ALTERNATIVES TO ANIMALS NEWSLETTER

Promoting Alternative Methods in Biomedical & Behavioral Education, Testing, and Research

Volume 7 Number 1 (408) 379-1015 Jan/Feb/Mar 1993

"Reader-Friendly" Version Of The ATA Newsletter Planned

Plans are underway to publish a non-technical version of the quarterly ATA Newsletter. We will continue to publish the original version as well. We will begin the "reader-friendly" version once funding is made available! If you are interested in receiving the new version, please check the subscriber section of this newsletter!!

ATA's Book Is In Publication

At long last, ATA's book, *Non-Animal Techniques in Biomedical and Behavioral Research and Testing*, is in press! The book features the contributions of noted experts describing the application of non-animal methods in a variety of testing and research situations, including drug/design testing, cosmetic and household products testing, toxicological testing, clinical testing, chemical identification and analysis, protein sequence analysis, behavioral investigations, and disease investigations. Many of the alternatives covered have applications in behavioral as well as biomedical testing and research. The book is edited by ATA's Director, Mike Kapis, and Toxicologist, Dr. Shayne Gad. The book is scheduled for this summer, published by Lewis Publishers.

NEW TECHNIQUES FOR DRUG DESIGN & TOXICITY TESTING

(DD) Pharmaceutical Microchips

Traditional drug discovery remains a slow and remarkably hit-or-miss process of synthesizing compounds and screening thousands of them for their ability to bind with a particular biological target. Development of a new drug takes an average of 12 years and costs more than $230 million, more than double the costs of a decade ago. In addition, countless animals are killed in the process.

A promising new approach to rational drug design is on the horizon. The Affymax Research Institute in Palo Alto, California, reports that it has successfully combined chemical synthesis and photo-lithography. Affymax calls it VLSIPS (Very Large Scale Immobilized Polymer Synthesis).

The process begins with a flat chip which is coated first with a reactive chemical and then with a light-sensitive material. Through a process of masks that either transmit or block light, the surface of the chip is divided into protected and unprotected regions and then washed with a chemical solution. Only the unprotected areas react, forming a new compound. This procedure can be repeated with different masks and solutions to create up to 10,000 different compounds. The next step is to expose the compounds to a biological target, such as an antibody or enzyme.

The results can be displayed numerically or in a computer-generated two or three dimensional image that shows which compounds react and to what degree. Affymax is working on a software link to molecular modeling programs that would also allow the simultaneous viewing of three-dimensional images of individual compounds.

According to Affymax's founder, Alejandro Zaffaroni, "We can do in a month what used to take companies five years." In spite of its potential, VLSIPS has encountered skepticism from pharmaceutical companies. But Dr. Zaffaroni said, "Limitation is only in the minds of the tradition-bound companies."

(TT) Electric Culture

Two biophysicists from Rensselaer Polytechnic Institute, Ivar Giaever and Charles Keese, have developed a device in which tiny gold electrodes attached to a petri dish allow cellular biologists to monitor subtle changes in cell motility and shape.

The system is referred to as the electric cell substrate impedance sensor (ECIS). It provides quantitative data regarding cell-substrate interactions in real time and, if the voltage and current are sufficiently low, does not affect the cells. The ECIS system offers promise in investigating whether cancerous cells, carcinogens, will metastasize or spread, and as a reliable means for testing how mammalian cells react to drugs, toxic chemicals, and other foreign agents.

Giaever, a Noble Prize winner in 1973, states, "This won't stop all animal testing, but we hope it will make it possible to do a lot less testing with live animals." In spite of Giaever's and Keese's impressive expertises, the two failed last year to get basic research grants from the National Institute of Health (NIH) and the National Science Foundation (NSF). Techniques, such as ECIS, will eventually and undoubtedly bring "culture" to traditionalists at the NIH and the NSF!

New Device For Investigating Brain Tumors And Epilepsy

A research team led by Toshimitsu Musha of the Science University of Tokyo and Saburo Honda of Chiba University in Japan have developed a new electroencephalograph which will improve the diagnosis of brain tumors and epilepsy at an early stage.

Conventional encephalographs detect ab-normal brain waves but cannot reveal where they are coming from. The new electroencephalograph feeds information gathered from 32 electrodes into a computer, which analyses data and pinpoints the source of any abnormality in a three-dimensional image of the skull.

CT: Early Test For Alzheimer's?

At present, there is no definitive diagnostic test for Alzheimer's disease, a progressive dementia with no cure.

A new test, based on the observation that, in Alzheimer's patients, certain structures within the brain shrink. David Smith and colleagues at Radcliffe Infirmary in Oxford, and Nicholas Wald St. Bartholomew's Hospital in London, have focused on the medial temporal lobe, an area involved in memory.

X-ray images of the brain are generated by CT (computerized tomography) scanners. Patients are normally scanned horizontally, but the researchers adopted a different angle, 20-degrees from the horizontal, so they were able to view the temporal lobe as a "horseshoe" of tissue around the brain stem.

The researchers identified 92 percent of the patients, but at a cost; namely, falsely identifying 5 percent of controls. To overcome this the researchers suggest combining the CT scan with another "marker" for the disease to reduce the number of false positives.