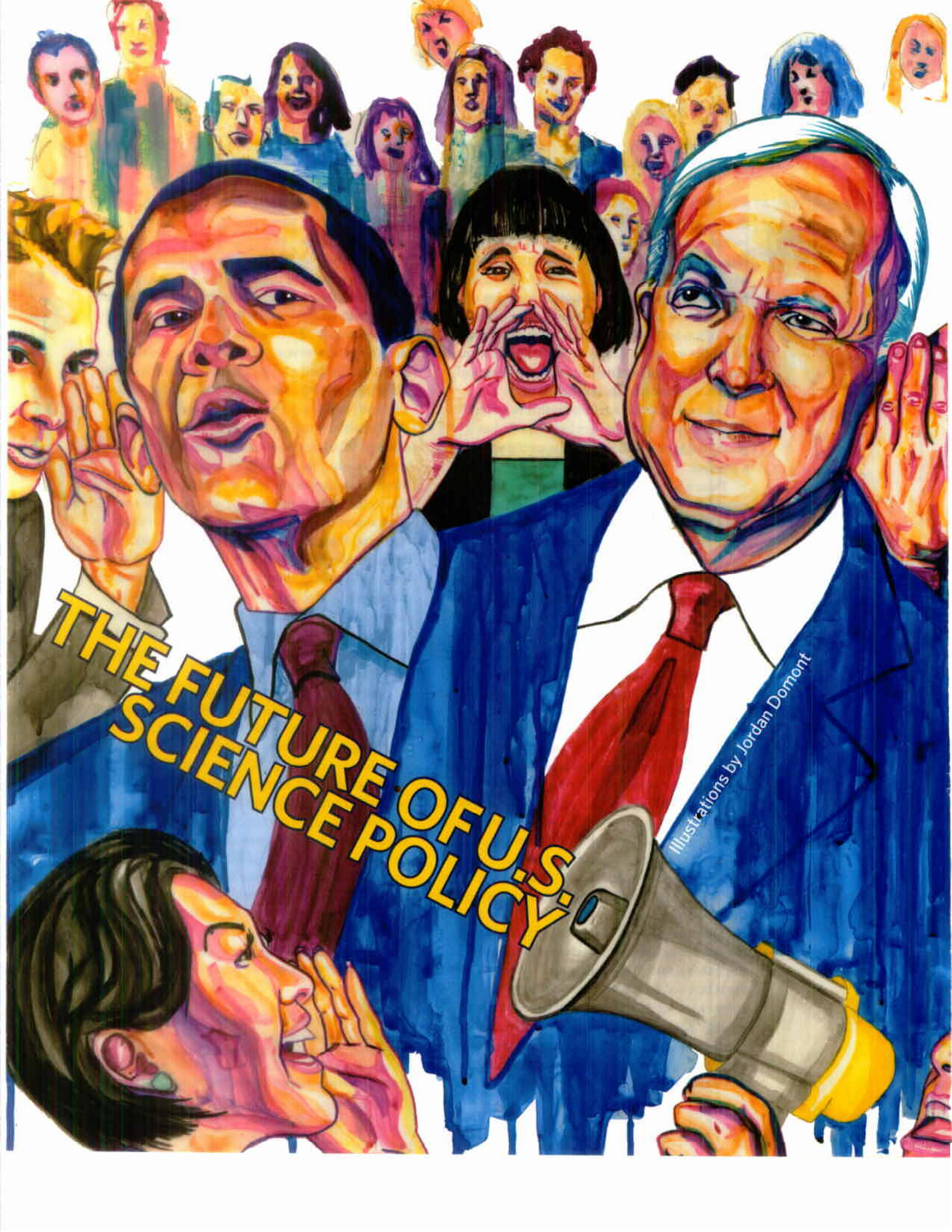
THE FUTURE OF U.S. SCIENCE POLICY
Illustrations by Jordan Domont

With an administration change at hand, research could come out of the shadows and into the political light.

In late 2001, the George W. Bush Administration stripped the Office of Science and Technology Policy director John Marburger of his official title – "assistant to the president" – and moved the office from its longtime home in the Old Executive Building in the White House complex to a site blocks removed from the Oval Office. It was a short distance, but symbolic, say critics of how the administration has handled science.

