cities," so the agency is "the logical home" for the NCI, says another NCI official.

In the meantime, Europeans are forging ahead with their own plans for an initiative that would plow $10 millon or more a year into the cities. At a meeting later this month in The Hague, Netherlands, they will join with U.S. and Japanese representatives to identify potential projects. "It will be an attempt to prioritize unmet problems," says Segal, and "to try to get countries to commit money." Leading the charge for a European NCI, announced last week at a RANSAC-sponsored meeting in Washington, D.C., is the Landau Network–Centro Volta in Como, Italy, a nongovernmental organization that supports scientific cooperation with the former Soviet Union. The Landau network will follow up discussions at The Hague with its own meeting with nuclear city officials next month in Rome.

If the European effort gets off the ground, it could play a vital role in supporting the nuclear cities until NCI recovers. "It's a daunting agenda," says Segal, "but one for which we'll never be forgiven if we fail."

–RICHARD STONE

GENETICS

Gene Skews Patterns Of Inheritance

In the eyes of Mendelian geneticists, all chromosomes are created equal. In anticipation of sexual reproduction, paired chromosomes split up so that each developing egg or sperm ends up with just one of the partners. In theory, both partners have the same chance of making it into the next generation. But in mice and some fruit flies, reality is not so egalitarian. Sometimes one chromosomal partner consistently wins out over the other, seemingly breaking one of the basic rules of genetics.

Last March, researchers at the University of Wisconsin, Madison, solved part of that mystery in fruit flies. They showed that early in sperm development, while partner chromosomes are still close together, a truncated protein encoded on one copy somehow prevents pre–sperm cells carrying the other from maturing (*Science*, 12 March, pp. 1651 and 1742). Now mouse geneticists have fingered the gene responsible for a similar phenomenon in mice.

Last week at the 13th International Mouse Genome Conference in Philadelphia, Bernhard Herrmann, a geneticist at the Max Planck Institute for Immunology in Freiberg, Germany, described a mouse gene, located on chromosome 17, that can also skew chromosomal inheritance patterns. This gene, which codes for a protein kinase enzyme, apparently works by altering the ability of mature sperm to swim to their target, the egg. (The results also appear in the 11 November issue of *Nature*.)

The finding solves "one of the oldest riddles in mouse genetics," comments John Schimenti, a molecular geneticist at The Jackson Laboratory in Bar Harbor, Maine. It might even have practical uses. Putting the gene on an animal's sex-determining chromosome can alter the sex ratio of its offspring, allowing farmers breeding dairy cows, for example, to produce almost all female calves. "You could save a lot of animals and at the same time enormously increase the productivity," Herrmann says.

Geneticists first noticed the unequal transmission of a then-unidentified chromosome in the 1930s while studying a mutation that produces tailless mice. Mendelian genetics predicted that when the males breed with normal females, 50% of the progeny should have short tails, as a result of inheriting one mutant and one normal copy of the gene. But the crosses produced far fewer short-tailed animals. "This was the first time people saw a distortion in the Mendelian ratio in mammals," Herrmann notes.

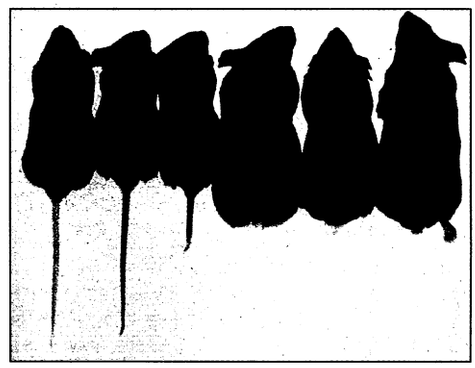
In 1984, Mary Lyon, a mouse geneticist at the Medical Research Council Laboratory of Mammalian Genetics in Harwell, England, took a stab at explaining this distortion after observing strange inheritance patterns of tail lengths in her breeding studies. She suggested that up to four genes had to be involved: one called the responder and as many as three others that she called distorters. She figured out that the responder reduced sperm fitness when not accompanied by distorter genes. As a result, both responder and the presumably closely linked tailless gene would be passed on less than 50% of the time. But when distorter proteins were present, Lyon predicted, the responder could counter their detrimental effects, skewing inheritance in favor of any chromosome carrying the responder. "It turns out that her model is correct," says Lee Silver, a geneticist at Princeton University.

