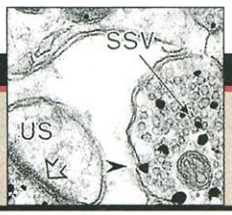

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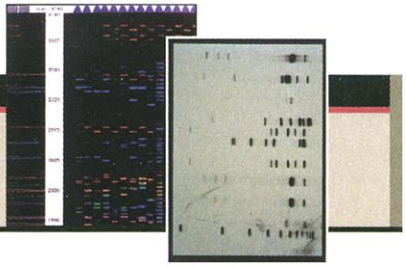
Glutamate transporter found at last

LEAD STORY 850
Special Report: Forensic science



Again, Fulhorst found genetic traces of the virus; he is now trying to isolate the agent itself from the samples—a task that could take a couple of weeks. But with one case nailed down and strong evidence in two others, the researchers did not want to wait to go public. "A new patient may be walking into the hospital next week," says Fulhorst.

"From what I've seen, the data look pretty compelling," says Thomas Ksiazek, acting chief of CDC's Special Pathogens Branch. Although the disease doesn't seem to pose a big public health threat, he says, CDC plans to step in by developing new diagnostic tests and disseminating them to state labs, and by putting together a case definition so that doctors will know what to look for when they see possible new patients. The agency will also assist in finding out how widespread Whitewater Arroyo infections may be by looking at old blood and tissue samples from California and other states, says Ksiazek. Meanwhile, the one confirmed case emphasizes the importance of avoiding rodent-infested places or taking precautions to prevent exposure to rat urine—a CDC warning already in place since the Sin Nombre virus, a hantavirus, was discovered after an outbreak in 1993. Since then, more than 250 people have come down with hantaviruses.

The new finding also drives home a point infectious-disease experts have been making for years: If they have the resources to monitor for new viruses and track their distribution before they cause disease, researchers are much better prepared when an outbreak does occur. During the 1993 Sin Nombre outbreak in the Four Corners area, says Fulhorst, no one had a clue what the causative agent was, and a small army of epidemiologists, microbiologists, and toxicologists was sent in to find out in a rush. Only afterward did researchers realize that the Sin Nombre virus had been around, occasionally killing people, for years. "With this one, it's exactly backward," says Fulhorst. "We said we thought there may be arenaviruses out there; we showed they were in the rats; and now we're saying they're causing disease."

There may be much more to discover this way. During his rodent surveys, Fulhorst says he found a third North American arenavirus, this one in deer mice in California. The agent, whose discovery hasn't been published yet, has been called the Bear Canyon virus; whether it makes people sick is, at this point, anybody's guess. **–MARTIN ENSERINK**

AGRICULTURAL BIOTECHNOLOGY

Monsanto Donates Its Share of Golden Rice

Monsanto Co. has agreed to provide royalty-free licenses to speed up work on a genetically modified rice that could alleviate vitamin A deficiency around the world. Researchers welcomed last week's announcement, but warn that a thicket of intellectual property claims surrounds the technology and that significant legal hurdles remain before the rice can become widely available to farmers in developing countries.

"Monsanto is the first company with the good will to offer this technology free for humanitarian purposes," says Ingo Potrykus, a plant molecular biologist at the Institute for Plant Sciences of the Swiss Federal Institute of Technology in Zurich. "I hope I can use this to convince other companies to give up their intellectual property rights," adds Potrykus, who developed the variant in collaboration with Peter Beyer of the Center for Applied Biosciences at the University of Freiburg in Germany (*Science*, 13 August 1999, p. 994; and 14 January, p. 303). Monsanto CEO Hendrik Verfaillie says his company, a subsidiary of Pharmacia Corp., is taking this step "to minimize the time and expenditure associated with obtaining licenses needed to bring 'golden rice' to farmers and the people in dire need of this vitamin."