On top of frequent news articles quoting accusations of government meddling in science over the past few years, scientists have lamented the plateauing of the National Institutes of Health budget, and the woeful rate of acceptance for NIH grant applications (in 2005, only about 9% of R01 grants were successful).

"At a minimum, one could say that the last seven or eight years certainly have been a mixed bag for science," says Alan Leshner, CEO of the American Association for the Advancement of Science. "Is that reparable?" he asks. "Yes. Is it easily reparable? No."

If it is to be repaired, who might do it? Here, we profile four leaders who tend to stay out of the spotlight, but who have the potential to wield great influence over our country's stance on science, and the fate of US researchers.

Neither of the two presidential candidates – Democrat Barack Obama nor Republican John McCain – has expansively enunciated his vision for science policy, but the voting public has gotten glimpses of how the candidates might treat science as the next US President.

Answering a questionnaire issued by science advocacy group Research!America in October last year, Obama wrote that he supports increasing funding at the NIH, the Centers for Disease Control and Prevention (CDC), and "expanding and accelerating research using stem cells lines." In July, McCain also answered the questionnaire, writing that he supports funding the NIH and CDC (though not stating explicitly that he supports increasing funding of those agencies). Though McCain's answers were briefer than Obama's, he wrote that he also supports expanding stem cell research and has voted for some of ill-fated Congressional bills designed to overturn Bush's 2001 funding restrictions. McCain also wrote, however, that "clear lines should be drawn to reflect a refusal to sacrifice moral values and ethical principles for the sake of scientific progress," to underscore that "recent scientific breakthroughs raise the hope that one day this debate will be rendered academic."

The two candidates seem to have more closely aligned views on the importance of addressing climate change. Both have voiced a desire to expand the fight against global warming through developing alternative energies (though Obama speaks more about wind and solar, while McCain also trumpets cleaner coal and nuclear) and limiting carbon emissions.

Science policy experts agree that the next US President must first rhetorically mend the rift between research and politics in this country. According to Leshner, this healing starts with clear language about the importance of science and technology. "When leaders tout the place of science," says Leshner, "when they appreciate and recognize the contribution of science to modern life, it has a very big influence."

Equally important, says Research! America president Mary Woolley, is that the next US President restores the importance and prominence of his science adviser. "I think [the position] should be cabinet-rank," she says. Henry Kelly, president of the Federation of American Scientists (FAS) agrees. "The role of this person is more important than it has ever been."

Another part of restoring science's place at the political table, according to Woolley, is "recommitting to strong federal investments in the science-based agencies," such as the NIH, the National Science Foundation, and the CDC. "We need to put our money where our vision is."

Regardless of the November election's outcome, the scientific community seems to be looking forward to an improved relationship between science and politics. "I think we're all quietly hopeful that things will get better," says Leshner. Among other changes, making things better requires input from knowledgeable science policy advisors. Here are a few you may be hearing more from in the near future.

–BOB GRANT

KEN THORPE

An academic who swims in political waters

In 1967, when Ken Thorpe was 11 years old, his father took him to hear Martin Luther King, Jr. speak. They stood in an all-white Detroit suburb and watched King deliver an eloquent speech in a racially-charged environment. "It was remarkable in the sense that he put himself out there in a setting like that knowing that he likely was going to get heckled," Thorpe remembers.

More than 40 years later, Thorpe's colleagues say the Emory University health policy professor has put himself in hot seats of his own – national and state legislatures – to give his research a shot at changing health and science policy. As the cost of health care rises, and the prevalence of costly chronic conditions increases, those who have worked with Thorpe say his grounding in health care cost analysis will make him a key player in coming debates on health care reform and science funding.

"Given his reputation, intellect and network, he will be one of those leaders to whom all sides will turn [in the health reform debate]," writes former Senator Tom Daschle (D-SD) in an E-mail. Daschle worked closely with Thorpe to pass health care reform in the mid 1990s.

EGILS MILBERGS

Shaping federal science and technology policy from three time zones away

Though economist Egils Milbergs began his career inside the Beltway, he has worked on issues from the national to the local level, and now finds himself about as far away from Washington, DC, as a person passionate about national policy can get – in a place he calls "the other Washington."

Chris Gregoire, the Governor of Washington, appointed Milbergs to direct the state's newly formed Economic Development Commission back in January, and the economist is using all the knowledge he gained working on science policy at DC-area think tanks, lobby groups, and in federal agencies to craft an ambitious plan. "I'm taking a deep dive into one state," says Milbergs.

