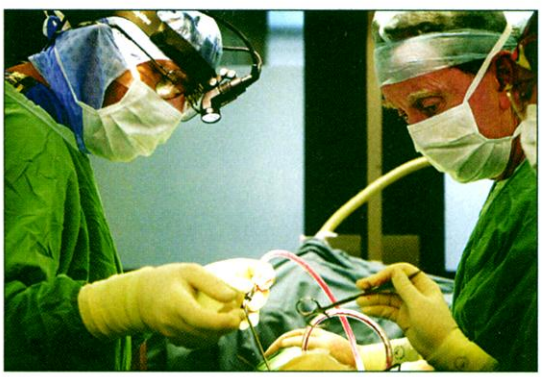
large group of faculty members are from other universities both at home and abroad. So we need a written document to guide and instruct our teachers and to prevent them from misconduct." **–DING YIMIN**

Ding Yimin writes for *China Features* in Beijing.

SCIENTIFIC MISCONDUCT

Australia Probes Kidney Researcher

SYDNEY—The Australian government has frozen funding to a prominent medical researcher and clinician pending the outcome of an investigation into allegations that he committed scientific misconduct. The case has raised questions about the adequacy of the country's present system of investigating misconduct.



Open inquiry. Bruce Hall (left) is under investigation by the University of New South Wales.

The allegations against Bruce Hall, a renal transplant physician and professor of medicine at the University of New South Wales (UNSW), have been made by three members of Hall's laboratory. In a series of submissions to university officials beginning last fall, they alleged that Hall misrepresented and fabricated experimental results, manipulated authorship credit in presentations and papers, and provided false data on a federal grant application. The work in question involves the role of CD4+ and CD25+ cells in organ acceptance and rejection as well as experiments involving monoclonal antibodies. Hall has declined to comment on any aspect of the case.

This month, in an attempt to put pressure on the university, the researchers—Clara He, Juchuan Chen, and Hong Ha—took their charges to ABC radio, which aired them last weekend. Two days after the ABC story ran, the UNSW Council, the institution's governing body, ordered an outside inquiry into the matter as well as an internal review of the university's procedures relating to possible misconduct. "The allegations are enormously disturbing," says council member Jeremy Davis, a former dean of the university's management school and past president of the academic board. "If the allegations are true, all our deep processes have failed."

Immediately after the show aired, John Ingleson, the university's deputy vice chancellor, issued a statement saying that the radio program "contained a number of serious inaccuracies." The statement also asserted that "the university has taken all appropriate steps to investigate the complaints referred to in the program." Ingleson said that its findings would be made public but did not give a timetable.

In a 16 January letter to UNSW officials, the National Health and Medical Research Council (NHMRC), the country's leading biomedical research funding agency, said that it was suspending a recently awarded grant to Hall—one of several he holds from the council—because of questions He had raised about the accuracy of the data upon which the application was based. "We don't have a view [on the truthfulness of the allegations]," says a council spokesperson. "But we take the matter very seriously, and we've asked that [the investigation] be done quickly."

Australia has no national body to monitor, investigate, and prosecute allegations of misconduct. Instead, each institution sets its own procedures, which must follow relevant state employment or anticorruption laws. To receive federal funding, institutions must agree to a code of conduct written by NHMRC and a nationwide body of university vice chancellors.

But that system may be inadequate for the task, says Merrilyn Walton, an ethics scholar at the University of Sydney and a former state commissioner for health care complaints. While making no judgment on the allegations against Hall, Walton says it's unrealistic to require institutions to root out serious scientific misconduct that could damage their reputations and their bottom lines. "It's like asking police to investigate police," she says.

–LEIGH DAYTON

Leigh Dayton writes from Sydney.

CHEMISTRY

To Net Big Molecules, Widen the Mesh

Some tradeoffs seem unavoidable. Industrial efforts to purify water or natural gas, for example, separate desired compounds from mixtures by passing them through membranes pocked with tiny holes. The smaller the holes, the more selectively the membrane lets molecules pass. But the tighter passage also slows the overall flow, requiring the use of higher pressures to push compounds

ScienceScope

Touching a Nerve Do investigators believe that grant size and duration have a big impact on their research? The National Science Foundation (NSF) is still tallying the answers to that and other questions put to some 6000 grantees as part of a study ordered by the White House budget office. But the 92% response rate to its Web-based questionnaire indicates how strongly researchers feel about the subject, officials say.

