

Coalition For Animals & Animal Research

CFAAR Arizona Newsletter

P.O. Box 210101, Tucson, AZ 85721-0101 (520)621-3931 Volume 13, Number 4

Editor: Grace Aranda (antrnweb@ahsc.arizona.edu)

To join the Arizona CFAAR, please fill out the membership form on the back page. Donations publish our newsletter and educational materials. A year's subscription is included with your contribution.

CFAAR: Who We Are

CFAAR is a nonprofit educational organization which formed in response to activists who were attempting to discredit animal research and animal researchers in 1988. Several local CFAAR chapters have since sprung up across the country. These groups share the following objectives:

- 1) To **organize** students, faculty, and staff at institutions where animal research is performed so effective letter writing campaigns can be initiated quickly.
- 2) To **educate** the public, in general, and the campus, in particular, about the true nature of animal research and animal researchers.
- 3) To **support** responsible and humane use of animals in biomedical research.

The first of these objectives will be the primary function of the group. As legislation is introduced that affects animal research, we need to respond so our representatives know exactly how we, the people, want them to vote. Accordingly, through our newsletter, we will help inform you about legislation and other "happenings" concerning attacks on animal research. Our goal is to make it as easy as possible to contact your Washington, D.C. representatives.

The key to the effectiveness of this organization is you! We need your willingness to write an occasional letter, perhaps talk with a school group and, of course, give a few dollars to cover the cost of printing the newsletter and educational materials.

**HELP SUPPORT CFAAR
SO WE CAN SUPPORT YOU**

Animal Keepers Are Vital to Lab Research

By Colleen Krantz

Vickie Knepper reaches into the shoebox-size, clear plastic container and picks up a recently weaned mouse. With practiced efficiency, she holds the rodent by the scruff of its neck, punches a tiny hole in its ear as an identifier, and snips off the tip of its tail for later genetic analysis. She repeats the procedure over and over, mouse after mouse, inside a locked portion of a building at the University of Iowa's Oakdale campus in Coralville. "If I'd known how much I enjoy animal care, I would have been here right after graduating from high school," said Knepper, 44.

The Harper woman is one of 35 animal caretakers at the U of I, those whose behind-the-scenes work is vital to experiments involving animals but whose names won't show up when findings are published in medical journals. The job of animal caretaker has evolved over the past few decades. It now requires much more than just "changing dirty cages and feeding and watering animals," said Dr. Paul Cooper, a veterinarian and director of the U of I's Office of Animal Resources.

The full-time caretakers must be experts in maintaining sterile conditions. They keep track of breeding schedules and hormone injections. They carefully label tissue or blood samples. They watch for malfunctions of the equipment that circulates fresh air through the cages and provides a constant supply of clean water. "It's very important that we get everything right . . . because the researchers get their findings from this," Jim Hynes, a caretaker supervisor, said as he watched Knepper move on to another mouse cage. He said the hole punch in the mouse's ear hurts the rodent as much as it would a person who was getting an ear pierced.

More than 34,000 animals are housed at the university, of which more than 32,000 are mice. The rest include everything from cats to hamsters to monkeys. Most are used for medical

research. Iowa State University has 21,000 animals on or near campus used in research or teaching. It has the equivalent of 23 full-time workers caring for those animals, officials said. The University of Northern Iowa has a minimal number of animals, most in its biology department.

The animals at the U of I live in a variety of medical buildings on central campus and in the highly secured building on the Oakdale campus. Every day just before 6:30 a.m., the caretakers file into their assigned buildings to begin the tasks that go into providing a stable environment for the animals. In the nondescript white building on the Oakdale campus, they don gloves, masks, booties and aprons before entering the rooms filled with hundreds of cages.

As Hynes opens a door to one such room, he points out that the space is designed to have positive pressure - the air flows outward so viruses don't flow in. Each individual cage also has positive-pressure air flow and a filter that can block viruses. The university has spent about \$5 million over the past 15 years or so on these special containment cages, Cooper said. They require fewer cleanings because they have a steady supply of fresh air. Some savings resulted from the lower labor requirements.

The rooms full of cages are monitored by a computerized alarm system that will automatically call a supervisor - night or day - if the air-circulation system malfunctions or a single water dispenser begins to leak. The U of I spent about \$350,000 to install the systems throughout campus. "Research animals have second priority only to hospital patients," Hynes said. Cooper added: "If (U of I President David) Skorton's air-conditioning quits working and ours quits working, and we only have one guy to work on them, we get to supersede."

The mice also drink better water than students or professors who sip from campus water fountains. Why such high priority? A disaster in one building - whether the spread of a disease in the mouse population or a flooded lab - could set dozens of research projects back years. That could mean a loss in money or a delay in reaching conclusions that might help in the treatment or prevention of some disease. The research might focus on anything from multiple sclerosis to high blood pressure.

