June 1999, p. 2083). Few people took either announcement seriously.

The latest pronouncement comes from a trio composed of Severino Antinori, a fertility expert at the Institute of Clinical Obstetrics and Gynaecology in Rome; Panos Zavos, a reproductive physiologist at the Andrology Institute of America in Lexington, Kentucky; and Avi Ben-Abraham, an American-Israeli biotechnologist whose current affiliation was not revealed. Speaking at a workshop at Antinori's institute, Ben-Abraham said that the team has "unlimited funding"—he declined to reveal the source—and plans to carry out the experiments in an undisclosed Mediterranean country. Ben-Abraham hinted that it could be Israel or an Arab nation, claiming that "the climate is more [receptive to human cloning research] within Judaism and Islam."

Fertile-minded. Severino Antinori says cloning could overcome male sterility.

The group wants to use cloning to help childless couples—particularly infertile men—start families. "Cloning may be the last frontier … in our attempts aimed at defeating male sterility," says Antinori, who is no stranger to controversy: In 1994, he used in vitro fertilization to impregnate a 62-year-old woman. The trio would attempt cloning only for childless couples in which the men produce no sperm, Antinori says. He claims to have 600 such couples on a waiting list.

One of the few scientific details of the project revealed at the meeting was that the group plans to follow essentially the same approach that was used to produce the sheep Dolly: Transplant a nucleus from a somatic cell into an enucleated egg and kick-start the process with a jolt of electricity. Zavos claims that the group has many scientists on board, including animal cloning experts; he refused to reveal their names, citing "security" concerns.

Jaenisch and others have denounced the effort. "What these guys are suggesting is ridiculous," he says, warning that the rare cloned mammals that survive from hundreds of fertilized eggs often suffer severe health problems. "Many die very soon after or have serious problems, such as kidney and brain abnormalities or no immune system," he says. There's no reason, Jaenisch adds, to think that such problems—seen in all five mammalian species cloned so far—won't affect human clones. Dolly's creator, Ian Wilmut of the Roslin Institute in Edinburgh, U.K., adds: "We had a lamb born recently which looked perfectly formed, but it couldn't stop hyperventilating; in the end we decided it was kinder to kill it. It turned out that the muscles and arteries leading to its lungs were malformed. I would like to know what they propose to do with a human in a situation like this."

The mother of a human clone might also be at risk. Mammalian clones are often extra-large, and pregnant mothers become dangerously swollen and frequently miscarry. Antinori's team claims that problems with embryo culture medium could be the cause of this syndrome, and that altering the medium's ingredients could avoid the complication. Wilmut acknowledges that's a possibility but says that until this problem is resolved, human surrogate mothers would be put at great risk. Jaenisch says epigenetic factors may affect a clone's health and account for the high rate of failure in bringing cloned embryos to term. "They cannot screen for epigenetic abnormalities in the same way they can screen for chromosomal aberrations," he says.

Undaunted, Antinori revealed that the trio would meet in October in Monte Carlo, Monaco, to fine-tune its plan; the researchers hope to start implanting embryos within 2 years. Said Zavos, "The genie is out of the bottle." –JOHN PICKRELL

GENDER EQUITY

NSF Program Targets Institutional Change

Huddled around a campfire in the Colorado Rockies last fall, 30 women engineers plotted how to improve conditions for their academic colleagues. Out of that meeting, part of a 3-day workshop, came the idea for a Women in Engineering Leadership Institute (WELI). The campers' timing couldn't have been better: Last month, the National Science Foundation (NSF) unveiled plans for a new $20-million-a-year program aimed at improving career prospects for women scientists and engineers in academia, and organizers of the nascent institute are already working on a grant proposal.

The competition may be fierce. WELI will be competing for one of five to 10 "institutional transformation" awards that NSF hopes to make by this fall as part of its new program, called ADVANCE. The program, which replaces NSF's earlier efforts to tackle the chronic problem of women being underrepresented in science, will also fund fellowships for women just starting or return-

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Purchasing Paralysis Rules meant to improve purchasing practices across the French government are stifling research, according to an Internet petition signed by more than 3200 French scientists. The guidelines, adopted over the last 2 years (*Science*, 12 March 1999, p. 1613), require all government-funded institutions to use only approved suppliers for purchases above $570; competitions are held at the beginning of each fiscal year.

