parasite's life cycle," says Stephen Hoffman, a malaria researcher at the Naval Medical Research Center in Silver Spring, Maryland.

But does that phase serve a purpose? Rodríguez can only speculate. Perhaps the parasites like to shop around to find a "good" liver cell to infect, she says. Or maybe passing through multiple liver cells somehow activates the parasite, preparing it for the real thing. Rodríguez's first priority now is to find out why parasites show this behavior and how they do it. Watch for the sequel.

–MARTIN ENSERINK

CANCER RESEARCH

Preventing Hair Loss From Chemotherapy

The images are painful: a cancer patient, perhaps a child without hair, or a woman wearing a scarf or all-too-obvious wig to disguise the hair loss caused by chemotherapy. Although this loss may seem trivial—it's likely to be temporary and the chemotherapy may well save the patient's life—it's not. "After nausea and vomiting, one of the harder side effects of chemotherapy is loss of image," says cancer researcher Stephen Friend of Rosetta Inpharmatics in Kirkland, Washington. "Keeping that image intact," he adds, "has a lot to do with fighting the disease." Now, researchers may be on the way to developing a drug that can prevent chemotherapy-induced hair loss.

Many chemotherapeutic agents cause hair loss because they are aimed at rapidly dividing cells—one of the defining characteristics of cancer cells. The problem is that these drugs also kill normal dividing cells, including those of the hair follicle. On page 134, Stephen Davis and his colleagues at Glaxo Wellcome Research and Development in Research Triangle Park, North Carolina, report that they can prevent chemotherapy-induced hair loss in rats by rubbing the animals' skin with a newly developed drug before administering the chemotherapy.

The new drug targets an enzyme called cyclin-dependent kinase 2 (CDK2), which drives a key step in the cell division cycle. Many researchers in both industry and academe are looking for CDK inhibitors, mainly in hope of developing agents to block the growth of cancer cells. But William Kaelin of the Dana-Farber Cancer Institute in Boston, who is among those doing this work, points out that CDK inhibitors offer two possibilities. They can be used, he says, to find "either smarter ways to kill cancer cells or smarter ways to protect normal cells."

In the current work, the Glaxo Wellcome group focused on the latter goal. They began by determining the x-ray crystallographic structure of CDK2 bound to a previously identified, but relatively weak, inhibitor of the enzyme. They then used this structural information to design a modified form of the inhibitor that would bind more tightly to the enzyme, making it a more effective inhibitor, and that would also be suitable for topical application. Tests with cultured cells showed that their design strategy worked: The modified inhibitor blocked the division of the cells at just the point where CDK2 comes into play. What's more, Davis says, it "protected the cells from a panel of currently used chemotherapeutic agents."

The team went on to test the prospective drug in two animal models. In one, the researchers transplanted human scalp hair onto immunodeficient mice that can't reject the foreign tissue. When they applied the CDK2 inhibitor to the actively growing hair transplants, Davis says, it reversibly inhibited hair follicle cell division.

In the second model, the researchers treated newborn rats with the CDK2 inhibitor, followed by either the chemotherapeutic drug etoposide or a cyclophosphamide-doxorubicin combination. Control animals subjected to the chemotherapies without the CDK2 inhibitor lost all their hair. But when applied to the heads of the rats before they were given etoposide, the inhibitor completely prevented hair loss at the application site in 50% of the animals and partially prevented it in another 20%. It was less effective against the drug combination, protecting 33% of the animals from hair loss. But the researchers were thrilled to see the hair still growing on many treated animals. "There's nothing better than visual proof," Davis says.

Because the CDK2 blocker inhibits cell growth, the team checked to see whether it interferes with the ability of the chemotherapeutic drugs to kill cancer cells in animal tumor models. Davis says that they didn't detect any such interference, and the fact that the drug is applied externally should also limit any potential

Hair preserver. The CDK2 inhibitor, when rubbed on the heads of mice (bottom), prevented the hair loss caused by etoposide.