Potrykus's team transferred into rice the multiple genes needed to create a synthesis pathway for β-carotene, which the body converts into vitamin A. It marked the first time a trait requiring multiple genes had been transferred into a plant. The enriched rice, which has a golden hue, promises to help alleviate a widespread public health problem: vitamin A deficiency, which afflicts 400 million people and can lead to vision impairment and increased susceptibility to disease.

Before the promise can be realized, however, the β-carotene pathway must be transferred to the different varieties of rice grown in each region. Potrykus's group has tried to hasten the process by offering to make its germ plasm and related technology freely available. The offer drew interest from several national rice research labs, as well as the International Rice Research Institute (IRRI) in the Philippines.

But claims of intellectual property rights have kept the technology bottled up in Potrykus's lab. Two outside studies have found that between 25 and 70 proprietary techniques and materials are involved in the gene transfer. Potrykus says Monsanto's most important claim is on the 35*S* promoter, which boosts the expression of the genes introduced into the rice. That change makes possible a high level of β-carotene synthesis.

But other important pieces of the puzzle lie outside Monsanto's control. Incorporated into the golden rice, for example, are two "bits of DNA" acquired, says Potrykus, under separate agreements that require the donors' consent to be passed on to third parties. The agreements have prevented him from distributing the germ plasm to any of the rice breeders interested in working with it.

Potrykus has spent a year negotiating with the two companies that hold rights to the DNA to enable the technology to be used by public-sector research groups. He declined to identify the companies to avoid jeopardizing what he calls a "delicate stage" of the negotiations, which he hopes will be concluded "within 2 months." Potrykus and others hope that Monsanto's announcement—made at an agricultural

CREDIT: MONSANTO CO.

Golden gift. Monsanto is making available its technology on new, vitamin-rich rice aimed at improving nutrition in the developing world.

biotechnology symposium in Chennai, India—will set a precedent for companies with a stake in the necessary technologies. "It may encourage others to work to cut through some of the red tape," says Ronald Cantrell, IRRI's director general.

Last week Monsanto also announced progress on its earlier promise to make public a draft of the sequence of the rice genome unveiled this spring in a collaboration with Leroy Hood, then at the University of Washington, Seattle, and now president of the Institute for Systems Biology in Seattle (*Science*, 14 April, p. 239).* The data have already been transferred to Japan's Rice Genome Research Program (RGP), which is the lead agency for the International Rice Genome Sequencing Project (IRGSP). The Japanese group will pass the Monsanto data to other IRGSP members once legal issues are resolved. Takuji Sasaki, RGP director, says that the Monsanto data, although "rough," should hasten completion of the sequencing project, whose status will be discussed next month at a meeting in South Carolina. **–DENNIS NORMILE**

With reporting by Elizabeth Pennisi.

* Registered researchers will be able to access the sequence data at www.rice-research.org

PUBLIC HEALTH

Gates Foundation on Big Funding Spree

For Eleanor Riley, an immunologist at the London School of Hygiene & Tropical Medicine, it must have felt like Christmas in July. The source of her midsummer cheer: $40 million from the Seattle-based Bill and Melinda Gates Foundation. "I'm absolutely delighted. This is at least 10 times [the amount of grant money] I would have expected for my entire career," says Riley, who last Monday received the funding for a 5-year project to develop and test new ways of fighting malaria.

But the grant for Riley and her colleagues was only one slice of the high-calorie funding cake—worth almost $200 million in all—that the cash-brimming Gates Foundation dished up for scientists in various fields late last month. Other beneficiaries are tuberculosis specialist Jim Yong Kim of Harvard Medical School in Boston, who received almost $45 million to develop a program to control multidrug-resistant tuberculosis (MDR-TB), and Alfred Sommer of the Johns Hopkins University School of Hygiene & Public Health in Baltimore. His $20 million grant "came at a very critical time," Sommer says. "We are just in the process of starting—and can now scale up—four large field projects in Nepal, Bangladesh, India, and Zanzibar" to study how cheap vitamin and mineral supplements can reduce maternal and child mortality in developing countries.

