Judging merit

Study sections' marching orders have changed, too. In 1997, Varmus ordered peer reviewers to consider "innovation" as one of their explicit criteria in weighing grant applications. He was trying to break study sections' habit of favoring "safe science"—incremental projects using tried-and-true methodology—over more imaginative but riskier proposals that might pay bigger dividends.

CSR director Ellie Ehrenfield and CSR Advisory Committee chair Keith Yamamoto, of the University of California, San Francisco, say that progress has been made but the job isn't quite done yet. "We're trying to make a shift in reviewers' mind-sets," Ehrenfeld says. "We're trying to change people's behavior. None of these things will be solved by a single magic bullet." The problem is an old one. Newly named Nobel Prize–winner Günter Blobel of The Rockefeller University in New York City recalls (with a laugh) that in 1986, an NIH study section trashed a proposal of his as impractical, "and I found the critiques not constructive but offensive." But Blobel emphasizes that the NIH peer-review system "is a very good one," and he says most of its decisions are right.

NIH also has simplified grant applications—and reduced opportunities for reviewers' second-guessing—by ending the requirement for detailed budget plans in most "investigator-initiated" grant applications. Under the "modular grant" and "just-in-time" approaches, researchers in most cases simply ask for funding in increments of $25,000; detailed budget justifications and many other paperwork requirements don't come until after a grant is approved. Additional changes are in the works—although some have been a long time coming.

"No matter how we organize study sections, what really matters is the people sitting around the table," says Ehrenfeld. Thus CSR is trying to broaden study-section recruiting and has experimented in an informal way with several devices to make peer-review service less onerous. These include tours of duty that involve less than the conventional three meetings a year for 4 years and shared assignments that allow scientists to substitute for one another at some meetings. But none of these changes has been implemented in a systematic way.

CSR officials, and Varmus, also are still puzzling over how to lure more senior scientists back onto study sections. This could bring more consistency and credibility to the process, they say, but senior scientists are generally unenthusiastic about the idea. "They've done it before," says Varmus, "and they're on to other kinds of advisory activities, some of which are probably more fun and less work."

Varmus himself, of course, will be eligible for study section service next year, after he leaves NIH to become president of the Memorial Sloan-Kettering Cancer Center in New York City. Will he volunteer?

"Volunteer?" he replies. "No. But if they call me, I'll think it over."

Since 1996, Yamamoto and others have been pushing another idea that is just now taking effect: oversight by "IRG Working Groups." These will be teams of eight to 10 extramural researchers who will attend at least one round of peer-review meetings, monitor the activities of their IRG and its component study sections, and offer advice on whether the scientific boundaries between study sections are still appropriate—as well, no doubt, as on the conduct of reviews. In effect, they will peer review the peer reviewers. If they can exercise enough diplomatic skill to avoid friction with study section members and chairs, they may provide a mechanism for adapting the peer-review system as science evolves. Alberts is counting on the IRG Working Groups to keep the system up to date. He sees this as a "great once-in-a-lifetime opportunity to create a system that won't be just locked in place, but can continually be evaluated by outside experts—and in which modern science, which is changing so rapidly, can really be adequately be supported and tracked." The first three IRG Working Groups are already on the job. Five more are in the planning stage.

For individual researchers, however, the biggest boon may come from more efficient communication through the Internet. NIH officials say they are only a year or two away from establishing a long-sought system of electronic submission and review of grant applications that could slash by nearly one-half the 10-month lag from submission to award. Doing away with time lost to printing, collating, distributing, and mailing grant applications also might enable researchers to submit revised proposals without missing a grant-award cycle.

Whatever the outcome of the Alberts panel recommendations, peer review is changing. And perhaps it should be no surprise that the process is taking longer than anyone would like. "This really is like turning a big ship," Yamamoto says. "Ellie is trying to do a lot of things at the same time, with a staff that's already overburdened."

Will Varmus's departure in January slow the momentum? Yamamoto hopes the loss will be limited. "He's put the ship in the right direction," Yamamoto says. "Inertia can be a friend here." **–BRUCE AGNEW**

Bruce Agnew is a writer in Bethesda, Maryland.

SCIENTIFIC MISCONDUCT

The Misconduct Case That Won't Go Away

The University of Arizona fired Marguerite Kay last year, but supporters nationwide are rallying to her cause and a legal decision is pending

A contentious scientific misconduct case that has divided faculty at the University of Arizona may be heading toward a new climax. This month, an Arizona state court is considering a request by the accused—a prominent researcher on aging, Marguerite Kay—to be reinstated as Regents Professor at the University of Arizona (UA), Tucson. University president Peter Likins dismissed Kay abruptly on 15 July 1998 after a series of faculty-led investigations concluded that Kay had manipulated data and seriously mismanaged her lab. Kay has appealed the dismissal to the state court, which issued a decision partly in her favor on a different legal basis in April. The current appeal could be decided in a few weeks.

Kay, cited for her research on the aging of blood cells and the role of the immune system in Alzheimer's disease, has enjoyed the continuous support of a vocal contingent of the faculty. Her foremost advocate is her former department chair, John Marchiolonis, head of microbiology and immunology. He insists that the scientific misconduct charges against Kay were played up by administrators who resented Kay's challenges to their decisions on lab resources and service fees.