The Oakdale building alone houses about 9,000 mice. Many of those have had altered

genes introduced or genes removed so they express some ailment or disease that afflicts humans. Offspring of the mice that carry the altered genes are often used in the research as well. The average genetically altered mouse might be worth as much as \$1,500, Cooper said. With that kind of money on the line, the university is careful in selecting its animal caretakers. "We can't just hire someone off the street for a few hours a day," Cooper said. "These are full-time workers who are required to go through training."

Mikhiela Sherrod, a U of I graduate student in genetics who uses mice to study high blood pressure, said the caretakers must follow the rule: First, do no harm. "The basic thing for them is to be clean and make sure the mice are fed. They keep them contained and keep them in a stable and consistent environment," said Sherrod, 29. "That's pretty much the key so that when you manipulate things, you can say the changes you see are the result of changes you've introduced" and not because of other environmental factors.

Knepper, whose salary is about \$24,000, often gives a vague answer when people ask her what she does, because she'd rather not debate animal-rights activists. "You never know," she said. "I don't want to offend them or get into an argument." Cooper, however, said he is open to discussing his job and explaining how regulations dictate what can and can't be done with lab animals. He'll gladly describe how a committee reviews proposed experiments to determine if the possible gain is worthwhile. "It's important to talk about where research has gone," he said. "I don't think a lot of people understand that it's a very highly regulated enterprise."

(Des Moines Register, 8/17/03)

Explosions Rock Bay Area Biotech Company

Two early morning explosions Thursday on the campus of Emeryville's Chiron Corporation may have been the work of animal rights activists, a company spokesman said. Martin Forrest, a company spokesman, said no one had been injured in the two blasts -- the first around 3 a.m. and another an hour later. A third blast around 7 a.m. was the work of authorities who detonated a third explosive device found in a five-gallon

container with an egg-timer trigger and hidden in the bushes.

Company officials say damage was 'minimal' to the facility which is a worldwide leader in bio-tech research in developing new treatments for cancer and other deadly illnesses. However, Forrest did say the plant does do animal testing and has received threats through the mail. "We believe this is the activity of animal rights activists and was meant to harass and affect the good work we are doing here," he said. "We're not certain of anything right now...Where the bombs were located, it looks like they were external to the company."

A supervisor at the Emeryville company told KTVU that an email had gone out to all 2,000 employees on Wednesday, asking them to be on alert for anything out of the ordinary after an incident at the company's Seattle plant. FBI and ATF investigators had joined the investigation and -- although no one has yet to claim responsibility for the bombs -- authorities told KTVU that some animal rights groups were being viewed as potential suspects. Meanwhile, Forrest asked employees to wait until the afternoon to come to work. "We are asking our employees not to come to work until 1 p.m. today," Forrest said. "We want to make sure these two explosions were the end of this activity." Violent animal rights activity has picked up in the state in the last few months. Last week, an arson fire at a Los Angeles dealership destroyed or damaged dozens of Hummers and other SUVs.

The ELF - a leading animal rights group - has claimed responsibility for a slew of arson attacks against commercial entities that members say threaten or damage the environment. It is suspected in a \$50 million arson Aug. 1 fire that destroyed a five-story housing complex under construction in San Diego's fast-growing northern edge. The group has also taken responsibility for vandalizing sport utility vehicles at dealerships in Santa Cruz and Erie, Pa.

(The KCRA Channel, 8/28/03)

Eco-Activists Taking on Company Workers By Don Thompson

At 3 a.m. one recent morning, animal rights activists enraged by a company that tests

products on animals gathered outside the home of an executive. They bellowed through bullhorns, made sirens pierce through the night and papered the Los Angeles neighborhood in leaflets denouncing Huntingdon Life Sciences officials as, among other things, "puppy killers." "We'll be back," the group, Stop Huntingdon Animal Cruelty, later warned the executive on its Web site. "We know where you live, we know where you work, and we'll make your life hell until you pull out of HLS." What made the noisy protest unusual was that its target wasn't an executive with Huntingdon Life Sciences: It was a manager of a Los Angeles company that just sells software to Huntingdon.

Companies that have been targeted in the past and even some fellow activists are watching the tactic warily. On Sunday, Stop Huntingdon Animal Cruelty announced it would begin a week of similar demonstrations nationwide outside homes of people with often tenuous ties to animal research. The group says such tactics have "broken new ground in the struggle for animal liberation."

Similar tactics are quickly being adopted by other environmental groups. "It becomes a prototype for attacking any kind of business that does anything any group doesn't like," said Frankie Trull, president of the Foundation for Biomedical Research. "It's likely that we are just witnessing the beginning of a very serious problem." Richard Michaelson, Huntingdon's chief financial officer, agrees: "This is a new tactic of political extremism that we're not used to in this country. It's simply never been done before."