The grants for research into malaria and TB are the third big chunks of money the Gates Foundation has lobbed into the fight against these major killers within the past year. The foundation—one of the world's largest science-funding philanthropies, with assets of more than $20 billion—kicked off its spending spree in mid-July at the XIII International AIDS Conference in Durban, South Africa (*Science*, 14 July, p. 222), by announcing several AIDS/HIV-related grants totaling $90 million.

With the new money, Riley and her colleagues intend to expand research into new drugs and insecticides and to set up centers of excellence in malaria-endemic areas of Africa. "We hope the Gates money is acting as some sort of catalyst to bring other partners on board," Riley says. Meanwhile, Kim and his team—in collaboration with the World Health Organization, local health authorities, and other partners—are gearing up to develop a multidrug treatment program for MDR-TB patients in Peru. "This will have an enormous impact," Kim says, noting that the treatment protocol will be adaptable to other developing countries.

Even greater largesse may be in store. At the July G-8 meeting in Japan, leaders of the world's economic heavyweights resolved to halve the death toll of malaria, TB, and HIV by 2010. "There are rumors that the European Union will announce a major new investment this fall," Kim says. Until the noble words are backed by cash, the Gates money is paving the way. **–MICHAEL HAGMANN**

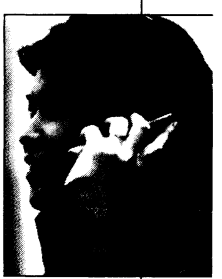
THE JULY FUNDING SPREE BY THE GATES FOUNDATION

Amount	Recipient	For what
$40 million	London School of Hygiene & Tropical Medicine	Develop new treatments and preventive measures for malaria
$44.7 million	Harvard Medical School	Develop a model for controlling multidrug-resistant tuberculosis
$20 million	Johns Hopkins School of Hygiene & Public Health	Improve Third World maternal and child health with micronutrient supplements
$90 million	Various institutions	AIDS/HIV

CREDIT: DAISUKE MORITA/PHOTO DISC

ScienceScope

Cells and Cell Phones The government is teaming up with the cell phone industry on studies aimed at settling the debate over mobile phone risks. The Food and Drug Administration (FDA) last week convened a multinational scientific panel to set research priorities for the $1 million program, which is backed by the Cellular Telecommunications Industry Association (CTIA). Studies have suggested that microwave radiation from cell phones can cause "micronucleation," a process in which cells form small additional nuclei that could indicate chromosome damage. To better understand micronucleation, the panel recommended funding animal experiments and investigating cellular response to microwave radiation. The FDA will send final recommendations to the CTIA within 2 months.



Polling Panned Should Lawrence Livermore National Laboratory use government funds to improve its public image? The Department of Energy's (DOE's) inspector general doesn't think so. Last month, lab officials announced that a poll of 600 people in the San Francisco area revealed a "favorable view" of the weapons lab, despite press coverage of security problems, discrimination allegations by women and Asian Americans, and massive cost overruns in a laser project.

But in a 19 July report, DOE Inspector General Gregory Friedman concluded that "the use of taxpayer dollars for this kind of exercise is questionable." He recommended that DOE officials review whether the University of California, which manages Livermore, should be allowed to bill the government for the $24,000 poll, and find out whether other DOE labs have funded similar image-polishing efforts. Livermore officials say the poll, the fourth they have funded over the last decade, was needed to guide "communications efforts."

Supergrant The Pittsburgh Supercomputing Center (PSC) has won a $45 million competition to build one of the world's fastest civilian science computers. The National Science Foundation (NSF) announced last week that a PSC-led team that includes the University of Pittsburgh and Carnegie Mellon University will host its new Terascale computer, to be built by Compaq. The machine, which will eventually complete 6 trillion operations per second, is expected to be online by early 2001. NSF hopes to fund a second terascale machine next year, but Congress has yet to approve funding.