

Gut Instinct

When Larry Smarr pulls out a plastic model of his colon that he made with a 3D printer and simultaneously projects on a screen behind him a magnetic resonance image of his guts, it becomes abundantly clear that he believes a presentation benefits from a most personal touch.

Smarr started out as an astrophysicist and has followed an intriguing career arc from probing black holes to his own bowels. Three decades ago, he helped establish a network of supercomputer centers in the United States and was a cyber pioneer. (His grad student made the first Internet browser.) Today, the University of California, San Diego, professor runs the California Institute for Telecommunications and Information Technology (Calit2), a multidisciplinary center meshing nanotechnology with wireless communications, genomics, and computer science. Calit2, Smarr hopes, will become a force in personalized medicine—and his colon has become the centerpiece of a campaign to show the world how patients can take a more active role in their own health care by exploiting technological advances to collect genomic, biochemical, and physical data.

For several years, Smarr has intensely monitored his health, a preoccupation that in 2010 helped him diagnose, ahead of his doctors, inflammatory bowel disease. In a talk he has given everywhere from Harvard Medical School to the U.S. National Institutes of Health, Smarr shows startling graphics that chart myriad biochemical and physical perturbations in his body linked to what he believes is a condi-

tion with features resembling Crohn's disease and ulcerative colitis. He paid a company to measure blood markers that standard tests ignore, and, with the help of the J. Craig Venter Institute's genomic analysis of his fecal samples, he has documented how his body has killed off many beneficial bacterial species in his gut while allowing harmful ones to thrive. His plastic colon and the MRI scans fill out the sad picture of a gut gone haywire.

By blending systems biology and personal drama, Smarr's talks bowl audiences over. He speaks plainly; is passionate about his data (without bathing in self-pity about his disease); and makes the abstract concrete with his plastic colon, a prop that he passes around the audience. "I've given hundreds if not thousands of talks on so many different topics, and I've never had the kind of reaction I've had in the last few years," Smarr says. "When you talk about what's going on inside the human body, everyone relates."

A critical moment in his talk comes when he emphasizes that 90% of the DNA in our bodies is bacterial, and we can now sequence that foreign material to understand our health. "A lot of the reaction is, 'How did I miss the memo that 90% of



the cells in my body aren't human?' " Smarr says. "It's a moment of massive discovery essential to every single human on Earth. These moments don't come along more than a couple times in a century."

Few scientists have the luxury of drawing on data from their own bodies to captivate an audience, but one technique of Smarr's is widely applicable: Don't miss the forest for the trees. He suggests scientists imagine themselves as a baker—not a flour specialist—explaining how to make a fancy cake. "It's the integration of several ingredients over time," he says. "We aren't trained to think that way. We're trained just the opposite."

—J. C.

and those who agree to register. That platform gives the society more control over content before it is posted. "We'll probably live stream at least one event this fall," he says, while some two dozen symposia will be captured and put into the archives.

Likewise, the American Society for Microbiology drastically curtailed live streaming of last month's annual Interscience Conference on Antimicrobial Agents and Chemotherapy. The decision was based on a membership poll showing that 90% of the people who wanted online access to information from a meeting they could not attend chose the "archived with no live" option. "Live streaming is also the most costly option," says Connie Herndon, the society's director of meetings, speaking before the meeting, "so if our attendees don't really want it, then we'll probably reduce it to a minimal amount."

Logistics are another reason the venerable annual meeting is likely to persist. Organizers book meeting venues up to a decade

in advance, so any changes would necessarily take a long time to show up. "We're so big that we only fit into a few cities," says Nancy Todd, conference manager for the American Chemical Society (ACS), which holds large meetings in both the spring and the fall. Combining the two meetings, she says, would only worsen the space crunch.

But perhaps the biggest deterrent to change is the inherent conservatism of the community. "We've had two meetings [a year] since the beginning of time," Todd says. "It's what our members want." Neither federal cuts nor the Internet seem likely to change that winning formula for ACS and its sister organizations anytime soon.

—JEFFREY MERVIS

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