His plan is to craft an economic development plan for Washington State that incorporates all sectors, not just science, from high technology to traditional agriculture. Milbergs says that the commission is conducting a "regional experiment": Foster an understanding and appreciation for science and innovation in Washington State, and use the state as a model for federal policy makers. "I'm convinced that whatever comes out will be applicable on a federal level," he says. The commission is currently in its "organizational phase," Milbergs says, taking stock of Washington's innovation, talent, and infrastructure resources and identifying areas where development is needed, and it hopes to publish its first report in early 2009.

"We're all curious to see what he'll be able to do [in Washington state]," says Kent Hughes, director of the globalization and innovation program at the Woodrow Wilson International Center for Scholars, and a Reagan-era colleague of Milbergs'. "He's going to be someone who's consulted in the future."

After attending Harvard College, where he focused on public policy and economics, Milbergs worked at the federal Bureau of Budget, now called the Office of Management and Budget. There, Milbergs got his introduction to parsing out the intricacies of a national budget that funded dozens of federal R&D agencies, including the National Institutes of Health and the National Science Foundation. "My interest in this stuff started here," Milbergs says. "I learned the numbers."

Then he moved into the nonprofit sector, taking a position the Stanford Research Institute International, a think tank where he continued to focus on federal R&D policy. In 1980, Milbergs returned to government, becoming Malcolm Baldridge's Deputy Assistant Secretary for Productivity, Technology and Innovation at the Commerce Department, where he worked on increasing

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"Given his reputation, intellect and network, he will be one of those leaders to whom all sides will turn [in the health reform debate]." Tom Daschle

"It's good that [Thorpe] can continue to work in a university setting and make the connection to Washington," says longtime colleague Tom Ricketts, professor of health policy and administration from the University of North Carolina at Chapel Hill. "He sets the model for engaged scholarship. He's somebody that you'd like to be like."

Thorpe has analyzed the effect of health insurance taxes and studied the economic impact of chronic health conditions such as diabetes and obesity. Trying to advocate for policy changes, Thorpe says, feels like a natural extension of his research, albeit logistically difficult because he splits his time between a home in Atlanta and another in Washington, DC.

Thorpe says that making the right investments in biomedical research at the NIH is key to fighting chronic conditions such as Alzheimer's disease. "We have to find cures to either prevent Alzheimer's or intervene earlier," he says. "Chronic conditions are incredibly costly to treat."

After conducting analyses of President Bill Clinton's proposed health care reforms in the mid-1990s, Thorpe, who also heads the lobbying coalition Partnership to Fight Chronic Disease, researched why the cost of health care has risen so fast. Looking at trends for the 25 most expensive health care conditions, he teased apart the costs due to rising prevalence and those due to increased spending per patient. He found that 20-30% of the spending increase was due to obesity's rise since 1985. About 75% of health care spending was associated with patients who had one or more chronic conditions. Jim Tallon, president of the United Hospital Fund who has worked with Thorpe in both academic and political settings, says Thorpe has been successful in translating "the science of his analysis to political understanding." In the 2000 and 2004 Presidential elections, "he was really the scorekeeper for all of the Democrats' [health care] proposals."

A few years ago, he worked with Vermont lawmakers, providing technical advice for health reforms. Once Thorpe signed on, remembers former Vermont Senator James Leddy, he lowered the temperature of a heated debate between the state's Republican governor and the Democratic legislature by reframing the discussion around health care cost rather than expanding coverage. In 2006, lawmakers passed two bills, aimed at improving care for people with chronic conditions and helping the uninsured get coverage.

In the last few months Thorpe began working with West Virginia's legislature to help the governor and interest groups agree on a comprehensive health care reform plan. "He can handle the hot seat as well as anyone I've worked with," Leddy says.

–KELLY RAE CHI

the intellectual property rights of federal research and development laboratories, among other issues. While at Commerce, Milbergs headed Ronald Reagan's President's Commission on Industrial Competitiveness, which produced a seminal report entitled "Global Competition: The New Reality," that laid out a plan to keep the country at the forefront of technology at a time when globalization was in its infancy. He also helped developed guidelines and procedures necessary to implement the newly-passed Bayh-Dole Act, landmark legislation that established a framework for technology transfer between academia and industry. "I felt, at that point, I had made my contribution to public policy," Milbergs remembers.