There have been no known physical assaults on individuals in the United States, but Michaelson and others fear increasingly violent rhetoric means it's only a matter of time. "Terrorism isn't so much what you do to someone - it's what you make people think," said Michaelson, himself the target of a protest outside his New Jersey home over the Memorial Day holiday.

The tactics are being eyed by opponents of globalization, supporters of fair wages - any social justice movement that sees corporations as an enemy, said SHAC organizer Kevin Jonas. SHAC and other activists say they oppose violence against any animal, including humans. "We're not a criminal enterprise, we're not terrorists - we're people who care about animals," said Jonas.

Jonas said SHAC is exercising its free speech rights. But he wouldn't condemn others who turn to property damage or violence: "I think there's a time and a place for every action." SHAC's tactics were pioneered by British activists who recognized that behind every faceless corporation, "there are people who have homes and liability and privacy issues," Jonas said.

The activists haven't been stopped by court orders in California, Illinois, New Jersey and New York, a federal grand jury investigation, and the arrests of a dozen SHAC activists in Boston last fall. An Internet technique borrowed from abortion opponents gives the campaigns unprecedented reach while permitting a degree of legal separation from illegal activities that might result. SHAC's Web site, for instance, posts targets' home addresses and urges protesters to try to embarrass them. "We're seeing sort of a copycat effect within the ecoterror movement," said Kelly Stoner, executive director of the Oregon-based watchdog group Stop Eco-Violence.

Earth First! activists occupied a Portland, Ore., bank in July and urged a boycott because two of its board members are timber executives. And last fall, another group discussed targeting a timber company's insurance carriers, and finding out where company officials live, attend church and send their children to school, she said. "One has to wonder where it's going to stop, because SHAC's success is definitely not going unnoticed," Stoner said.

(ContaCosta Times, 5/27/03)

Blue Cross/Blue Shield & Animal Research

As you may know, the animal activist groups PCRM ("Physicians Committee for Responsible Medicine") and PETA ("People for the Ethical Treatment of Animals") have been publicizing the erroneous claim that America's Blue Cross/Blue Shield Association (BCBSA) is restricting its donations to the March of Dimes for non-animal research methods only. Because this claim implies that one of the largest health care groups in America does not support the humane and responsible use of animals in medical research, it created widespread dismay and distress in the biomedical research community.

NABR has undertaken a thorough review of the situation and it would appear that the claim is without any basis in fact.

In an effort to help clarify the situation, the Blue Cross Blue Shield Association released this comment today: BCBSA endorses and supports medical research that will advance medical knowledge, decrease human suffering and lead to more clinically and cost-effective care. Such support is contingent upon the ethical treatment of human and animal subjects. Adequate guidelines and rules exist for the protection of all such investigational participants. Major research organizations in conformance with such principles are the infrastructure from which medical progress will come, and because of their efforts, we may all look forward to a better future.

NABR extends its thanks to all of those in the research community who took the time to contact the BCBSA about this important issue. And we thank the BCBSA for clarifying its position and helping to dispel yet another myth of the animal activist community.

(NABR, 7/15/03)

Fast-Acting Vaccine Blocks Ebola Virus

By Adam Marcus

A fast-acting version of the Ebola vaccine builds protection against the deadly virus in one month instead of the usual six and could make containment of the pathogen more realistic, a new study says. The new vaccine is still experimental and it hasn't yet been tested in people. But it could help public health workers control outbreaks of the disease more quickly and effectively. "We're probably going to go back and see just how much we can press the envelope. You'd want to immunize [health workers] today and put them on a plane tomorrow," says study co-author Peter Jahrling, an Ebola expert at the U.S. Army Medical Research Institute of Infectious Diseases.

A fast-working vaccine not only would benefit health workers, but it could let them corral an outbreak using so-called "ring" vaccination -- the process of inoculating contacts of infected people. A report on the findings appears in the Aug. 7 issue of *Nature*. Ebola was first identified in 1976 and has plagued Africa since. The disease is caused by two of four fluid-borne viruses that produce a fatal, bleeding fever. They kill roughly 80 percent of the people they infect,

usually within a week. Its status as one of the world's deadliest and most gruesome viruses makes Ebola an obvious choice for bioterrorists.

Scientists have had success creating a vaccine that stimulates the immune system against Ebola. But the battery of shots -- which uses DNA from the virus along with boosters -- takes more than six months to administer fully, too long to be much help against a blitzing outbreak. In the new study, researchers at the National Institutes of Health and the U.S. Army's Medical Research Institute of Infectious Diseases tried to streamline the Ebola vaccine. They eliminated the first step, relying instead simply on a version of the booster -- a mix of crippled adenoviruses (a form of cold virus) carrying three genes for harmless proteins from the deadly microbe's Zaire strain. "What is very attractive about the adenovirus is that it seems to be very well adapted towards eliciting strong immune responses," says Dr. Gary Nabel, director of the National Institutes of Health's Vaccine Research Center in Bethesda, Md., and leader of the research project.

