix has shifted substantially. We are more and more dependent upon private philanthropy, and it is really what is going to make the difference. And not only at Cold Spring Harbor Laboratory. If America is going to continue to lead in the biological sciences and in basic research, it’s going to require increased private support. That’s inevitable.”

Stillman agrees. “Institutions like CSHL, to remain at the forefront, need the resources and the endowment to support a substantial part of our science. This is a goal for the future. I think it is the future of our success—and, indeed, our survival.”

Peter Tarr