Gregory Tassey, senior economist at the National Institute of Standards and Technology, says Milbergs envisions a research and technology-based economy functioning like an ecosystem, with multiple parts and players, such as basic research at universities, translational research in the private sector, and commercialization, all interacting to impact economic development. Tassey says that Milbergs' way of thinking is pushing a "new paradigm" that sees scientific research as a cornerstone of progress.

Bob Boege, executive director of the Alliance for Science and Technology Research in America and Milbergs' former collaborator, says that Milbergs' focus on innovation as a key economic driver is sorely needed. "We do not have a national innovation policy," Boege says. "It's insane. Egils is an individual who has created a taxonomy and a working nomenclature for innovation."

—BOB GRANT

JOHN PORTER

Advocating science from inside the House

In 1995 when the Republicans took over the US House of Representatives, times were tight for the Appropriations Subcommittee for Labor, Health and Human Services, and Education, which allocates funds to the National Institutes of Health. Under a new budget resolution, the House budget committee told John Porter, then subcommittee chair, he needed to shave 5% from the National Institutes of Health budget each year for the next five years. "I thought it was insane," Porter recalls one June afternoon from behind his imposing mahogany desk at Hogan and Hartson, a law firm in Washington, DC.

He quickly gathered a group of 10 Nobel laureates, CEOs of pharmaceutical companies, and members of the Federation of American Scientists for Biomedical Research to convince Newt Gingrich, Speaker of the House, to stop cutting the NIH budget and instead to give the agency a boost. "Newt gave us one hour, we all talked about why such cuts were so detrimental," Porter recalls, "and then Newt said, 'I think we've made a mistake.'"

Since the budget committee's guidelines are non-binding, Gingrich gave Porter approval to write a separate small bill boosting NIH funding by 5.7%. The bill was passed with little debate and was on the President's desk and signed even before the larger appropriations bill hit the floor. Porter wouldn't stop there. The following year his committee increased the NIH's funding by 6.9%, and by 7.1% the following year. By 1998, Porter rallied his counterparts in the Senate to double the NIH budget in increments of 15% a year for five years straight.

There was a lot of work involved in doubling the agency's budget, but "he was up to the task," says Mary Woolley, president of Research!America, where Porter is chair of the board of directors. "He never sought out any spotlight or attention for the role he played, and there's absolutely no doubt he's the person who made it happen."

As a partner at Hogan & Hartson, Porter, 73, now spends nearly all his time extolling the benefits of biomedical research and lobbying Congress on behalf of more than 15 universities, research institutions, hospitals, and other nonprofits. He encourages scientists to take an active role in electing Congressional leaders who support funding research, or to get involved in politics themselves. In 2005, when the Bush Administration stripped

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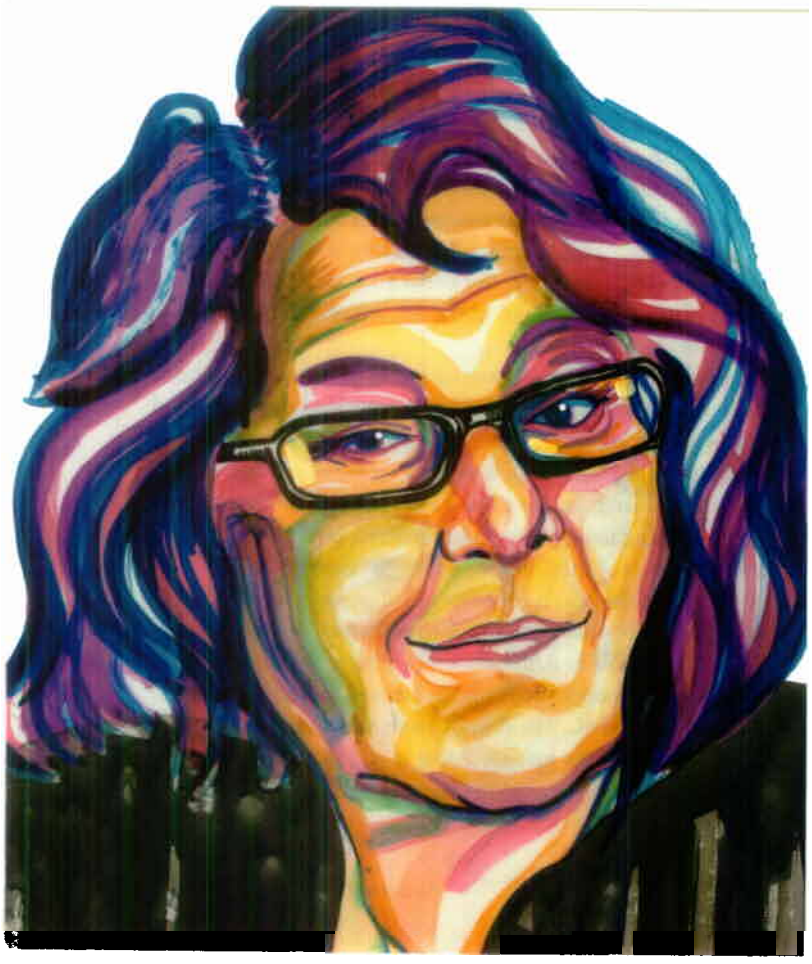
> —Harold Varmus



