

Health & Science



Scientists Discover Malaria's Immune Escape Genes

Scientists at the National Institute of Allergy and Infectious Diseases (NIAID) and their colleagues in California and the United Kingdom have uncovered the key to how the most common and deadly species of human malaria parasite escapes immune detection and causes a lethal syndrome of coma and death.

Each year, between 300 million and 500 million people develop malaria and up to 1 million—mostly young children in tropical Africa—die, according to the World Health Organization (WHO).

In three back-to-back reports in the July 14 Cell and one paper in the July 18 Proceedings of the National Academy of Sciences, the scientists describe a newly identified family of thousands, perhaps millions, of genes

that encode proteins critical to the development and persistence of *Plasmodium falciparum* malaria. "The lack of specific information about these genes has been a major roadblock to research on malaria," says Louis H. Miller, M.D., chief of NIAID's Laboratory of Parasitic Diseases (LPD) and senior author on one of the papers.

The proteins made by these genes allow the parasite to survive in red blood cells and enable the infected cells to attach to blood vessel walls in the brain, causing the most serious complications of malaria: coma and death.

Variability or var genes, as they have been named by the NIAID scientists, may lead to the identification of molecular targets for drugs or vac-

cines to prevent these potentially deadly complications. "New treatments are needed because in many areas where malaria once was controlled or eliminated it has re-emerged, largely because the parasites have become resistant to chloroquine and other standard drug treatments," comments Anthony S. Fauci, M.D., NIAID director.

Senior author on two papers, Thomas E. Wellems, M.D., chief of the Malaria Genetics Section in LPD, comments, "Scientifically, it's exciting because we've explained observations made decades ago by the previous generation of scientists and with new tools uncovered what's going on at the molecular level."

In 1965, scientists reported observing that malaria infection in mon-

keys waxes and wanes regularly, gradually fading away months to years later. With every wave of parasites, they saw a different, specific immune response.

Dr. Wellems uses the analogy of the human immune system to describe what they have learned about how such a chronic *P. falciparum* infection becomes established in humans. The human immune system can produce millions of different antibodies, he explains. When the body combats infection, specific rearrangements in immune system genes give rise to specific B cells that produce specific antibodies. "The malaria parasite mirrors the immune system's ability to make novel protein forms," he says. "Every time the human immune system generates an antibody

that can kill parasites expressing one form of the protein, some parasites have already switched to expressing a new form. It's a battle of the proteins, a thrust and parry between the host and the parasite."

This elaborate ploy allows the parasite to avoid a more certain destruction in the host's spleen. When the parasite infects a circulating red cell and matures, the parasite modifies the red cell, which the spleen can then detect and destroy.

To escape that destruction, the parasite produces large proteins that collect in knobs that are on the surface of the infected red cell. The infected cell then attaches via contact at these knobs to receptors on the endothelial cells lining tiny blood vessels. Here the parasite matures

and the red cell ruptures and releases more parasites to infect other cells, thus circumventing the spleen.

Scientists suspected that the cell's adhesiveness depends on specific surface proteins known collectively as PfEMP-1 (*P. falciparum* erythrocyte membrane protein-1). What was unknown is precisely what these proteins are and why they vary over time.

The new papers are the first to offer a molecular explanation for how red cells infected with *P. falciparum* adhere to endothelial cells and elude immune attack: the var genes produce PfEMP-1 and enable the parasite to change both the antigenic and adhesive character of the infected cells, thereby staying one step ahead of the immune system.

Decreasing Work And Leisure Time Quality Are Health Hazards

The combination of rising overwork, under- and unemployment, and decreasing opportunities for public recreation is threatening the health and well-being of North Americans, according to a group of international recreation and parks experts.

Leaders from the National Recreation and Park Association (NRPA), representing park and recreation professionals and officials in the United States, and its counterpart, the Canadian Parks/Recreation Association (CRPA), are meeting this week in Ottawa to discuss critical issues facing North American communities.

Noting recent U.S. and Canadian labor data, the group of 95 recreation leaders urged government, labor, business and communities to

partner in strategic alliances to help create a balance between work and leisure. They cited several trends that threaten individuals, families, communities and their economies:

- The dichotomy of increasingly longer work weeks for some people and low-wage, part-time jobs or unemployment for others both contribute to poor-quality work, less time for leisure and, consequently, a lesser quality of life.

