

## Getting Serious about Flu

A combination of public health measures and technology raises hope for the flu fight

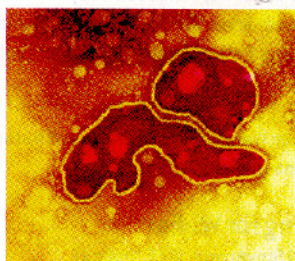
As the specter of a global flu pandemic looms ever larger, both veteran flu scientists and newcomers to the field are making important progress against the disease. **Robert G. Webster**, now at St. Jude Children's Research Hospital in Memphis, Tenn., first discovered during the 1960s that the novel flu viruses that seem to sweep through the human population every 30-odd years can arise from combinations of bird and human flu strains. He realized then that preventing new pandemics would require humans to control the avian half of the threat at its source.

After a 1997 human outbreak in Hong Kong of an avian flu virus called H5N1, Webster turned his insight into action, guiding a reform of the territory's live-animal markets to avert new opportunities for birds, animals and people to infect one another with flu viruses that might combine into a pandemic strain. The H5N1 virus has since raged throughout Asia's bird populations and infected more than 100 people, yet Hong Kong has been largely spared. That stark contrast has in the past year prompted several Asian nations as well as global agriculture and public health authorities to begin seriously discussing regional agricultural reforms that would follow the Hong Kong model.

Much of the intensified awareness of the avian flu threat to humans is also owed to the efforts of **Klaus Stöhr**, head of flu surveillance and response for the World Health Organization. Stöhr has been working tirelessly behind the scenes to break down barriers to better global preparedness for the crisis, including fostering international scientific collaborations, advising countries on how to bolster their detection of flu cases, and brokering negotiations between vaccine makers and national governments.

Both vaccines and antiviral drugs will be in short supply during a pandemic, but expanded choices are in the pipeline. **Robert B. Belshe** of Saint Louis University and his colleagues demonstrated a dose-sparing approach to flu vaccination this year, showing that administering vaccine just under the skin, instead of into muscle, prompts a greater immune response with less vaccine. This insight could also lead to an array of new techniques for administering regular flu vaccine to groups, such as the elderly, who often have a weak response to the traditional flu shot.

The **Iomai Corporation** in Gaithersburg, Md., is working on intradermal vaccination toward the goal of doing away with flu shots entirely and instead delivering the vaccine through a skin patch. Iomai has already shown that a patch containing an adjuvant—a substance that enhances immune system response—improves the effect of an intradermal vaccine when the patch is placed on or near the vaccination site. A patch that combines vaccine with an adjuvant boost would represent a radically new approach to flu immunization.



The avian flu virus H5N1 threatens to cause the next pandemic.

Innovative thinking also distinguishes **NexBio, Inc.**, in San Diego, which is gearing up for the first clinical trials of its antinfluenza drug, Fludase. Most flu antivirals work by disabling specific parts of the virus, so their effectiveness can vary considerably depending on the individual strain's defenses. Fludase instead blocks the doorway in lung cells that flu viruses use to enter them. By targeting the door rather than the intruder, the company hopes to create a drug that is equally effective on all flu viruses and offers them no way to develop resistance. This work illustrates how science, technology and policy are being marshaled to combat future flu pandemics.

—Christine Soares

## More Power to Solar

Photovoltaic advances make the ever lagging technology more of a competitor

Brazilians joke that theirs is the country of the future—and always will be. Likewise, solar power has always been the ultimate green technology of the future. But maybe the sun is finally rising. The photovoltaic market, though small, has been growing briskly:

by more than 60 percent in 2004. Plastering your roof with solar cells now runs as little as 20 cents per kilowatt-hour over the system's estimated lifetime, which is approaching what most households pay for electricity.

One especially promising technolo-

gy that emerged in the 1990s was to make solar cells from plastic spiked with nanometer-scale crystals. Even those composite devices, though, were restricted to absorbing visible light. This year a group led by **Edward H. Sargent** at the University of Toronto coaxed them to