Macaques that received the vaccine quickly began producing blood proteins specific to Ebola, an important step in building immunity to the virus. The reaction was weaker than with the DNA-based vaccine, but it was faster. What's more, the single injection was strong enough to protect every animal from infection with the virus 28 days later, the researchers say.

That's about the standard for vaccines against diseases such as measles and mumps, though the smallpox vaccine is believed to provide protection in as little as four days, Jahrling says. "We're not going to get that for sure, but it's not unprecedented to get it down to a week." "We have not tested the lower limits of protection in terms of the time interval between the first shot and the ultimate challenge" with Ebola, Nabel says. "It looks to be a very effective vaccine. A single shot protects the monkeys completely," says Dennis Burton, an immunologist at the Scripps Research Institute in La Jolla, Calif. "It's very impressive." Burton calls the chances the shot will work in humans "very high."

Last year the Dutch firm Crucell NV announced it was partnering with the National Institutes of Health to develop an Ebola vaccine. The vaccine will use Ebola genes sewn into a crippled cold virus. Nabel's group also is working

with the California firm Vical to bring their DNA-based vaccine to market.

Since Ebola is so lethal, whatever vaccines against the microbe win regulatory approval will do so thanks to effectiveness tests on lab animals, and monkeys in particular, rather than people. But the sacrifice doesn't have to be in vain.

Ebola's Zaire strain is now decimating the great ape populations in Africa, especially in Gabon and the Republic of Congo. A recent study in *Nature* claims the virus now rivals hunting and logging in the demise of gorillas and chimps, whose numbers fell by more than half in Gabon between 1983 and 2000. "Maybe this is a way to save those great apes," says Jahrling. "There are no known adverse events" associated with the inoculation, he says, and there's no reason to believe it would harm the animals.

However, conducting a rigorously controlled clinical study of the vaccine in wild apes would be impossible, Jahrling says. "It's not trivial to go up to an ape and find out if he has Ebola," Nabel adds. So scientists may have to be especially creative to bring the vaccine to the creatures.

(Healthday, 8/6/03)

Students Revel in Lab Research

By Kelly Rohrs

Jessica Ward has spent the last two years teaching monkeys to count. Working in an on-campus psychology lab, the junior takes the monkeys out of their cages, sits them in chairs and locks them in a soundproof booth. Then she encourages them to first touch one square and then two. "It takes lots of treats and lots of patience," she said.

Ward, a pre-veterinary student, is one of many Duke students who gave up a summer in Rome or a job waiting tables to work in a science laboratory. Some go into the job with dreams of finishing an entire project and are usually disappointed, but many enter with lower expectations and come out of the experience with a whole new perspective and set of skills. "I thought I'd be mixing things and repeating something that's already been done," said sophomore Matt Fischer. Instead, Fischer arrived at his lab to discover he would be performing miniature surgeries, extracting bronchial tubes

from mice and threading wires through them. "It's really cool that you get to have a piece of something that no one else was looking at," Fischer said. Like many other students working in labs, Fischer was working on cutting-edge research this summer.

Junior Emily Heikamp spent the first half of her summer working at a renowned bio-genetics lab in Cambridge, England. "When I got there, the first thing they told me was, 'You can't tell anyone this. It's totally top secret,'" Heikamp said. "It was sort of intimidating." Heikamp added that she struggled to find textbooks explaining the background for her summer work until her mentor at the lab told her it was not in textbooks yet. "You can't always take scientific textbooks as fact," he told me. It totally took my world down," Heikamp said.

Many students said a vast majority of early lab work is just learning the vocabulary. Fischer said he spent the first few weeks of work reading every journal article written about mice's bronchial tubes—a task much larger than he expected. Heikamp, who now uses cell names of seemingly random letter and number combinations casually, said she was more impressed with the British vocabulary and culture she acquired from her colleagues. "In the beginning I was searching on Google.com for 'apartments for rent,' and in the U.K. they call them 'flats for let,'" she said with a laugh.

Students said the easiest part about the work is finding it. Dozens of grants exist on Duke's campus, and labs are always looking for help. Of course, working in a lab is not without its trials. Ward said one of the other keepers once locked her in a cage accidentally. "I had to do a MacGyver-like move to get out of there," she said. She added that dealing with monkeys can sometimes make problems outside the lab seem trivial. "Nothing that a roommate can do is worse than having a monkey throw poop at you.