LANA SKIRBOLL

[illegible] the NIH

The Office of Science Policy at the National Institutes of Health, directed for the last 15 years by former neuroscientist Lana Skirboll, is sometimes jokingly referred to as the OKS – the Office of the Kitchen Sink: What comes over the transom is often half-baked, requiring some quick thinking and foundation-laying to shape useful policy.

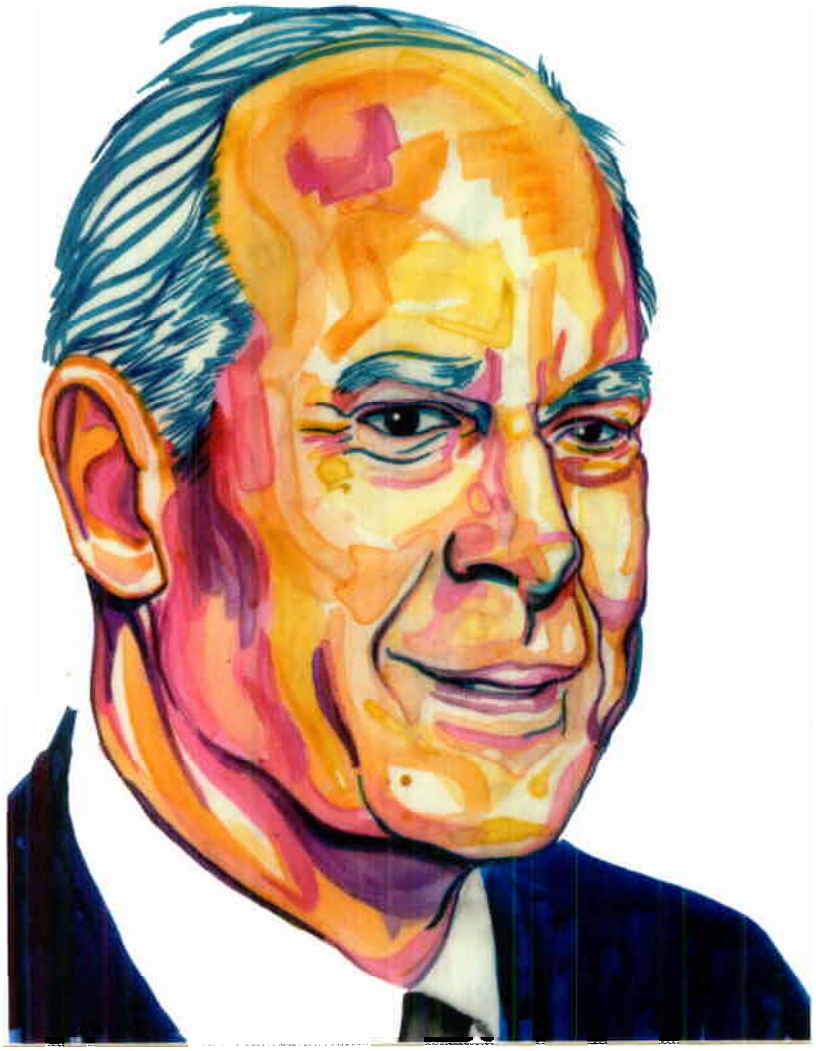
Skirboll displayed her knack for quick thinking in early 2001, when incoming President George W. Bush announced plans to develop a federal policy for embryonic stem cell research. As head of the OSP, Skirboll's first job, says NIH's Acting Director at the time, Ruth Kirschstein, "was to get the science in perfect order and make it understood" by White House staffers, lawmakers and the public. In the next four months, Skirboll held countless educational focus groups and compiled an illustrated 222-page book on stem cell science. Then, Tommy Thompson, Secretary of Health and Human Services during President Bush's first term, requested a tally of all available stem cell lines; a few weeks of informal calls to researchers worldwide uncovered just over sixty, many either not research-ready or privately owned. Skirboll's research was the foundation on which President Bush based his