Former UA vice president for research Michael Cusanovich, who coordinated the initial Kay investigation, says these allegations are unfounded. The inquiry, he says, began when one of Kay's former technicians filed a written complaint with the university, and the investigation was conducted by independent panels selected by the faculty, in accordance with UA rules. Marchiolonis and Carol Bernstein—a

member of the same department and local president of the American Association of University Professors—have circulated many letters supporting Kay from outside the university, including from the national AAUP and well-known researchers. Among those who have questioned the UA proceedings are former National Institute of Mental Health director Frederick Goodwin, now a researcher at George Washington University in Washington, D.C.; former National Institute on Aging official Zaven Khachaturian, now director of the Ronald and Nancy Reagan Research Institute of the Alzheimer's Association; molecular biologist David Soll of the University of Iowa, Iowa City; Stanley Azen of the Doheny Eye Institute at the University of Southern California, Los Angeles; and neurology researcher Paul Coleman of the University of Rochester in Rochester, New York.

Likins isn't commenting on the case because, an assistant says, "it would be inappropriate" to do so while it's in litigation. But he did make a dramatic and detailed presentation of his reasons for firing Kay at a faculty senate meeting last December. According to a videotape of that meeting, made available to *Science* by Bernstein, he told the faculty he had made this "agonized" decision after a careful review of the evidence collected by an investigative panel, which found Kay guilty of four counts of misconduct. The university began looking into the case in 1997 after one of Kay's technicians filed written allegations of misconduct, claiming that Kay had manipulated experimental results. An ethics panel then found cause for investigation; an investigatory panel collected evidence and brought an indictment; and a third panel reviewed the work of the earlier panels and held a public hearing at which Kay testified. It concluded that Kay had "falsified, manipulated, and otherwise misrepresented data and findings in publications," and that she had egregiously "mismanaged her UA laboratory and employees." It recommended that her employment be "terminated."

Likins told the senate meeting that he found some of the evidence equivocal, but was particularly swayed by one set of data from a table that Kay included in a review article published in the journal *Gerontology* in 1997. Likins presented a detailed analysis showing beyond a doubt, he said, that the author had selected raw data to make results appear significant when they were not. This misconduct gave credence, he argued, to other charges of data manipulation brought against Kay by lab technicians. Likins also revealed that, out of "compassion," he had offered to retain Kay on the faculty if she would acknowledge her misconduct. But she refused, and he fired her immediately.

Kay says that as soon as she learned from her staff that data in the *Gerontology* paper were erroneous, she wrote to the journal to have the table withdrawn. Her correction letter, published in *Gerontology* in June 1998, blames a technician for the mistakes. Today she says that she doesn't know how the errors crept in. She insists that she relied entirely on her staff for statistical computations. In any case, she says, the table was "irrelevant" to the points she made in the text of the review. Finally, Kay says that the collection of damning data presented to the faculty by Likins was a "cut and paste" assemblage—not raw data—which she had never seen in the form Likins produced. She believes that her integrity was challenged by disgruntled staff members and that a hostile administration used the criticism to dismiss her.

CREDIT: C. RICHARDS

Awaiting court ruling. University of Arizona Alzheimer's researcher Marguerite Kay.

On 15 August 1998, Kay filed suit against UA and its officials in state superior court for Pima County, arguing that the university had violated her due process rights by dismissing her without adequate notice or opportunity for review. Kay was shut out of her research lab before the public hearing that found her guilty of misconduct, for example. And she claims she was fired without severance pay or a chance for an appeal.

Judge Stephen Villarreal's finding in April 1999 said that the university had acted in an "arbitrary and capricious" manner in firing Kay without a regular personnel hearing. The judge did not review the misconduct allegations but found that the 5 days of public hearings on these charges from 30 March to 4 April 1998 were not equivalent to a hearing on dismissal, which university rules require. Villarreal found that UA should give Kay such a hearing, but Kay and the university still have not aggreed on how to proceed.

Kay has asked Villarreal to review her case again, for another reason. She has claimed "whistleblower" status under state law because she had complained in the past about administrative actions taken by Cusanovich. In an independent case, the Arizona Supreme Court found on 4 October that a whistleblower employed by the state may be represented by an attorney during a dismissal proceeding. But UA did not allow Kay to be represented by an attorney during her misconduct trial. (Her attorney was at her side, however.) On 5 October, Kay filed a motion asking Villarreal to nullify her dismissal because due process was violated. The judge's decision is expected soon.

Kay's supporters at the university have become more vocal this fall, protesting her firing as a violation of academic rights and a threat to tenure. A faculty leadership group known as the Committee of Eleven voted unanimously in August to ask Likins to reinstate Kay to her job. This panel includes Marchiolonis and the chair of the faculty senate, English professor Jerrold Hogle, who previously supported Likins's decision. Hogle could not be reached for comment.

In addition, a constitutional law specialist on the legal faculty, Roy Spece Jr., conducted an investigation on his own initiative and concluded, as he told the faculty senate in September, that the process was heavily biased against Kay from the outset because the UA general counsel privately interviewed a technician in Kay's lab, a key witness against her. Spece told the senate the proceedings were deeply flawed on legal grounds and at odds with UA rules, which require that faculty members be given full notice before being dismissed.

It's unclear whether any of these protests—or the state court's decisions—will cause the university to ease its punishment of one of its most distinguished biomedical researchers. But one thing is certain: Likins is discovering—as others have before—that disputes over scientific conduct rarely die. They just get more expensive.

—ELIOT MARSHALL