The rules have put many researchers in a bind. Last month, for example, the autoclave in a microbiology lab at the University of Paris's Orsay campus broke down. But the only model that would fit through the lab's doors is made by a manufacturer that is not on the approved list.

Some help is on the way. The finance ministry earlier this month announced that, starting in September, it will triple the amount, now $43,000, that is exempt from the rules. (The Orsay lab had already reached that level.) But the lab would still have to wait 6 months to replace its autoclave. Such "paralysis of research activities is unacceptable," says Orsay microbiologist Betty Felenbok, a leader of the petition campaign (http://193.55.31.113). The petitioners want the bar for individual purchases raised from $570 to $2800 and no limit on purchases under that amount from unapproved suppliers.

Harvard's Catch Science advocates have a new and influential ally on the university scene. He's economist Larry Summers, named this week as the new president of Harvard University.

Summers, 46, who served as Treasury secretary in the Clinton Administration, became the university's youngest tenured professor at the age of 28. As part of the Clinton team, "he was an early and constant supporter of the need to keep the engine of intellectual capital going," says John Podesta, former White House chief of staff and now a professor at Georgetown University law school in Washington, D.C. Podesta says Summers pushed a number of research-related initiatives, from climate change to precollege education, during his stint in Washington.

Summers beat out University of Michigan chief Lee Bollinger and Harvard Provost Harvey Fineberg in the race to succeed Neil Rudenstine. He will take over on 1 July.

CREDITS: (TOP TO BOTTOM) MASSIMO SAMBUCETTI/AP; LAWRENCE JACKSON/AP

were participating in a dyslexia study) volunteered that they'd had trouble learning to read as children, Paulesu says.

Even though the Italian subjects were unaware of and unhindered by having dyslexia-like reading skills, under the PET scan they looked just like British and French students who struggled with reading. Compared to normal readers, dyslexics from all three countries showed less activation in parts of the temporal lobe while reading. The underutilized areas are familiar to neurologists: Patients with strokes in this area often lose the ability to read and spell, even though they still speak fluently.

The researchers aren't sure why the dyslexics seem to access this brain area less than normal readers do. Other PET studies and scattered neuropathological reports have led to speculation that, in general, dyslexics have fewer neural connections among cells in this region. Although most researchers think that's plausible, little consensus exists on more detailed explanations of how or why dyslexics' brains are different from those of normal readers, Olson says. His research suggests that genetic factors account for about half of someone's risk of developing dyslexia, although no single gene is likely to be to blame.

This research doesn't supply ready solutions for how to help dyslexic students overcome their reading disability, Paulesu says, short of moving to Italy, Turkey, or Spain, where spelling is simple and straightforward. So sympathize when English- or French-speaking students complain about having to memorize arbitrarily spelled words; they're right to feel wronged. –LAURA HELMUTH

CELL BIOLOGY

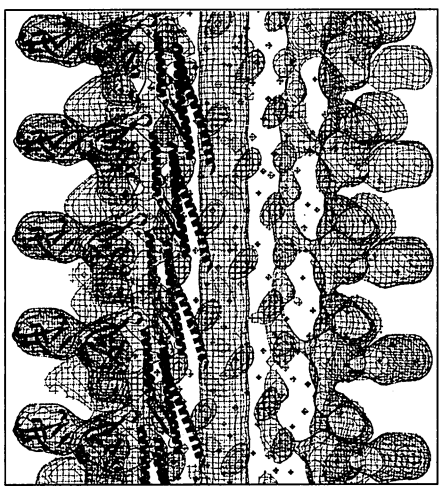
How Bacterial Flagella Flip Their Switch

Bacteria move with the agility of a tailback in American football, first cutting left, then right—all propelled by their whirling flagellar tails. Exactly how the tiny creatures achieve their feats of broken-field running has long been a mystery. New results now provide a probable solution to the puzzle.

