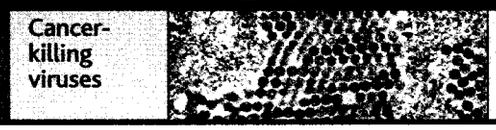
1243 Intimate look at the typhus organism



1244 Cancer-killing viruses

1247 Dinomania gives research a charge

York Times earlier this year.

Holt didn't dwell on his scientific credentials during the campaign, and as a freshman from the minority party he is unlikely to have a significant impact on national science policy. But he did claim "technical expertise that is so rare in Congress and political expertise that is so rare in science." He promises to be a "strong advocate for R&D" but declines to say whether he is seeking a seat with direct responsibility for science policies or spending. He also knows that his narrow win marks him as vulnerable in the 2000 campaign. "There are a dozen Republicans already thinking about running against me," he says. "I say, bring 'em on." **–DAVID MALAKOFF**

DEVELOPMENTAL BIOLOGY

Understanding of Ears, Bristles Jumps a Notch

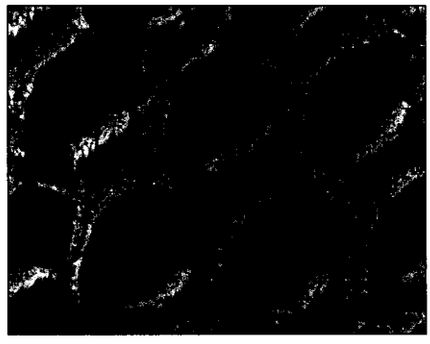
The arrangement of cells in the inner ear, which allows a music lover to sense harmonies, is itself as complex as a Bach fugue. It is orchestrated during development when precursor cells in the inner ear organize into a mosaic of sensory patches made of hair cells, which sense vibrations, neurons, which send messages to the brain, and supporting cells. In the December issue of *Development*, researchers describe part of the system of molecules that creates this intricate pattern. In an example of evolution's tendency to reuse basic mechanisms, it turns out to be the same system that guides the development of a much simpler sense organ in the fruit fly.

Developmental biologist Julian Lewis of the Imperial Cancer Research Fund in London and his colleagues demonstrate that proteins called Delta and Notch, already known to help pattern the vibration-sensing bristles on a fly, control the development of the hair cell mosaic in the inner ear of zebrafish and chicks. Other evidence from mice, which developmental biologist Matthew Kelley of Georgetown University has presented at several meetings, suggests that the same proteins are at work in mammalian ears as well.

Lewis's work "begins to give us an idea of the molecular pathways that govern the development of the mosaic," Kelley says. And it may eventually have clinical applications: In mammals, including humans, damaged hair cells are lost for good, but birds can regenerate them. Understanding how the cells develop in the first place "begins to give us insight into the pathways that prevent regeneration," Kelley says.

Delta and Notch are powerful determinants of cell fate in both the fly and in vertebrates. For example, as a group of vertebrate pre-neuronal cells matures, one cell gets slightly ahead of its cousins. Delta, which is lodged in the cell's membrane, interacts with the Notch receptor on neighboring cells, preventing them from becoming neurons. In the developing fly bristle—a miniature sense organ on the fly's head and body, which is made of a neuron and accessory cells—Delta-Notch signaling seems to work in a similar fashion to determine which precursor cells become neurons, bristle shafts, and supporting cells.

Because of the similarities between bristle and hair cell structure and function, scientists had suspected that the inner ear might also use Delta-Notch signaling in development. To find out, Lewis, Julie Adam, Anna Myat, and their colleagues looked for expression of the *Delta* gene in the ears of chick embryos. A few hours before the first neurons appear, the scientists found *Delta* expressed in scattered cells. Several days later, *Delta* was expressed again at just the site where the mature hair cells appeared a few hours later. By the time the hair cells were recognizable, Delta had nearly disappeared, but the two bouts of *Delta* expression are "strong evidence" that *Delta* guides neuron and hair cell development, says developmental neurobiologist Jeffrey Corwin at the University of Virginia, Charlottesville.