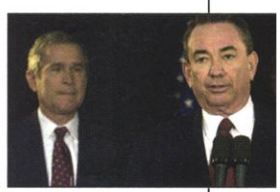
CREDITS: (LEFT TO RIGHT) S. DAVIS *ET AL.*; KENNETH LAMBERT/AP

ScienceScope

THE YEAR TO COME

With a new U.S. president and a host of hot global R&D issues in play, 2001 should be an eventful year for science. A few areas to watch:

Decisions, Decisions The incoming George W. Bush Administration has many R&D–related choices to make, including picking a White House science adviser and deciding biomedical research policy. At the **National Institutes of Health** (NIH), observers are wondering what the selection of Wisconsin Governor Tommy Thompson (right) to head the Department of Health and Human Services will mean for research using **stem cells** derived from human embryos. Last August, the Bush campaign criticized NIH's plan to fund such work, but Thompson's appointment has cheered some scientists. Although antiabortion groups that oppose stem cell funding consider Thompson an ally, he has praised groundbreaking stem cell work by scientists in his home state.



Antiabortion politics could also complicate the selection of a **new NIH director,** prompting some observers to recall a similarly prolonged hunt during the last Bush presidency. Whoever succeeds Harold Varmus, who left 13 months ago, will have to satisfy both conservatives and moderates. Also look for new heads at two institutes—eye and neurological disorders—and at the Office of AIDS Research.

At the **National Park Service,** Bush has pledged to undo a Clinton-era shift that sent the agency's 100 research scientists to the U.S. Geological Survey. Bush wants to return them to shore up protection for park resources.

Pay Hikes Look for the **National Science Foundation** (NSF) to propose higher stipends for graduate students and postdocs in its 2002 budget request, due out early this year. NSF officials calculate that it will take $52.4 million to raise postdoc pay under research grants to $40,000, a 45% hike, and another $30 million to boost grad student stipends from $18,000 to $25,000.

Director Rita Colwell is also hoping to launch a math initiative in 2002 that would triple or quadruple the division's current $130 million budget over 5 years. NSF is also searching for a catchy name for a social science initiative that it hopes to begin in 2003. "It's got to have 'human' in it, be short, and include the idea of technological change," says NSF's Norm Bradburn.

BRAZIL

Society Seeks Legislative Aide Fellow

RIO DE JANEIRO—Brasilia is far from the scientific centers of Brazil, but as the nation's capital it is the nerve center of government. The country's scientific establishment wants to stimulate the central synapses with a fellowship program that would begin to provide legislators and federal officials with the scientific expertise they need to carry out the nation's business.

The new program is the brainchild of the Brazilian Society for the Advancement of Science (SBPC), a membership organization

Science search. SBPC's Glaci Zancan seeks a "special person" to work with national legislators.

CREDIT: BRAZILIAN SOCIETY FOR THE ADVANCEMENT OF SCIENCE

with a small staff based in São Paulo. Modeled after the long-running congressional science fellowship program run by the American Association for the Advancement of Science (which publishes *Science*), it's seen as a way to inject a scientific viewpoint into political debates without the taint of personal gain.

"Yes, it's lobbying, but in the right sense," explains Aldo Malavasi, SBPC's secretary-general, using a word that is traditionally associated here with under-the-table payoffs. "The idea is to provide legislators with information that will help them make decisions that involve aspects of science and technology," says Malavasi, a researcher at the Institute of Biosciences at the University of São Paulo.

The society is hoping to find a senior scientist willing to spend a year away from research, in Brasilia, responding to legislative queries and filing quarterly reports. The concept has been endorsed by the parliament's Commission on Science and Technology, says SBPC president Glaci Zancan, noting that the commission would like to have additional expertise on hand during debates over scientific and technical issues.

