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PRO:

Animal testing has contributed to many life-saving cures and treatments. The California Biomedical Research Association states that nearly every medical breakthrough in the last 100 years has resulted directly from research using animals. Experiments in which dogs had their pancreases removed led directly to the discovery of insulin, critical to saving the lives of diabetics. The polio vaccine, tested on animals, reduced the global occurrence of the disease from 350,000 cases in 1988 to 223 cases in 2012. Animal research has also contributed to major advances in understanding and treating conditions such as breast cancer, brain injury, childhood leukemia, cystic fibrosis, malaria, multiple sclerosis, tuberculosis, and many others, and was instrumental in the development of pacemakers, cardiac valve substitutes, and anesthetics. Chris Abee, Director of the University of Texas M.D. Anderson Cancer Center's animal research facility, states that "we wouldn't have a vaccine for hepatitis B without chimpanzees," and says that the use of chimps is "our best hope" for finding a vaccine for Hepatitis C, a disease that kills 15,000 people every year in the United States. . . .

Animals must be used in cases when ethical considerations prevent the use of human subjects. When testing medicines for potential toxicity, the lives of human volunteers should not be put in danger unnecessarily. It would be unethical to perform invasive experimental procedures on human beings before the methods have been tested on animals, and some experiments involve genetic manipulation that would be unacceptable to impose on human subjects before animal testing. The World Medical Association Declaration of Helsinki states that human trials should be preceded by tests on animals.

Animals themselves benefit from the results of animal testing. If vaccines were not tested on animals, millions of animals would have died from rabies, distemper, feline leukemia, infectious hepatitis virus, tetanus, anthrax, and canine parvo virus. Treatments for animals developed using animal testing also include pacemakers for heart disease and remedies for glaucoma and hip dysplasia. Animal testing has also been instrumental in saving endangered species from extinction, including the black-footed ferret, the California condor and the tamarins of Brazil. Koalas, ravaged by an epidemic of sexually transmitted chlamydia and now classified as endangered in some regions of Australia, are being tested with new chlamydia vaccines that may stall the animal's disappearance. The American Veterinary Medical Association (AVMA) endorses animal testing.

Animal research is highly regulated, with laws in place to protect animals from mistreatment. In addition to local and state laws and guidelines, animal research has been regulated by the federal Animal Welfare Act (AWA) since 1966. As well as stipulating minimum housing standards for research animals (enclosure size,

temperature, access to clean food and water, and others), the AWA also requires regular inspections by veterinarians. All proposals to use animals for research must be approved by an Institutional Animal Care and Use Committee (IACUC) set up by each research facility. Humane treatment is enforced by each facility's IACUC, and most major research institutions' programs are voluntarily reviewed for humane practices by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC). All institutions receiving funding from the US Public Health Service (PHS) must comply with the PHS Policy on Humane Care and Use of Laboratory Animals. . . .

Animal researchers treat animals humanely, both for the animals' sake and to ensure reliable test results. Research animals are cared for by veterinarians, husbandry specialists, and animal health technicians to ensure their well-being and more accurate findings. According to the journal *Nature Genetics*, because "stressed or crowded animals produce unreliable research results, and many phenotypes are only accessible in contented animals in enriched environments, it is in the best interests of the researchers not to cut corners or to neglect welfare issues." At Cedars-Sinai Medical Center's animal research facility, for example, dogs are given exercise breaks twice daily, when they can socialize with their caretakers and other dogs, and a "toy rotation program" provides opportunities for play. . . .

Relatively few animals are used in research, which is a small price to pay for advancing medical progress. People in the United States eat 9 billion chickens and 150 million cattle, pigs and sheep annually, yet we only use around 26 million animals for research, 95% of which are rodents, birds and fish. We eat more than 1,800 times the number of pigs than the number used in research, and we consume more than 340 chickens for every research animal.