(The Chronicle, 8/28/03)

Congratulations to the Winners of the 2003 SwAEBR Essay Contest!

**How Biomedical Research
Using Animals Has Benefited Me**
By Mia, Canyon Del Oro High School

Virtually every major medical advance of the last 100 years has depended on research with animals. Without animal research, doctors would have no chemotherapy to save the 70% of children who now survive acute lymphocytic leukemia. Sixty million Americans would risk death from heart attack, stroke or kidney failure due to high blood pressure without medication to control it properly. Thousands would be killed or crippled by polio because no vaccination would exist. Animals save and improve lives by providing the scientific knowledge to treat diseases and disorders like these and to ease pain and suffering.

Animal research has benefited me significantly. I was always much shorter than my friends, but as I became older, the difference in height became even greater. My family and I thought that it was just my genes; my relatives are not above average in height. However, on a routine doctor's visit when I was 13 years old, my pediatrician noticed from my medical history that my growth rate had slowed down tremendously during the past three years. A normal child will grow about four centimeters per year, but in the last year I had grown less than one. I was put through a series of tests, which included multiple blood tests, a growth hormone stimulation test, an MRI, and bone age x-rays. After all testing was completed, it was determined that I have Growth Hormone Deficiency.

Growth hormone is vital to growth and development and is the principal hormone governing height in an individual. Growth Hormone Deficiency is a disease often caused by a problem in a pituitary gland or the hypothalamus in the brain. The disease is estimated to affect 1 in every 4,000 school aged children. Growth Hormone Deficiency can result either when growth hormone is not present in the pituitary gland in adequate amounts or when growth hormone is present in adequate amounts but is not released properly.

Ironically, my diagnosis was good news because we could finally begin treatment, and I was prescribed growth hormones. I now use Humatrope, a synthetic form of human growth hormone, biosynthesized through a process known as recombinant DNA technology. It is a protein which must be injected to be properly absorbed and remain active. Humatrope is chemically identical in structure to growth hormone produced by the pituitary gland.

For these growth hormones to be created, biomedical research was necessary to gain the essential knowledge about them. To acquire this knowledge, the nonhuman primate was used because of its close resemblance of the human being due to evolutionary similarities. We share a delayed development, prolonged pre- and postnatal growth periods, and an adolescent growth spurt. Valuable knowledge of growth hormone secretion was gained in the research of the nonhuman primate such as the chimpanzee, baboon, rhesus monkey, and squirrel monkey. With this research, scientists are able to treat Growth Hormone Deficient patients to maximize their height.

After the synthetic growth hormones were developed, they had to be tested, just as any drug must be. Laboratory animal testing is an essential way to obtain knowledge about potentially harmful effects of products because it provides the most reliable source of information for scientists. Testing in cell cultures or in nonliving systems cannot replace animal testing because animals are so complex. When a substance is introduced into an animal, it can interact in many places throughout the whole body and cause unexpected negative effects. Therefore, the recombinant human growth hormone was tested on animals to ensure its safety. Now I can benefit from the hormones without risk.

Without using animals in science and biomedical research, the world would be a very different place today. In addition to growth hormones, so many more areas of medicine have benefited from animal research. With the help of animals, vaccines for small pox, rabies, and polio were developed. Our understanding of blood was advanced, making transfusions possible. Coronary bypass surgery was developed, using techniques perfected on animals. Cardiac pacemakers and organ transplantation advances were also developed. Animal research has been a part of over 41 Nobel Prizes awarded, and it continues to be critical to progress in many areas of medicine and health.

Although growth hormones may seem unimportant compared to vaccines and open heart surgery, they have made a huge difference in my life. My mere centimeter a year has increased to six and my expected height is 5'1", maybe more. That may seem rather short to some, but it's divine to me. I can proudly say, "I'm still growing," thanks to biomedical research using animals.

Follow-up essay -

When you're just sixteen, it's nearly impossible to find a decent summer job, especially without past work experience. But I was so fortunate to win the SwAEBR essay contest and was given an internship at a biomedical research lab at the University of Arizona. There, I didn't just watch, I actually did; I really helped out while working with Dr. Selmin, Trish, and Francoise. Not only did I organize their lab areas and all of the chemicals, but I also set up reactions and ran PCRs and Westerns, while at the same time learning about DNA, RNA, and bacteria.

Since I had never taken a biology course in school, the things they did were naturally confusing at first, and it seemed like I was just "smiling and nodding" when Trish and Francoise were explaining things to me. Nevertheless, they tried to use words I would understand, and I quickly started to recognize the terminology they used and research they did. As I became more familiar with the lab and their work, I understood more, and it made sense. Now I will even be ahead when I enter my biology class next year! But more than that, I can further appreciate the work that goes on for biomedical research.