The society is offering a stipend of $2000 a month and a generous travel allowance. Zancan hopes to select someone next month and have that person on the job in March, but she acknowledges that it might not be easy to find the right candidate. "We are looking for a senior researcher with a great capacity for communicating science to legislators and the public," says Zancan, a researcher with the Department of Biochemistry and Molecular Biology at the Federal University of Paraná. "It will take a special person." **–CASSIO LEITE VIEIRA**

Cassio Leite Vieira is a science writer in Rio de Janeiro.

MEDICAL RESEARCH

NIH Kills Deal to Upgrade Heart Data

BOSTON—What was heralded as a new model of public-private collaboration in medical research suffered a surprise reversal last week. A controversial plan to use private capital to upgrade a valuable public database collapsed amid concerns that it would cede too much control to a for-profit company. Boston University (BU), which runs the venerable Framingham Heart Study, and the National Institutes of Health (NIH), which funds the 52-year-old effort, instead will try to put together a nonprofit consortium in the coming year to modernize the massive database.

The decision, announced in a 26 December joint letter to the study participants, deals a mortal blow to Framingham Genomic Medicine Inc. of Framingham, Massachusetts, which was raising money to organize, digitize, and analyze the Framingham data. The company planned to repackage and sell data to the pharmaceutical industry (*Science*, 30 June 2000, p. 2301). The NIH decision also is a disappointment to BU, which was instrumental in forming the company. But the participants knew it would be risky: "There just wasn't a precedent for doing this," says Aram Chobanian, dean of BU's medical school.

The study has monitored the health of more than 10,000 people in the small town of Framingham during the last half-century, and it offers a treasure trove of data for researchers. But much of it is stored in boxes or file cabinets. NIH has been reluctant to put up the millions of dollars needed to update and upgrade the database, so BU hit upon the idea of getting a private company to do it instead. Its proposal, announced to the Framingham participants in April, raised tough ethical issues, ranging from questions about how outside scientists would get access to the revamped data to whether personal medical data collected with public money should be sold to private companies.

Ultimately, negotiations between BU and the National Heart, Lung, and Blood Institute foundered on how to balance scientific access to the data with the company's proprietary interests. "BU was under some pressure from the company to reach an

ScienceScope

Defining Animals Biomedical science backers and animal-welfare groups are preparing for a congressional scuffle over research rodents. Last year, the U.S. Department of Agriculture moved to regulate the use of **laboratory rats, mice, and birds,** which constitute 95% of all research animals, after activists won a lawsuit. But Congress temporarily blocked the rules at the behest of some research groups, who said regulation would be too expensive (*Science*, 13 October 2000, p. 243). Animal-welfare groups are mobilizing against a push to permanently block the rules. Predicts one congressional aide: "The fur is going to fly."

Help Wanted France is looking for a **new director of research.** The main man behind the scenes at the French research ministry, geophysicist Vincent Courtillot, says he plans to quit soon. In a note to his staff, Courtillot explained that after nearly 4 years of "passion, joy, and stress," it was time to return to his Paris laboratory at the Institute of the Physics of the Globe.

Forecast: Cloudy More fights over food and climate are coming. Last month, an expert panel formed by the European Union and the U.S. recommended stricter regulation of **genetically modified (GM) foods,** and its report could help make GM food safety reviews mandatory, rather than voluntary, at the U.S. Food and Drug Administration. The group also urged labeling GM foods, but it's unlikely the Bush Administration will go along. Still, market forces may rule: Already, some U.S. grain processors are separating crops so they can sell non-GM products in Europe.

Meanwhile, the new Administration is also unlikely to support international efforts to put teeth into the Kyoto global warming treaty. Negotiations collapsed last year after the U.S. objected to demands by European nations to stiffen emissions-trading requirements.

Boosting Science In Japan, science planners will launch **a drive to raise government R&D spending** from 0.7% of gross domestic product to 1%. The increase, which an advisory group calculates would cost about $218 billion over 5 years, would bring Japan's public-sector spending more in line with that of the U.S. and Europe, says Hiroo Imura, a key government science adviser. The target has not been formally adopted by the government, says Imura, "but we're hopeful."

Contributors: The *Science* News staff