"I've never seen such a high response. It's amazing," says Norman Bradburn, a survey veteran who heads NSF's social and behavioral sciences directorate. NSF director Rita Colwell expects that the survey results, due out next month, will help her persuade Congress and the White House that larger, longer awards would make researchers more productive. "We hope it will reveal what more they could do with the right size and length of grants," Colwell told the National Science Board at its March meeting. The average NSF grant is now $113,000 and runs for 2.9 years.

One Beluga, Two Beluga Responding to critics, an international body has disclosed the data it relied on in allowing Caspian nations to resume fishing beluga. Pressure groups have argued that stocks of this sturgeon species, prized for its caviar, cannot sustain commercial harvest (*Science*, 22 March, p. 2191). But the secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) deems the beluga's status "far from precarious," claiming that there are an estimated 9 million individuals in the North Caspian alone (www.cites.org/eng/programme/Sturgeon/catch.pdf).

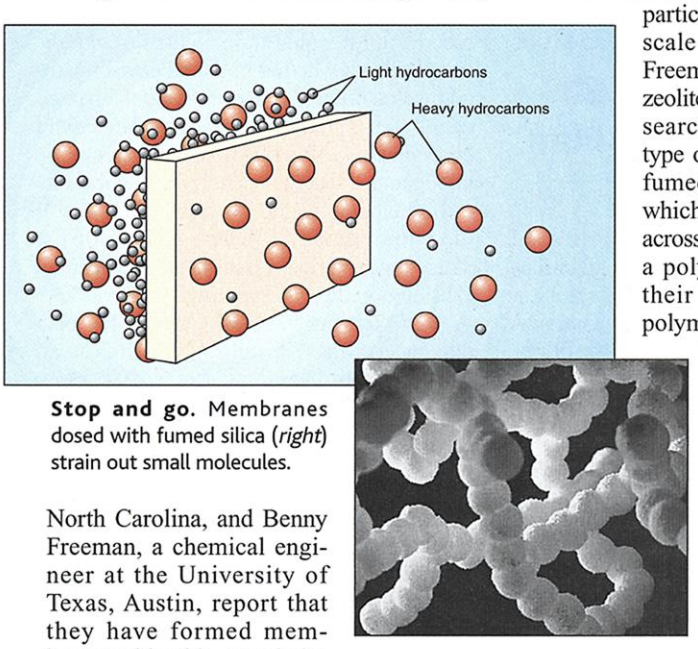
The 2002 allowed catch of 1780 beluga—a 39% decline from the average over the previous 4 years—is "sustainable and conservative," argues CITES Deputy Secretary-General Jim Armstrong. Critics are unimpressed. "I'm not at all convinced that they have a case," says Ellen Pikitch of the Wildlife Conservation Society. She hopes CITES officials change their mind before the main sturgeon harvest in the north Caspian commences in May.

Contributors: Richard Stone, Jeffrey Mervis

CREDITS: (TOP TO BOTTOM) DANIEL RYAN/NEWSPIX; HANS-JÜRGEN BURKARD/BILDBERG; CAVIAR EMPTOR

through, an energy-intensive and costly proposition. But now a team of researchers from the United States and Australia has found a surprising way out of the dilemma.

On page 519, the researchers, led by Tim Merkel, a chemical engineer at Research Triangle Institute in Research Triangle Park, North Carolina, and Benny Freeman, a chemical engineer at the University of Texas, Austin, report that they have formed membranes with wide-open holes that, paradoxically, allow large molecules through far more readily than smaller ones. Normally, enlarging a membrane's pores opens the gates to a flood of molecules, both large and small. The new membranes are both more selective and faster acting than previous versions.



Stop and go. Membranes dosed with fumed silica (*right*) strain out small molecules.

"This is a very interesting result" that could open new industrial uses for membranes, such as separating gases like oxygen from air, says Narcan Bac, a chemical engineer and membrane separations specialist at Northeastern University in Boston, Massachusetts. Bac adds that extending the same approach to other membranes may make current industrial separations cheaper. "Any time you can improve the efficiency of separations, you are improving the economics of the process," says Bac.

Merkel, Freeman, and their collaborators were aiming to get that efficiency boost by spiking a conventional membrane polymer with tiny particles. That combination isn't novel: For years, other groups had been adding small, porous particles called zeolites to membranes to try to increase their selectivity. Because zeolites come riddled with various-sized pores, they can serve as filters to allow slim molecules through while blocking their hefty cousins. But zeolite particles themselves are at least a micrometer across, making them "like giant boulders" compared with the polymer chains in the membrane around them, Freeman says. When the particles are added to polymer films, the tiny polymer building blocks pack tightly around the zeolites and produce dense films that make it difficult for gases to make their way through, leaving the hulking zeolites as the primary passageways through the membrane.

