PROFILE

Tracking a Virus and Making a Point

SARAWAK, BORNEO—An infectious agent that killed more than two dozen young children here last spring, some of them within 24 hours of becoming ill, remains a mystery. But virologist Jane Cardosa and her team at the University of Malaysia at Sarawak (Unimas) are in hot pursuit. If they identify the killer—she's characterizing an adenovirus isolated from a few of the victims, while a team at the U.S. Centers for Disease Control and Prevention (CDC) in Atlanta works on a different virus—she also hopes to strike a blow for the value of local expertise in tracking down global health threats.

By all accounts, the 45-year-old Cardosa is equal to the challenge. "She's a first-rate virologist, and she's developed a first-rate lab in Borneo," says David Warrell, a professor of tropical medicine and infectious diseases at Oxford University, where Cardosa trained. "She was one of the best students there," adds her former adviser, James Porterfield, whose work in Africa in the 1950s taught him "how essential it is to be as independent as possible under adverse conditions."

DAVID PORTNOY

Setting the pace. Jane Cardosa runs a topflight virology lab.

Independence is one of Cardosa's strong suits. Raised in Malaysia and educated in the United States—with an undergraduate biology degree from Princeton University and a year of graduate work at Columbia—she returned in the late 1970s to start a family and continue her education at the country's then-new science university (USM) in Penang. When that training proved insufficient, she decided to "get on with [her] life" and headed for England, with her 3-year-old son, to learn virology.

Her training made Cardosa a good choice in 1995 to establish a research-based Institute for Health and Community Medicine at the new university. "They wanted somebody who had started from scratch," she says about her move to Unimas from USM, where she had returned to teach after obtaining her degree from Oxford. "Lab chiefs have to be very hands-on to do science here. We don't have that middle level of workers to keep the lab running, like in the West."

Despite those limitations, Cardosa is slowly stocking up on young talent. "I came here because it was a chance to solve the pathogenesis of dengue at home, with Jane, in a better environment," says biologist Phaik Hooi Tio, who had worked with her at USM. Last fall, she was joined by chemist Donald Yapp, who completed postdocs at Washington University in St. Louis and McGill University in Montreal. "I was nervous about coming back," says Yapp. "The last time I lived here, in 1979, I was still in primary school. But the equipment here is better than what we had in Montreal."

For her research, Cardosa augments her government grants with income from a company, Venture Technologies, that she started several years ago to sell diagnostic kits for dengue and Japanese encephalitis. The company has annual sales of $150,000. "We charge people and organizations that can pay, and those who get it for free we treat as collaborators, and we ask for access to their data in return," she says.

That expertise put her in a position to help after local pediatricians reported the first cases of an illness, marked by a rash and high fever and often accompanied by damage to the heart and central nervous system, that was killing very young children. A local research team initially pointed the finger at Coxsackie virus, first identified by U.S. scientists in the 1940s. But some of the symptoms were not characteristic of Coxsackie, and the virus was never found in the victims.

A few days later, health officials and the CDC said the culprit was an enterovirus, EV-71. But Cardosa is convinced that it's not the causative agent, and Mark Pallansch, chief of CDC's enterovirus section, agrees. "EV-71 is clearly there, but lots of kids had it and didn't die. So the question is, Are there other factors?" Pallansch's lab is studying a "nonentero-, nonadeno-" virus as another possible candidate, while Cardosa has finished sequencing about half of the virus's genome.

Despite this uncertainty, Cardosa says it was an uphill battle to convince CDC officials that her lab had anything to contribute. Colleagues familiar with the incident agree that hers is a valid criticism. "The questions she was raising were legitimate, and her data were solid," says epidemiologist Joe McCormick, who spent 24 years at CDC and is now heading a new epidemiology program at the Pasteur Institute in Paris. "It was shortsighted of them not to take advantage of her capabilities. And it makes them look arrogant."

Cardosa estimates it will take several more months to sequence the virus, and Pallansch allows that the true killer may never be found. Still, she says her principles leave her no choice but to continue. "I fear that there's no concern for truth, for what really happened. … I'm a scientist, and I want to know." **–J.D.M.**

A related problem is a lack of public understanding of research—what it is and what it can do. Two years ago, an outcry from a coalition of Philippine citizens groups prompted national legislators to introduce a bill that would have outlawed all research using transgenic organisms. Media reports raised fears of mutant organisms escaping from laboratories. Department of Science and Technology Secretary William Padolina took the lead in educating Congress about both the benefits and risks of such research, and the bill was defeated. But it taught scientists not to ignore public attitudes. "Information dissemination has become an important part of our program," says Mariechel Navarro of the National Institute of Molecular Biology and Biotechnology of the University of the Philippines, Los Baños.

Correcting such misimpressions is also high on the agenda of the cluster of national academies of science that have sprung up in recent years to advise their government and promote science. But their leaders admit that they have a long way to go. "Scientists are not very visible in public dialogue, and we are partially to blame," says A. K. Zakri, deputy vice chancellor of the UKM and a founding member of the 2-year-old Academy of Sciences Malaysia. "We don't have a Carl Sagan or a David Attenborough to promote science or nature."

Mazlan tries to make a case for science with every visitor to the planetarium and with every undergraduate in her classes. "I tell students that they should enjoy what they are doing and not worry about how much money they can make," she says. "And I tell their parents that there are lots of jobs out there for scientists, and their children can make a good living."

–Jeffrey Mervis and Dennis Normile