When bacteria "run," the rotation of their flagella, long, whiplike filaments that project from the cells, is driven by motors located at the flagellar base in the bacterial membrane. The flagellar filaments are helical, and when they wind in the left-handed direction, they rotate counterclockwise. To change direction then, the bacterial cell momentarily reverses the direction of the motor, generating a torque on the flagellar filaments that flips them into right-handed helices. This causes the bacterial cell to "tumble," or change its orientation for its next run.

The mystery concerns how flagellin, the protein that makes up the filaments, achieves this dramatic structural shift. An x-ray crystallographic study of the protein described in this week's issue of *Nature* by Keiichi Namba of Matsushita's Advanced Technology Research Laboratories in Kyoto, Japan, Fadel Samatey of the Protonic NanoMachine Project, also in Kyoto, and their colleagues provides the first good look at a possible answer. It suggests that a sharp change within a very small "switch" region of flagellin is all that it takes to flip the left-handed flagellar helix into the right-handed form.

Previous structural studies, using the electron microscope and other methods, had characterized the bacterial flagellar filament to a resolution of 10 angstroms. These showed that



How they stack up. Five molecules of the protein flagellin are superimposed on a low-resolution map of a bacterial flagellar filament.

CREDIT: K. NAMBA/PROTONIC NANOMACHINE PROJECT/ERATO/JAPAN SCIENCE AND TECHNOLOGY CORP.

it is a tubular structure made up of 11 protofilaments, each formed by stacking together numerous molecules of flagellin. This protein comes in either left- or right-handed states, or L or R types, and all the molecules in a given protofilament are in the same state.

But the left- and right-handed protofilaments aren't just mirror images of one another. The repeat distance, which is the distance from any given point on one flagellin molecule to the corresponding point on the molecule above or below it, is less—by 0.8 angstroms—for the R-type protofilament. As a result, a flagellar filament containing both L and R protofilaments isn't straight but supercoils into a helix. For example, the *Salmonella* filament, which contains nine L-type and two R-type protofilaments, twists into a gentle left-handed helix. For tumbling, two of the L protofilaments are switched to the R type, and that's enough to give the filament a right-handed coil.

Researchers have long wanted to see this structural change, but that requires x-ray crystallography and they were stymied in their efforts because flagellin doesn't crys-

ScienceScope

Polytech Plum Glitzy it may not be, but Rensselaer Polytechnic Institute (RPI) in Troy, New York, has devoted admirers—including one who this week made a $360 million anonymous donation.

"A gift of this magnitude, fully unrestricted, is unprecedented," said RPI president Shirley Ann Jackson. She sees it as a vote of confidence for the Rensselaer Plan, a 5-year strategy to build stellar research programs in biotechnology—especially tissue engineering—and information technology.

Investing in Science It's a lovely problem for David Strangway, president of the Canada Foundation for Innovation (CFI). Strangway must choose between Triple-A bonds and blue chip stocks as the preferred investment vehicle for a $503 million gift from the government; the only catch is that it can't be spent until 2006–10.

The windfall is the third in the past year for CFI as the government whittles down a budget surplus (*Science*, 10 March 2000, p. 1732; 27 October 2000, p. 687). The CFI now has a war chest of $2.11 billion for competitive infrastructure grants to universities and teaching hospitals.

Although Internet stocks are definitely out, Strangway is still bullish on the prospects for solid growth. "I don't think it's unreasonable to hope that $500 million might become $670 million by the time it's needed," he says.

Dosage Details The main body that reviews U.S. gene therapy protocols plans to ramp up its scrutiny of safety reports despite complaints that it will reveal sensitive trade information.

Last week, the Recombinant DNA Advisory Committee (RAC) for the National Institutes of Health (NIH) approved a policy requiring detailed data on serious adverse effects from gene therapy experiments. The RAC has collected and made public such data for 10 years, but it wants to harmonize its requirements with those of the Food and Drug Administration (*Science*, 26 January, p. 572). A new RAC board will analyze the reports for trends. "We want to make the data more useful to everybody," says RAC chair Claudia Mickelson of MIT.

Too useful, says Michael Werner of the Biotechnology Industry Organization, who warns that forcing companies to reveal dosage levels "could be of enormous value to a competitor." The plan now goes to the NIH director.

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