- The experts cited a U.S. Bureau of Labor Standards report that overtime for manufacturing workers is the highest since 1957, when the bureau began keeping overtime statistics. A 1994 Department of Labor study of working women said that employees' major concern is the difficulty of balancing work and family

obligations.

- The number of Canadians in longer-hour jobs has been rising steadily since the 1970s, according to the Advisory Group on Working Time and the Distribution of Work, authorized by the Canadian federal minister of human resources development. Ten percent of all adult male workers and six percent of all female workers are now working more than 50 hours a week. Two-earner families, which constitute 50 percent of the Canadian labor force, are doubly impacted.

- Everyone should have the right to contribute to society by participating in meaningful work. At the same time, increasing leisure is one of the principal benefits of economic progress, a public good and a mea-

sure of national wealth," said Herb Pirk, CPRA president and commissioner of parks and recreation for the city of Toronto. "Quality recreation experiences, available through increased leisure, is a right of all people."

- The lack of quality work and leisure exacerbates other social ills. "Social problems include alarming increases in number of youths residing in family and environmental conditions that put them at high risk of health, safety and academic failure," said R. Dean Tice, NRPA executive director.

Growing pressures on parks and open spaces coupled with a growing recognition of the importance of trees, open space and urban forests are challenging parks and recreation

leaders to maintain and enhance local environments. Meanwhile, deep cuts in many public budgets reduce the capacity of agencies to provide high-quality public recreation services and park resources.

The delegates called for a national debate on the issues to influence public policies and decisions. Speakers at the week-long meeting include experts on social and economic trends, and leaders in public park and recreation management, finance and planning. Among the experts were: Arthur Donner, a Toronto-based economic consultant who chaired the Canadian report on work-time trends; Ben Hunnicutt, a professor at the University of Iowa, Iowa City, and co-director of the International Society for the Reduction of

Human Labor; and Barbara Brandt, staffperson of Shorter Work-Time Group, Boston. Other attendees were: David Welch, chief executive, Royal Parks Agency, London; Don Hunter, director, Saanich, British Columbia, Parks and Recreation, and chair of Active Living Canada; James Colley, director of Parks, Recreation and Libraries, Phoenix; David Fisher, superintendent, Minneapolis Park and Recreation; Wanda Wetterberg, general manager of personnel, Edmonton, Alberta; Marilou McPhedran, corporate director for community women's health issues, Women's College Hospital, Toronto; Ed Koenemann, director, Vermont State Parks and Recreation; and Diane Huffman, Friends of the Earth, Ottawa.

New Survey Shows Pharmacists Wary Of Measure 16 Compliance

A new survey of more than 1,000 Oregon pharmacists concludes that the persons responsible under Measure 16 for dispensing lethal doses of prescription drugs are divided evenly on the question of assisted suicide, but a majority are against the language of Oregon's controversial legislation.

The survey also suggests that pharmacists are concerned that physicians might not comply with all of the requirements of the controversial measure before writing a "Prescription for drugs to end life."

The survey was conducted by researchers from the Oregon State University College of Pharmacy and endorsed by several major groups, including the Statewide Pharmacy

Task Force on Measure 16.

According to the survey, 45 percent of Oregon pharmacists support physician-assisted suicide, while 43 percent oppose it. The rest were unsure, had no opinion, or did not answer the question.

However, when asked if they supported Measure 16 as written, only 26 percent of the pharmacists came out in favor of the legislation, while 63 percent opposed it. Nearly half - 47.8 percent - suggested they would not knowingly participate in physician-assisted suicide.

The survey was mailed to all 2,403 Oregon pharmacists; a total of 1,015 individuals, or 42 percent, responded.

Jim Slater, a pharmacy doctoral

student at OSU and one of the principle researchers in the study, said many of the pharmacists who oppose Measure 16 are concerned with its vague language and unclear "end results."

"There also is concern that the medication prescribed must be orally ingested," he added. "For the drugs currently available, it would take several handfuls of pills to ensure a lethal dose and that could result in discomfort and vomiting...and not necessarily death."