Silver himself had gone looking for the responder gene, working with Schimenti. But although both they and Herrmann came up with candidates for the responder gene, neither panned out. Herrmann's gene, called *rsk3*, provided a lead to the right one, however.

The stretch of chromosome 17 where the *rsk3* gene is located has undergone several duplications and rearrangements. On a hunch, Herrmann decided to find out whether one of those rearrangements might have linked all or part of *rsk3* to the true responder gene. The hunch paid off.

The responder gene Herrmann found, called *Tcr*, consists of the partial *rsk3* gene fused to another gene that resembles genes for sperm-motility kinases, or Smoks. To make sure the new gene was the right one, the Max Planck group inserted it into various mouse chromosomes and showed that it does skew inheritance patterns. When present on the Y chromosome, for instance, the mice fathered far more than the normal 50% male progeny.

Herrmann thinks the responder gene handicaps sperm that carry it by causing their flagella to beat too slowly, while the distorter genes—whose identities are still unknown but which seem to be on the same chromosome—cause them to beat too fast. As a result, only the sperm lucky enough to get both



CREDIT: B. HERRMANN

Telltale tails. Less than the expected 50% short-tailed mice foretold the unusual inheritance pattern of mouse chromosome 17.

distorter and responder proteins move optimally and are able to beat out the sperm that lack either a responder or distorter.

The discovery in flies and mice of two very different genes that promote their own inheritance—and incidentally that of the chromosome they ride on—suggests that the evolutionary pressure to become such a self-promoter must be quite strong, says Silver. Successful transmission should lead to ever greater representation of that version of a chromosome in a population. Consequently, he adds, "there's probably thousands of examples out there that we can't see," perhaps even in people.

–ELIZABETH PENNISI

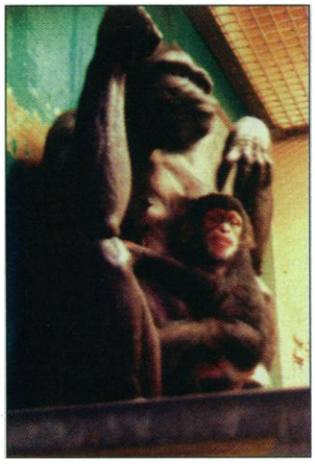
ANIMAL REGULATIONS

FDA Report Scores Chimp Research Lab

A federal investigation has found that the country's largest chimpanzee facility has violated dozens of regulations relating to good laboratory practices. The violations, described in a preliminary report detailing the results of an August inspection by the U.S. Food and Drug Administration (FDA), mostly involve inadequate record keeping, but they also include unapproved changes in experimental protocols. Animal activists who obtained the report claim that the irregularities raise questions about the integrity of trials involving potential new drugs and medical devices.

The Coulston Foundation, a private breed-

ing and research facility in Alamogordo, New Mexico, conducts research into AIDS, spinal cord injury, and vaccine development. It has long been a target of animal rights groups, most recently when the Air Force transferred 111 chimps, many of them descendents of animals used in the space program, to the facility. In September, the foundation agreed to give up 300 of its 600 chimps after the U.S. Department of Agriculture charged the lab with animal welfare violations related to the deaths of five chimpanzees (*Science*, 10 September, p. 1649). Last month the Center for Captive Chimpanzee Care was awarded custody of 21 of the Air Force chimps.



A watchful eye. Chimpanzee studies at The Coulston Foundation are under FDA scrutiny.

The lab irregularities are described in a 31-page report by an FDA investigator, who lists alleged infractions without comment. The report, obtained by In Defense of Animals (IDA), based in Mill Valley, California, states that laboratory workers kept inadequate records of some animal conditions, changed experimental protocols without proper approval, and failed to collect necessary tissue and urine samples. In one case, according to the report, three animals in a study lost approximately 20% of their body weight in a matter of weeks and another died. Despite this, the report states, no animals were removed from the study for medical reasons. Another item notes that there was no documentation of physical and neurological exams required by an experiment. The report also found violations in record-keeping requirements, including data and observations recorded on loose "scrap paper," and noted the use of "deteriorated or outdated reagents and solutions."