Hearing aid. During development, chick inner ears (*above*) and fly bristles (*top*) are both patterned by the Notch protein.

In a second paper in the same issue, Lewis, Catherine Haddon, and their colleagues suggest that a similar process also controls ear development in the zebrafish. They examined the embryonic ears of a mutant zebrafish called *mind bomb*, so named for its excess of neurons. No one has yet pinpointed the gene responsible for the fish's bumper crop of neurons but researchers think that the mutation somehow blocks Delta-Notch signaling. Sensory patches in the inner ears of *mind bomb* fish become "wall-to-wall hair cells," says Lewis, with no visible supporting cells—every cell becomes a hair cell.

Given that fly bristles and ear hair cells do basically the same thing and use the same developmental genes, Lewis and his colleagues propose that they may have evolved from a common ancestral sensory structure. But Corwin isn't so sure. Delta-Notch signaling is so common that "it may be like a subroutine in computer programming that evolution uses over and over," he says. So it's possible, says Corwin, that evolution reused the system in unrelated organs.

However the system evolved, understanding it may be useful. After chick inner ear cells are damaged, they express Delta as they regenerate, according to developmental neurobiologists Edwin Rubel and Jennifer Stone at the University of Washington, Seattle. These findings, under review at *Development*, may bring scientists a little closer to the day when "we will be able to restore hair cells in the human ear," says Rubel—an achievement that may allow today's headbangers to enjoy Bach in their old age.

–GRETCHEN VOGEL

COMPUTER SCIENCE

Microsoft Picks Beijing For New R&D Lab

BEIJING—Microsoft Corp. is making a major research investment to help it capture and retain a large chunk of China's fast-growing computer business. Last week, the software giant announced that it will open a research center in Beijing, and it pledged to spend $80 million over 6 years to make computers more user friendly for speakers

CREDITS: (LEFT) EDWIN RUBEL/UNIVERSITY OF WASHINGTON, SEATTLE; (RIGHT) R. TURNER/INDIANA UNIVERSITY

of Chinese, including voice recognition, information retrieval, and machine translation systems. The long-term, fundamental research will be "China oriented," says Kai-Fu Lee, managing director of the lab, which will be known as Microsoft Research (MSR) China.

The Beijing facility is the second overseas venture established by Microsoft Research, a $200 million division of the Redmond, Washington–based company. In June 1997, it opened its first such facility in Cambridge, England (*Science*, 20 June 1997, p. 1783). The two sites, together with two U.S. labs, employ some 300 scientists working in such areas as speech recognition, databases, user interfaces, and three-dimensional (3D) graphics.

The Beijing center will occupy 3000 square meters on the sixth floor of an office building in Zhongguancun, an area already home to dozens of research institutes of the Chinese Academy of Sciences and not far from Beijing and Tsinghua universities. The northwestern suburb is also known as a Chinese version of "Silicon Valley" for its concentration of computer and electronics companies. The new lab is expected in 3 years to grow from a half-dozen employees to around 100 researchers. "The strength of China's economy and the quality of its academic system" were major factors in choosing the location of the new lab, says Jack Breese, assistant director for Microsoft Research.

Lee, former president of Cosmo Software, the multimedia software business unit of Silicon Graphics Inc., joined Microsoft in July to head the new Beijing facility. He has been a pioneer in the areas of speech recognition, artificial intelligence, 3D graphics, and multimedia. Born in Taiwan and raised in the United States, Lee, 37, received his Ph.D. in computer science at Carnegie Mellon University in Pittsburgh, where he helped to develop a speech-recognition system that doesn't have to be trained to respond to a particular voice as well as a program for Othello, a board and computer game, that defeated the human world champion.

MSR China hopes to expand Microsoft's ties with China's computer science community by sponsoring international seminars, supporting journals, funding academic studies, setting up links to universities around the world, and hiring Chinese students after they have finished their studies abroad. "Our research will be focused on forward-looking studies" that should appeal to the best students, Lee says.