This summer was more than just an impressive job to put on my future applications; it truly was an unforgettable, helpful, and life-changing experience. I was able to utilize many skills that I have learned in my classes and actually see them in everyday use. I am grateful to Dr. Selmin, Trish, and Francoise for spending so much of their time with me and never hesitating to answer a question. I had an incredible learning experience and I know it will be very beneficial in the future.

The Healing Strength of the Yew Tree

By Arielle, Chaparral High School

My grandmother was always an active, youthful woman with a wonderful sense of humor and a positive outlook on life. Even after her seventieth birthday, I never perceived her as old or frail. Five years ago, though, she began the battle with cancer that would change her life forever.

In the fall of 1997, my grandmother began experiencing unusual abdominal pains and swelling. She also had a disturbing rash on the skin of her breast. After a long series of biopsies and a major exploratory operation on her abdomen, my grandmother was diagnosed with

an unusual form of ovarian cancer that had already metastasized.

Shortly thereafter my aunt, who is my grandmother's daughter, discovered a lump in her breast after a routine mammogram. She underwent a mastectomy and was diagnosed with intraductal carcinoma of the breast. Despite the mastectomy, her cancer had already spread to several lymph nodes. For several months, my grandmother and aunt experienced the trials of chemotherapy at the same time.

By the age of forty-five, one in ninety-three women will experience breast cancer. My aunt's cancer was classified as Stage 3A, meaning that malignant cells had spread to nearby lymph nodes and could be as large as 5 cm. Both she and my grandmother faced a long period of grueling chemotherapy and radiation treatments before they could hope to return to their normal lives.

As part of their early chemotherapy program, both women began receiving paclitaxel, commonly known as TAXOL, in combination with other drugs. At that time, TAXOL had just been approved for the treatment of ovarian and breast cancer. By the time my grandmother and aunt received the drug, it had undergone extensive scientific scrutiny.

In 1958, the National Cancer Institute began screening plant species for anti-cancer activity. Thirteen years later, Drs. Monroe Wall and M.C. Wani of Research Triangle Institute, North Carolina, identified an anti-cancer compound in the bark of the Pacific yew tree. This compound eventually became the active ingredient of paclitaxel. Subsequent animal studies showed that paclitaxel increased the longevity of mice with experimental cancers. In 1979, Susan Horwitz, Ph.D. discovered that the plant extract inhibits erratic cell division in tumors binding to microtubules in the cytoskeletons of cells. Eventually, researchers learned to synthesize paclitaxel from renewable resources, and the FDA approved the drug for ovarian cancer treatment in 1995. Today, oncologists use TAXOL to treat ovarian, breast, and lung cancers.

Most modern drugs are made synthetically to perform a predetermined function, tested on animals to confirm efficacy and safety, and then tested on human patients. The development of TAXOL was unusual because researchers began with a naturally occurring substance, pinpointed its effectiveness as an anti-cancer agent through

animal testing, and then studied its mechanism of action. The research animal is a crucial component of this process. Without the mouse experiments, TAXOL researchers may not have linked this isolated plant compound to its life-saving anti-cancer properties. Also, even if TAXOL's mechanism of action became apparent through non-living models, animals were needed to prove that the drug was effective and safe before human trials began.

According to the 19th - century physiologist Claude Bernard, coined "the father of experimental medicine," physiology must be a lab science, with findings supported by experimental as well as clinical data. "In a word, I consider hospitals only as the entrance to scientific medicine; they are the first field of observation which a physician enters; but the true sanctuary of medical science is a laboratory." Animals serve as specimens for laboratory experiments, and they provide empirical data which leads to the creation of new treatments. The American Medical Association asserts that "virtually every advance in medical science in the 20th Century, from antibiotics and vaccines to antidepressant drugs and organ transplants, has been achieved either directly or indirectly through the use of animals in laboratory experiments." The flexibility that animals brought to biomedical research allowed TAXOL to be born and, eventually, to reach my family.

Unfortunately, metastatic cancer is rarely curable. Both my grandmother and aunt went into remission after being treated with TAXOL, a variety of other drugs, and radiation. My grandmother developed a malignant brain tumor in October of 2000, and her health fluctuated for two years before she died peacefully at a Hospice care unit. My aunt remained in remission for more than four years, but she now receives chemotherapy treatments due to elevated tumor markers in her blood. Despite these setbacks, I am grateful to the researchers and producers of TAXOL for providing my beloved family members with a temporary period of health and activity. Furthermore, I feel optimistic that animal research will lead to better treatments and prevention strategies so that future generations can be spared from this deadly disease.