"We wondered what would happen if the particles were on the same size scale of the polymer chains," Freeman says. Because smaller zeolites weren't available, the researchers opted instead for a type of fine-grained sand called fumed silica, each particle of which was only 13 nanometers across, roughly the same size as a polymer chain. They mixed their fumed silica with rigid polymer chains, each akin to a strand of uncooked spaghetti. The small sand particles acted like meatballs strewn among the stiff spaghetti strands.

"That forced the polymer chains apart and increased the permeability" of the membrane, Freeman says. The arrangement gave the membranes an array of gaping holes, which by all accounts should sieve molecules quickly. The researchers braced themselves for the seemingly inevitable influx of chemical intruders.

It never came. In fact, the new membranes proved twice as good as previous versions at allowing larger gaseous organics such as benzene to pass through while straining out smaller gases such as hydrogen. The counterintuitive result, Freeman explains, occurs because molecules move through a membrane in two stages. First they must dissolve into the membrane, and then they must wiggle their way through it. And whereas smaller molecules are faster wigglers, larger molecules are quicker to dissolve. In densely packed membranes, that knack for dissolution doesn't turn large molecules into speed demons, because they still get hung up on their way through. But thanks to the wider holes in the new membranes, Freeman says, the bigger molecules have the elbow room they need to take full advantage of their head start and zip across before the smaller molecules.

The new membranes aren't perfect. One conventional membrane made from a polymer abbreviated PTMSP remains more permeable than the new variety. But PTMSP membranes degrade quickly in the presence of gaseous hydrocarbons such as methane, making them poor candidates for separating unwanted compounds from natural gas. The new hybrid version uses a far more stable polymer, abbreviated PMP. Merkel, Freeman, and colleagues are now testing whether their new membranes will separate out unwanted compounds commonly found in natural gas. If so, the hybrid membranes could open the door for energy companies to exploit vast natural gas reserves that currently harbor too many unwanted gases to be useful.

–ROBERT F. SERVICE

CREDITS: (TOP TO BOTTOM) ILLUSTRATION: C. SLAYDEN; BENNY D. FREEMAN/UT-AUSTIN; TOBY TALBOT/AP

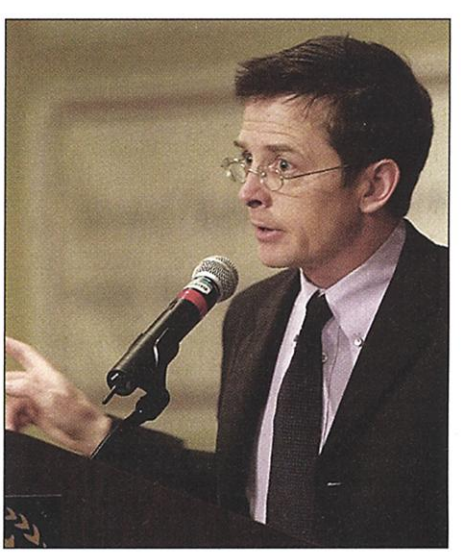
PARKINSON'S DISEASE

Coincidence or Connection?

When actor Michael J. Fox revealed in 1998 that he has Parkinson's disease (PD), it caused a stir: a celebrity in his prime afflicted with a degenerative disorder associated with old age. Now a new twist to the story has emerged, and scientists are debating what, if anything, it means. A Canadian TV documentary has reported that three people who worked with Fox at a TV studio in the late 1970s also have been diagnosed with Parkinson's. One, like Fox, first showed symptoms in her 30s.

The cluster of four cases out of a 125-person production crew may not have a common cause. Indeed, disease clusters often turn into scientific dead ends. But the two instances of the rare early-onset form, in particular, have experts intrigued. "When you start seeing young patients, the odds increase dramatically" that a cluster is not due to chance, says J. William Langston, scientific director of the Parkinson's Institute in Sunnyvale, California.

A handful of PD experts have known about the cluster for roughly a year. It first came to public light in a documentary, "The Parkinson's Enigma," aired last month by Canada's CTV. Fox and the three others had



Cluster conundrum. Three people who worked with Michael J. Fox in the late 1970s also have Parkinson's disease.