funding from the National Children's Study – a project intended to track the healthcare data of 100,000 children from conception to adulthood – Porter lobbied to get funding restored to the project and successfully secured $59 million for the program in 2007, $111 million for 2008, and $192 million for 2009.

In 2003, he lobbied for continued funding of a campaign run by the Centers for Disease Control and Prevention to encourage children to exercise, support for which had been cut from the federal budget. In two years, he secured more than $130 million for the program.

In 2006, Porter represented a coalition of professional societies representing 28,000 physical and biomedical scientists who felt that funding for technologies used in biomedical research (like radiology machines and lab equipment) was insufficient. Porter met with the leaders of the National Science Foundation, the Department of Energy's science department, and NIH, and crafted a proposal called "Bridging the Sciences" which authorized NIH to fund science technology proposals that would be reviewed by panels of physical scientists, rather than biologists alone.

The secret to Porter's success, says Harold Varmus, Nobel Prize winner and former NIH director, is that he knows how Washington, DC, politics work and yet is a "reasonable, bipartisan creature." His views of science are well balanced, Varmus adds, and Porter continues to be influential in persuading people that "the health of the economy can be translated from funding medical research." —ANDREA GAWRYLEWSKI



policy, which restricted federally funded research to lines derived before his August 9th announcement. But the policy itself was as much news to NIH staffers as to the public, Kirschstein says.

Skirboll has worked on most major issues affecting life science researchers over the past two decades. Her job is not to advance

"She's so darn good."
– Tommy Thompson

specific agendas, but to serve as an intermediary force connecting scientists, lawmakers, and public advocates; bringing the right people together so they can reach a consensus. As such, she seeks to remain invisible; she declined to be quoted for this piece, except to say that, "I like the focus to be on the science and the policy, not on me."

After completing two postdocs, at Yale University and the Karolinska Institute, Skirboll came to the intramural research program at the National Institute of Mental Health (NIMH) to head the electrophysiology unit. The program's director, Frederick Goodwin, quickly noted that she was a "good scientific citizen," he says. As a result, he brought her along as his assistant as he advanced. When Harold Varmus took over as NIH director in 1993, Skirboll applied for the job of Associate Director for Science Policy. Goodwin recalls her relating that in her interview, she voiced support for some criticisms of Varmus, adding that Skirboll's candor likely helped win her the post. In top positions such as NIH Director, "you get sandwiched by yes-people," says Goodwin, "and that's very dangerous."

Science policy "really came of age" during the first half of Skirboll's tenure, says Kirschstein, who served as Varmus' Deputy Director; the doubling of the NIH budget between 1998 and 2003 made life sciences all the more visible. Under Skirboll's leadership, the OSP refocused the role of the long-standing Recombinant Advisory Committee to clinical trial oversight after the death of patient Jesse Gelsinger shook the research community. Skirboll also played a major role in advancing Elias Zerhouni's Roadmap Initiative by finding common ground between the NIH, the FDA and the pharma and biotech industries, and developed a clinical research analysis program that has put the focus on privacy concerns in genome-wide association studies. "Lana has an uncanny ability to see an issue from 360 degrees," says Amy Patterson, who directs two offices within the OSP and has worked for Skirboll for more than 10 years.

A new NIH director – expected to be appointed after the November Presidential elections – could decide to replace Skirboll. However, she's already weathered 15 years and two administrations, suggesting her time may be far from up. She's lasted this long, says Thompson, "just because she's so darn good."
— ALLA KATSNELSON