IDA says that the document highlights sloppy science by Coulston, which receives much of its support from the National Institutes of Health but also tests new products for pharmaceutical and medical device companies. "It's far more than just record keeping," says IDA's Eric Kleiman. "If a protocol calls for tissue samples to be taken and they're not, that could damage the whole study."

Coulston Foundation spokesperson Don McKinney says the lab has responded to the report with "foundation-wide changes" in record-keeping procedures to comply with FDA requirements. He says he does not believe the infractions jeopardize the validity of the three studies covered by the inspection, but "we always take these things very seriously." Coulston's top management, he says, met with quality-assurance and scientific staff to discuss the report.

James McCormack of the FDA's Bioresearch Monitoring Program declined to comment while the investigation is still active. However, in some other cases involving violations of good laboratory practices, the agency has ruled that affected studies could not be included in applications for drug or product approval. Punishments can range from a warning letter to disqualification of the facility. The agency is expected to issue a final report in a few months.

Other researchers who carry out clinical studies with primates say the report is likely to be a blow to the foundation even if it does not affect the results of specific studies. "Anytime FDA raises concerns ... it's a pretty serious matter," says virologist and immunologist Krishna Murthy of the Southwest Foundation for Biomedical Research in San Antonio, Texas, who has served as principal investigator on several primate studies subject to FDA approval. Bill Hobson, president of Sierra Biomedical in Sparks, Nevada, says he would be "surprised" if the research was compromised but that the report could have financial repercussions. "These things are open to the public, and our competitors use them" as ammunition when bidding for contracts, he says. **–GRETCHEN VOGEL**

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INTERNATIONAL COLLABORATION

University of Cambridge To Team Up With MIT

CAMBRIDGE, U.K.—When leaders of the Massachusetts Institute of Technology (MIT) gathered in their Cambridge, Massachusetts, offices to consider which top-notch European university might make the best partner for a broad research and education alliance, it is perhaps not surprising that they chose that other Cambridge, home to one of Europe's oldest and highest profile universities. And their choice may have been swayed by the fact that it's not going to cost them a dime. On Monday, Britain's Chancellor of the Exchequer Gordon Brown announced that the British government would invest more than $100 million over the next 5 years to help jump-start the new Cambridge-MIT Institute.

Brown was the principal architect of the partnership and first approached MIT leaders about 18 months ago, having been deeply impressed by MIT's track record in converting science into successful businesses. "If you look at what MIT has achieved in its time, it is actually quite frightening," a treasury spokesperson says, pointing at MIT's top ranking in patents awarded to U.S. universities and the more than 4000 companies it has spawned. MIT had been approached by several foreign institutions, but "the fit seemed to be best with the University of Cambridge," says Lawrence Bacow, chancellor of MIT.

The institute will not be built of bricks and mortar, but will make use of existing infrastructures. Staff and student exchanges, joint research and education projects, and adapting MIT's business programs to the United Kingdom are the main ingredients of the deal. The British government will provide about 80% of the total budget for the next 5 years through its Capital Modernization Fund, and private industry will chip in the rest.

Despite Brown's focus on what Britain has to gain, MIT insists it is more than a hired gun. "We'll get a lot out of it as well," says Bacow. "This relationship provides extraordinary resources [for MIT] and an opportunity to collaborate with the University of Cambridge in a lot of areas." Cambridge Vice Chancellor Alec Broers agrees: "This ties together two prime research institutions from two different environments, and that's the way the world will have to go. If you want to be at the forefront of the scientific endeavor, you've got to have an international outlook."

International ties between universities are not new, but what makes this alliance unique is its broad scope. Unlike some more focused collaborations MIT has embarked on, such as a pending deal between MIT's Media Lab and the Irish government that would create a $200 million information technology teaching center in Dublin, "faculty from all our five schools will be engaged," Bacow says. Whether the new institute delivers will be seen after the initial 5-year funding runs out, when spin-offs and licensing fees are expected to pay more of the bills. If everything goes as planned, Bacow expects a lot more Cambridge-to-Cambridge traffic by next spring.

–MICHAEL HAGMANN

Cementing the deal. MIT's Charles Vest, Gordon Brown, and Alec Broers (left to right).