Slater said many pharmacists are concerned about potential liability. While the measure grants civil and criminal immunity to "health care providers," it does not specifically include pharmacists in that category.

Oregon Health Forum Focuses On National Reform

A leading expert on national health care reform, Carson Beadle, will share his insights on what's coming down the turnpike from Washington D.C. the breakfast forum will be held 7:30 a.m., Sept. 14 at the Red Lion in downtown Portland and is sponsored by Oregon Health Forum, an independent health policy newsletter and information resource.

This forum will help business leaders and insurance executives understand the impact of the latest health care reforms -- revisions to employee pension plans, the future of medical savings accounts as well as changes to Medicare and Medicaid.

Beadle, managing director of William Mercer, Inc., in New York, also chairs the Assn. of Private Pension and Welfare Plans.

Following his presentation, a panel will discuss the implications of those reforms on Oregon. Panelists include Colleen Cain, president of Benova; Leigh Dolin, MD, past president of the Oregon Medical Assn.; Denise Honzel, vice-president and health plan manager of Kaiser Permanente and Rand Sherwood, director of human resources, Portland General Corp.

Registration is \$25 for Oregon Health Forum subscribers; \$40 for non-subscribers. To register, contact Oregon Health Forum at (503) 226-7870 or POB 2942, Portland, 97208.

The fool is much worse than the knave, for the knave does take a rest sometime, the fool never. —Anatole France

Protein Important Early In Pregnancy

Women who restrict dietary protein early in pregnancy may limit the development of the placenta and, eventually, the fetus.

Results from a pig study at the USDA's children's Nutrition Research Center at Baylor College of Medicine in Houston indicate that such restrictions affect the size and weight of the mother-fetus connective tissue that transports nutrients and oxygen and removes wastes.

"If the placenta's size is reduced early, its ability to transport nutrients is compromised," said Dr. Wilson Pond, a USDA scientist.

According to Dr. Patricia Schoknecht, a former CNRC

postdoctoral fellow who directed the study, the placenta's size is often related to the size and birthweight of the infant.

Recommendations for pregnant women include a balanced diet with additional protein, which is available from meat, fish, legumes and dairy products.

Asthma Requires Teamwork
Keeping asthmatic children out of the hospital can be accomplished with family teamwork.

Parents should take the lead as "coaches," making the child the "star player" whose role is to keep the asthma treatment current, said Dr. Kristin Moore, and allergist at Baylor

College of Medicine in Houston.

"Start by taking as much time as needed with the doctor so that both child and parents understand why and how drugs are to be taken," Moore said.

Then recruit other team members so the child will not feel he or she is facing asthma alone. Possible teammates: siblings, parents of friends with whom the child may spend the night, teachers, school nurses.

"Having friends and supporters in many places can help ease the child's embarrassment about the condition or about having to interrupt school or play to take medication," Moore said.

Elevated Eye Pressure Sufferers May Benefit From National Study

Devers Eye Institute at Legacy Good Samaritan Hospital continues to recruit for patients who suffer from elevated eye pressure to participate in a study to determine whether using eyedrops to lower eye pressure will prevent or delay glaucoma.

Ocular Hypertension Treatment Study participants must be aged 40 to 80, and have at least mildly elevated eye pressure but no worse than 20/40 corrected vision in both eyes.

The study seeks African Americans in particular, since they are a

high risk group for both elevated eye pressure and glaucoma. Others at risk include nearsighted people, diabetics, and those with high blood pressure or a family history of glaucoma.

Volunteers receive specialized eye care for at least five years, complete eye exams every six months and standard drugs for elevated eye pressure.

Devers Eye Institute, the northwest center for the \$22 million National Institutes of Health funded study, currently leads the nation in recruitment.

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"Legal & Financial Planning"

"Legal & Financial Planning for families of the frail elderly or chronically ill" is a class taught by Tim Nay, a Portland attorney/social worker who has extensive experience working with families needing to make decisions for an impaired family member involving estate planning, assets, wills and financing necessary care.

Future class dates include: September 12, 1995, 2:00-4:30pm, October 10, 1995, 7:00-9:30pm, and November 14, 1995, 2:00-4:30pm. Pre-registrations required. Call Legacy Referral Service at 335-3500 for pre-registration information and for the locations of these classes.

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