Follow up essay -

This summer, I spent six weeks working at Barrow Neurological Institute (BNI) in the lab of

Dr. Treiman. This lab is currently performing an experiment to determine the role of genes in child abuse. We designed a rat model of child abuse and used microarray technology to compare gene expression in normal and "abused" rats. Our goal is to discover whether genes are expressed differently under stressful conditions and if heredity influences an animal's response to stress.

When I came to the lab in July, the researchers had already harvested brain tissue from rats in both the control and experimental groups. My partners extracted RNA from the tissue and placed it on Klontech arrays to reveal the strength of gene expression in each sample. I then analyzed the arrays on the computer. I placed genes in groups based upon their function in the cell and pointed out patterns of up-regulation and down-regulation between the samples. This information, eventually, will allow us to draw conclusions about the experiment. I also designed primer sequences for RT/PCR reactions to amplify particular genes of interest. Finally, I organized a patient database to help Dr. Treiman find candidates for a separate study that she was designing on pseudoseizures.

Overall, I am very grateful for this experience. Being totally blind, I was not sure if I could work with animals or chemicals, but the computer offered me a chance to be equal. Using only a simple text-to-speech program, I was able to navigate the vast wealth of genetic resources and do work with data that contributed directly to the experiment. There were several summer students at BNI, and we all attended lectures concerning various aspects of neurological science. Both the lectures and the hands-on labwork taught me a great deal, and I hope to utilize these lessons later in a biomedical career. I would recommend the BNI to any SWAEBR contest winner or any other student interested in the scientific process.

Animals Save Human Lives

By Melissa, Desert Vista High School

Life has become so fast paced, with people continually focused on school, family, friends, jobs, money, and other everyday problems. As Americans in a technologically advanced society, we take our lives and health for granted. Thanks to drastic improvements in medical treatments and information, we no longer

have the need to fear influenza or bronchitis, among the top ten leading causes of death in 1900. Pharmacies are now open 24 hours, selling every type of antibiotic and over-the-counter medicine, which can be found in every household. Ailments that threatened death 100 years ago are no more than minor setbacks today. However, a new set of challenges have arisen. Everything changes the morning you wake up to a house full of paramedics and a father with chest pain.

My father appeared to be one of the healthiest people I knew. A type A personality, everything was in order; he maintained a steady job as an airline pilot, kept up our house, spent time with my family, took care of himself, ate well, and even managed to go to the gym on a regular basis. There were no warning signs of the problems to come. On August 24, 2002, my 46-year-old father was diagnosed with atherosclerosis.

Atherosclerosis is "characterized by the deposition of atheromatous plaques containing cholesterol and lipids on the innermost layer of the walls of large and medium-sized arteries." For my father, this meant that the levels of triglycerides - a form of fat - in his body were much too high and had partially blocked one of his arteries, causing a reduced blood flow, and eventually heart attack. In order to help my father, the doctors told us, it would be necessary to perform both angioplasty and insert a stent into his artery.

The first human balloon angioplasty was performed in 1977, which eventually led to the creation of coronary stents 10 years later. Both procedures are a type of non-surgical cardiac catheterization. The process involves the insertion of a catheter into the groin area and through vessels directly into the heart. Angioplasty "is the most common way to open arteries without the trauma of bypass surgery". In order to remove excess blockage and open the artery, a tiny balloon is inflated. Stents take angioplasty a step farther, inserting a stainless steel wire tube in order to prevent the artery from closing in the future.

The amazing technology that is available today would not be possible without the use of animal research. Both angioplasty and the use of cardiac stents have been refined over many years and improved in order to provide us with the current technology. Throughout many years, animals - especially dogs - have assisted in the

development of both procedures and provided a wealth of necessary information to scientists.

Doctors and scientists, using animal models and other techniques, are continuously learning new information about atherosclerosis and other heart diseases. A current study at the Mayo Clinic indicates: "that treatment with stents coated with Abbott's proprietary drug resulted in dramatic improvement in vessel patency, or openness, versus stents alone in a well-accepted coronary injury model in pigs". Because scientists have the opportunity to work with pigs in their research, they are able to unlock more secrets of the disease and, hopefully advance the technology and treatments. Before long, stents and angioplasty will become procedures of the past, making way for more sophisticated forms of treatment and prevention.

Atherosclerosis, a disease now among the top ten leading causes of death, many times is genetic and cannot be traced to specific problems in the person's lifestyle. However, because my father's heart attack alerted doctors early, they were able to help him and restore his previous lifestyle. The cardiac stent remains in his heart, and will hopefully help him to function for many more years. My father is now living his life almost exactly as before his heart attack, with new medicines and minor adjustments in diet. Because animal research has given doctors much information about the disease and treatments, my father was given his life back.