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CON:

Animal testing is cruel and inhumane. According to Humane Society International, animals used in experiments are commonly subjected to force feeding, forced inhalation, food and water deprivation, prolonged periods of physical restraint, the infliction of burns and other wounds to study the healing process, the infliction of pain to study its effects and remedies, and "killing by carbon dioxide asphyxiation, neck-breaking, decapitation, or other means." The Draize eye test, used by cosmetics companies to evaluate irritation caused by shampoos and other products, involves rabbits being incapacitated in stocks with their eyelids held open by clips, sometimes for multiple days, so they cannot blink away the products being tested. The commonly used LD50 (lethal dose 50) test involves finding out which dose of a chemical will kill 50% of the animals being used in the experiment. The US Department of Agriculture (USDA) reported in 2010 that 97,123 animals suffered pain during experiments while being given no anesthesia for relief, including 1,395 primates, 5,996 rabbits, 33,652 guinea pigs, and 48,015 hamsters.

Alternative testing methods now exist that can replace the need for animals. In vitro (in glass) testing, such as studying cell cultures in a petri dish, can produce more relevant results than animal testing because human cells can be used. Microdosing, the administering of doses too small to cause adverse reactions, can be used in human volunteers, whose blood is then analyzed. Artificial human skin, such as the commercially available products EpiDerm and ThinCert, is made from sheets of human skin cells grown in test tubes or plastic wells and can produce more useful results than testing chemicals on animal skin. Microfluidic chips ("organs on a chip"), which are lined with human cells and recreate the functions of human organs, are in advanced stages of development. Computer models, such as virtual reconstructions of human molecular structures, can predict the toxicity of substances without invasive experiments on animals. . . .

Drugs that pass animal tests are not necessarily safe. The 1950s sleeping pill thalidomide, which caused 10,000 babies to be born with severe deformities, was tested on animals prior to its commercial release. Later tests on pregnant mice, rats, guinea pigs, cats, and hamsters did not result in birth defects unless the drug was administered at extremely high doses. Animal tests on the arthritis drug Vioxx showed that it had a protective effect on the hearts of mice, yet the drug went on to cause more than 27,000 heart attacks and sudden cardiac deaths before being pulled from the market. . . .

95% of animals used in experiments are not protected by the Animal Welfare Act. The AWA does not cover rats, mice, fish and birds, which comprise around 95% of the animals used in research. The AWA covered 1,134,693 animals used for testing in fiscal year 2010, which leaves around 25 million other animals that are not covered. These

animals are especially vulnerable to mistreatment and abuse without the protection of the AWA. . . .

Most experiments involving animals are flawed, wasting the lives of the animal subjects. A 2009 peer-reviewed study found serious flaws in the majority of publicly funded US and UK animal studies using rodents and primates. 87% of the studies failed to randomize the selection of animals (a technique used to reduce "selection bias") and 86% did not use "blinding" (another technique to reduce researcher bias). Also, "only 59% of the studies stated the hypothesis or objective of the study and the number and characteristics of the animals used." Since the majority of animals used in biomedical research are killed during or after the experiments, and since many suffer during the studies, the lives and wellbeing of animals are routinely sacrificed for poor research. . . .

The Animal Welfare Act has not succeeded in preventing horrific cases of animal abuse in research laboratories. In Mar. 2009, the Humane Society of the United States (HSUS) found 338 possible violations of the Animal Welfare Act at the federally funded New Iberia Research Center (NIRC) in Louisiana. Some of the primates housed at NIRC were suffering such severe psychological stress that they engaged in self-mutilation, "tearing gaping wounds into their arms and legs." Video footage shows infant chimps screaming as they are forcibly removed from their mothers, infant primates awake and alert during painful experiments, and chimpanzees being intimidated and shot with a dart gun. In a 2011 incident at the University of California at Davis Center for Neuroscience, "three baby mice were found sealed alive in a plastic baggie and left unattended" on a laboratory counter, according to the Sacramento Bee. . . .

Medical breakthroughs involving animal research may still have been made without the use of animals. There is no evidence that animal experiments were essential in making major medical advances, and if enough money and resources were devoted to animal-free alternatives, other solutions would be found.