China is the fastest-growing information market in the world, says Lee, with 30% annual growth rates for PCs and estimated sales of 8.3 million in 2000. Earlier this year the company opened the Greater China Regional Support Center in Shanghai, and its efforts to upgrade Windows CE, an operating system for handheld computers, mark the first time Microsoft has formed teams in both China and Redmond to tailor products for the country. The company also has an agreement with the Ministry of Information and Industry to promote its products on the Internet in China, and it recently signed agreements with six large Chinese software companies to bundle Windows NT and SQL, for database management, into their business applications. **–JUSTIN WANG**

Justin Wang writes for *China Features* in Beijing.

CREDIT: ESA

SOCIAL SCIENCES

Canada Opens Program To Community Groups

OTTAWA—Canada's research granting councils traditionally channel funds into the academic community. But last week one of them took the revolutionary step of making public-interest groups eligible for grants from a new research program to attack such societal problems as poverty, illiteracy, and poor health.

The new activity, called Community University Research Alliances (CURA), is being funded by the Social Sciences and Humanities Research Council (SSHRC), one of the country's three major funding councils. Over the next 2 years, SSHRC will make 3-year, $160,000 awards to 16 centers that will plant the seeds for what the council hopes will grow into a national network of university and community researchers working on projects that serve local needs in the social sciences. Council president Marc Renaud says that making community groups eligible is the only way to make them feel like "true partners" in the venture, which is modeled after a long-running program in the Netherlands. "If partners means that it's always the university that calls the shots, that controls the budget, and that gives resources free of charge to these projects, then maybe we're not talking about real partners," Renaud says.

The very notion that community groups can apply for research grants intrigues Montreal social activist Alice Herscovitch. As director of Project Genesis, an advocacy group for the poor and elderly, Herscovitch has often served in an advisory capacity on collaborative projects with universities. But the experience has been less than satisfying. "Being part of an advisory committee means you have absolutely no input or, if you really push, very little," she says. "The process, the analysis, and even the final results—we don't have access to them."

Keven O'Brien, head of Canadian Feed

ScienceScope

U.K. PANEL TO VET GENE TESTING

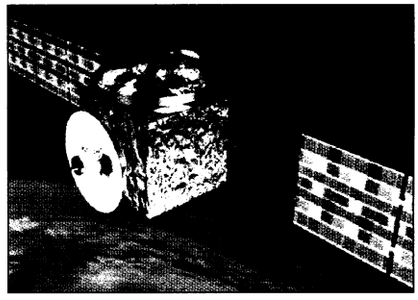
The British government is taking steps to prevent insurance companies from discriminating against people who have had genetic testing. Critics worry that insurers may use the tests, which can reveal who carries genes that increase disease risks, as an excuse to jack up policy prices or deny coverage to those carrying "bad genes."

Government officials announced last week that they will work with insurers over the next year to devise a scheme for reviewing test reliability and the fair use of results in policy pricing. The initiative, led by the government's Advisory Committee on Genetic Testing, will also establish an appeals process for those who believe insurers have discriminated against them.

"People are waiting to see flesh on the bones of these proposals," says Martin Bobrow, a medical geneticist at the University of Cambridge. "A lot will depend on who is on the evaluating committee and how the appeals process works."

MORE SPACE MISSIONS IMPERILED BY RUSSIAN WOES

Russia's economic woes are threatening to derail three more high-profile space science projects. Just a month ago, the United States moved to save the international space station by launching what could end up being a billion-dollar bailout of its ailing Russian partners. Now it is the European Space Agency (ESA) that must ponder how to pay for planned missions if Russia proves unable to provide promised Proton launch vehicles and other support.



Derailed? Mars Express.

The threatened missions are Mars Express, which would map the Red Planet and hunt for water beginning in 2003; Integral, an x-ray observer scheduled for a 2001 launch; and Spectrum-X-Gamma, a long-delayed astronomy platform now slated for launch in 2001.