Follow up essay -

The last decades have brought on a rapid evolution of technology that has left many Americans feeling omnipotent - as if they know everything. However, the reality is that every new piece of information brings forth questions and paths in unforeseen directions. Science has introduced to us the study of organic chemistry through models of nucleic acid. We now know how DNA and RNA are encoded and the process of protein synthesis. The human genome project has even identified the coding and function for many of the thousands of genes that operate our bodies. But, how much do we really know? DNA and RNA - the coding which impacts our lives so greatly on a daily basis - remains a mystery in the world of science. These mere molecules, microscopic in size, are capable of performing feats that the human mind could never imagine. As with all aspects of life, these powers can

produce both positive and negative effects. The complete understanding of these processes and the influences on nucleic acid could bring our technologically advanced society to another level, one in which the ultimate control is in our hands.

What impacts gene expression? How much influence do outside factors have in altering the genetic makeup within our bodies? These were the questions I was asked to study as I began my internship at Barrow Neurological Institute (BNI). The project I was assigned to work on dealt with studying gene expression in rats to determine the long-term neurological effects of stressors during early stages of development. The use of rat models to exhibit phenomena such as child abuse enables scientists in the Behavioral Genetics laboratory to gain more understanding in these areas and hopefully open new paths toward solutions.

Genetics and its role in our lives have always astounded me; my experience this summer has only reinforced this idea and shown me the entire scope of possibilities linked to the understanding of genetics. Working with new technology such as microarrays - a less arduous means of examining and comparing gene expression levels - has reinforced the complexity of our subatomic processes and shown me the importance of genetic research and its potential impact of technology.

My experience at the BNI will always be one of my most memorable and life-changing experiences. Initially unsure of where my future paths would lead, I am now certain that I will study biomedical engineering and hope to one-day work in a lab similar to the BNI. I am very grateful for this opportunity. I would like to thank all of the people at the lab who were more than willing to help me and made my experience valuable.

The Southwest Association for Education in Biomedical Research - SwAEBR

The progress of biomedical research is threatened by the growing scientific illiteracy of the public and, in particular, our young people. Opinion polls have shown that most adults do not understand the process of bringing basic research into applications that directly benefit their health and well-being. Biological science education is in serious trouble as indicated by the rapid decline in numbers of college students

graduating with degrees in biomedical science. Education of the general public, our young people and their teachers is of vital importance to the future of science and biomedical research.

The current misconceptions about the use of animal models in research are of great concern. Science teachers in the elementary, middle and high schools must be provided information on the relevancy of animal research and the roles that animals play in scientific and medical progress. At all levels of society, the facts concerning the process of medical discovery must be instilled. Without exposure to the truth concerning research, many of our next generations will be deceived into believing that biomedical research, particularly that involving animals, is unnecessary.

Mission - SwAEBR has been formed with the specific mission of developing and implementing a strong proactive campaign to educate school children, as well as the general public, in the vital role biomedical research plays in their everyday lives. The Association will disseminate information necessary to improve the public's understanding of how responsible and humane animal research has led to significantly improved health care for man and his animal companions.

Friends of SwAEBR: Individuals may support the Association through honorary membership known as Friends of SwAEBR. Friends are not required to pay dues, not entitled to vote, and have access to all services and programs sponsored by the Association.

How Can You Help?

Provide financial support - For general support, production of educational resources and sponsorship of the summer internship program.

Serve on our speakers bureau - Speakers are frequently requested for classroom and organization presentations. This increases the visibility of your company, SwAEBR, as well as educating the public.

How Will Your Company Benefit?

*Your website can be linked through our actively viewed webpage.

*Satisfaction of contributing to the education of promoting biomedical research.

*Through sponsoring the essay contest winners your company directly affects the workforce of tomorrow by enhancing their interest in science and technology.

For more information:

See website at www.swaebr.org or contact:

SwAEBR

P.O. Box 210121

Tucson, AZ 85721-0101

(520)621-3931

Email: swaebr@ahsc.arizona.edu

**Coalition For Animals & Animal Research - CFAAR
2003 Membership Application**

Name: _____

Mailing Address: (Campus, if available) _____

Phone: _____ Fax: _____

Electronic Mail: _____ Send me my newsletter electronically _____
(In an attempt to reduce the cost of printing we hope to send most newsletters electronically.)

Institutional Affiliation (if any): _____

Faculty ()

Staff ()

Student ()

Other ()

I have enclosed a contribution of \$20 \$50 \$100 Other _____

A years subscription to CFAAR News is included with your donation.

Make checks payable to **CFAAR** and return to: **CFAAR**, P.O. Box 210101, Tucson, AZ, 85721

CFAAR ARIZONA

University of Arizona

P.O. Box 210101

Tucson, AZ 85721-0101

Address Correction Requested

181040

Please join AZ CFAAR Today!

**Your Donations Make Our Publications Possible
We Hope To Get A Website Up & Running with Your Donations**