A FASEB Sampler

The Federation of American Societies for Experimental Biology (FASEB) held its annual meeting in Washington, D.C., on 1 to 5 April. Ten thousand scientists took in more than 5500 reports and posters, a sampling of which is presented here.

Cocaine's Harmful Effects

Cocaine can kill—that much is clear. Less clear, however, is the way the drug produces its lethal effects. But several presentations at the FASEB meeting, which took "Nervous System Function and Disorders" as its theme this year, focused on cocaine's action in the body, and some of those presentations helped clarify just how the drug produces sudden death.

Take cocaine's ability to cause sudden death by triggering the chaotic heart rhythm called ventricular fibrillation. Stephen S. Hull, Jr., of the University of Oklahoma Health Sciences Center in Oklahoma City, suggests that it does this by disabling one of the body's protective responses to increased blood pressure. Normally the vagus nerve, which helps regulate the heart rate, slows the heart down when blood pressure rises. But when Hull and his colleagues infused dogs with a tiny amount of cocaine—"about a thousandth of what it takes a human to get high," he says—they found that the animals' blood pressure went up, without the customary decrease of heart rate. As a result the dogs were at high risk for sudden death should an arrhythmia come along.

"I've never seen such an ability to turn off the vagus as with cocaine," Hull remarks. Indeed, patients with acute cocaine intoxication should therefore be treated "as if they're having a heart attack—they're at that high a risk of sudden death," he says.

Less immediately devastating but of equal concern are cocaine's effects on the brain. Besides persistent headaches, it can cause seizures or even strokes—effects that are often delayed, occurring hours or days after the drug is taken. Since cocaine is broken down very rapidly, the mystery has been how it manages its delayed strikes. Neurologists suspect that some lingering agent produced by the drug must be the culprit, and new evidence supports that hypothesis.

Robert Powers of the Franciscan Shared Laboratories in Milwaukee, Wisconsin, and Jane Madden of the Veterans' Administration Hospital there have found that the compound benzoylecgonine, a major product of cocaine that can remain in the brain up to 10 days after it is injected, constricts the arteries in cat brains even more powerfully than does cocaine itself. This could disrupt blood flow to the brain, possibly resulting in seizures or strokes.

In fact, when injected into rat brains, benzoylecgonine causes seizures distinct from those induced by cocaine, according to neurologist Richard J. Konkol of the Medical College of Wisconsin in Milwaukee, who works with Madden. The seizures are delayed and tend to last longer than cocaine-induced events.

To Konkol, it seems clear that doctors may overlook cocaine as a possible cause of seizures if they are not immediately preceded by use of the drug. The new findings suggest that physicians may have to do more detective work when confronted with a patient with seizures.

Better Heart Preservation

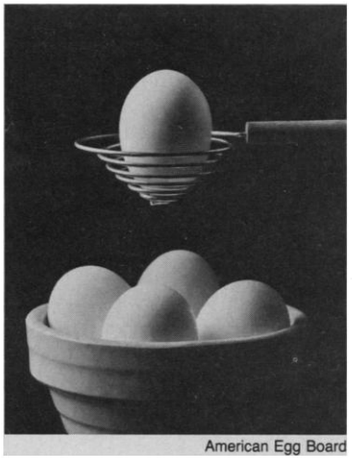
In the United States, the demand for heart transplants exceeds the supply. In 1988, for example, 1647 transplants were performed in the United States, while another 1034 people languished on the waiting list. Problems in preserving the heart for more than 4 hours have limited the availability of the transplants. They have also made it virtually impossible to ensure that the donor heart will be a good match with the recipient's tissues, thereby making rejection more likely. But if hearts could be preserved for longer periods, then organs could be rushed in from longer distances and tissues could be matched more accurately.

Help may be on the way—and from an unlikely source: the hibernating woodchuck. Xuejun Shi of the Veteran's Administration Medical Center in Lexington, Kentucky, has shown that a factor in plasma from hibernating woodchucks can greatly extend the length of time that dog hearts and other organs can be maintained after they are removed from the animals. Shi was able to preserve one dog heart for up to 60 hours, nearly double the maximum of 31 hours obtained with the controls.

The active ingredient in the plasma, called "hibernation induction trigger," works by slowing the heart's metabolism and improving the blood flow through the small blood vessels, says Shi's collaborator Sufan Chien. But before their results can be applied to human organs, the factor must be isolated, which the team is now trying to do.

While the world awaits the isolation of the woodchuck hibernation factor, David J. Dzielak of the University of Mississippi Medical Center in Jackson, Mississippi, may be able to give heart surgeons an extra day. He is adapting two commercially available preservation fluids, Euro-Collins and UW solution, now used primarily for other organs such as kidneys and livers, for heart preservation. Dzielak found that both the Euro-Collins and the UW solution could keep rabbit hearts alive for 18 hours, a great improvement over the salt solution currently used clinically for maintaining donor hearts. By combining the best properties of each, Dzielak says he hopes to make a solution that can sustain a human heart for up to 24 hours.

■ SARAH WILLIAMS



American Egg Board

A New, Improved Egg? What's good for humans with high serum cholesterol levels works well on egg-laying chickens. Robert Elkin, a researcher at Purdue University's Department of Animal Sciences, has found that when hens are fed the drug Lovastatin for 9 days, the cholesterol content of their eggs falls by up to 20%.

Does this mean that egg eaters can stop worrying about high cholesterol? Not yet. Even if the Food and Drug Administration were to approve the procedure, Lovastatin is too expensive to use in commercial egg production. But, Elkins says, the results of the experiment, which were presented on 2 April to the Federation of American Societies for Experimental Biology, will encourage researchers to try reducing egg cholesterol content with less costly compounds.

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