Non Animal Techniques In Biomedical And Behavioral Research And Testing

Animal testing Experimental research with animals is usually conducted in universities, medical schools, pharmaceutical companies, defense establishments, and commercial facilities that provide animal-testing services to the industry. Animal testing, also known as animal experimentation, animal research, and in vivo testing, is the use of animals, as model organisms, in experiments Animal testing, also known as animal experimentation, animal research, and in vivo testing, is the use of animals, as model organisms, in experiments that seek answers to scientific and medical questions. This approach can be contrasted with field studies in which animals are observed in their natural environments or habitats. The focus of animal testing varies on a continuum from pure research, focusing on developing fundamental knowledge of an organism, to applied research, which may focus on answering some questions of great practical importance, such as finding a cure for ae276e7523

Refinement: use of methods that alleviate or minimize potential pain, suffering, distress, or lasting harm and improve welfare for the animals used. ae276e7523 With the exception of some cephalopods in the European Union, invertebrate species are not protected under most animal research legislation, and therefore the total number of invertebrates used remains unknown. ae276e7523 Reduction: use of methods that enable researchers to minimise the number of animals necessary to obtain reliable and useful information. ae276e7523 Their use is controversial. According to the Nuffield Council on Bioethics, NHPs are used because their brains share structural and functional features with human brains, but "while this similarity has scientific advantages, it poses some difficult ethical problems, because of an increased likelihood that primates experience pain and suffering in ways that are similar to... ae276e7523 The 3Rs have a broader scope than simply encouraging alternatives to animal testing, but aim to improve animal welfare and scientific quality where the use of animals cannot be avoided. In many countries, these 3Rs are now explicit in legislation... ae276e7523 Homologous animals have the same causes, symptoms and treatment options as would humans who have the same disease... ae276e7523 Replacement: methods which avoid the use of animals in research ae276e7523

Medical research Palliative medicine Animal testing Biomedical informatics Biomedical research in the United States Biomedical technology Biomedicine Cancer research Gain-of-function Medical research (or biomedical research), also known as health research, refers to the process of using scientific methods with the aim to produce knowledge about human diseases, the prevention and treatment of illness, and the promotion of health ae276e7523

Model organism Use of Laboratory Animals in Biomedical and Behavioral Research A model organism is a non-human species that is extensively studied to understand particular biological phenomena, with the expectation that discoveries made in the model organism will provide insight into the workings of other organisms. Model organisms are widely used to research human disease when human experimentation would be unfeasible or unethical. developing and testing new therapies. National Research Council and Institute of Medicine (1988). This strategy is made possible by the common descent of all living organisms, and the conservation of metabolic and developmental pathways and genetic material over the course of evolution ae276e7523

Open field (animal test) open field test (OFT) is an experimental test used to assay general locomotor activity levels, anxiety, and willingness to explore in animals (usually rodents) Developed by Calvin S. The open field test can be used to assess memory by evaluating the ability of the animal to recognize a stimulus or object. Another animal test that is used to assess memory using that same concept is the novel object recognition test. However, the extent to which behavior in the open field measures anxiety is controversial. Hall, the open field test (OFT) is an experimental test used to assay general locomotor activity levels, anxiety, and willingness to explore in animals (usually rodents) in scientific research ae276e7523

Animal testing on non-human primates in their "Chimpanzees in Biomedical and Behavioral Research: Assessing the Necessity" report that, "while the chimpanzee has been a valuable animal model Experiments involving non-human primates (NHPs) include toxicity testing for medical and non-medical substances; studies of infectious disease, such as HIV and hepatitis; neurological studies; behavior and cognition; reproduction; genetics; and xenotransplantation. Most are purpose-bred, while some are caught in the wild. Around 65,000 NHPs are used every year in the United States, and around 7,000 across the European Union ae276e7523

Animal testing on invertebrates These animals offer scientists many

advantages over vertebrates, including their short life cycle, simple anatomy and the ease with which large numbers of individuals may be studied. Animal testing on non-human primates Animal testing on rodents Testing cosmetics on animals Pain in invertebrates Andre, RG, RA Wirtz, and YT Das Most animal testing involves invertebrates, especially Drosophila melanogaster, a fruit fly, and Caenorhabditis elegans, a nematode. behavior. Invertebrates are often cost-effective, as thousands of flies or nematodes can be housed in a single room ae276e7523

Animal testing on rodents Rodent studies up to the early 19th century were mainly physiological or toxicological. Currently, rodents are commonly used in animal testing for physiological, pathological and behavioral scientific studies, particularly mice and rats, but also guinea pigs, hamsters, gerbils and others. first rodent behavioral study was carried out in 1822, a purely observational study, while quantitative rodent behavioral testing began in the late 19th Rodents have been employed in biomedical experimentation from the 1650s. The first rodent behavioral study was carried out in 1822, a purely observational study, while quantitative rodent behavioral testing began in the late 19th century. Mice are the most commonly used vertebrate species, due to their availability, size, low cost, ease of handling, and fast reproduction rate ae276e7523

Research using animal models has been central to most of the achievements of modern medicine. It has contributed most of the basic knowledge in fields such as human physiology and biochemistry, and has played significant roles in fields such as neuroscience... ae276e7523

Animal disease model An animal model (short for animal disease model) is a living, non-human, often genetic-engineered animal used during the research and investigation of An animal model (short for animal disease model) is a living, non-human, often genetic-engineered animal used during the research and investigation of human disease, for the purpose of better understanding the disease process without the risk of harming a human. Animal models representing specific taxonomic groups in the research and study of developmental processes are also referred to as model organisms. There are three main types of animal models: Homologous, Isomorphic and Predictive. Although biological activity in an animal model does not ensure an effect in humans, many drugs, treatments and cures for human diseases are developed in part with the guidance of animal models ae276e7523

Medical research encompasses a wide array of research, extending from "basic research" (also called bench science or bench research), —

involving fundamental scientific principles that may apply to a preclinical understanding – to clinical research, which involves studies of people who may be subjects in clinical trials. Within this spectrum is applied research, or translational research, conducted to expand knowledge in the field of medicine. ae276e7523 Both clinical and preclinical research phases exist in the pharmaceutical industry's drug development pipelines... ae276e7523

Biomedical scientist research. These scientists work to gain knowledge on the main principles of how the human body works and to find new ways to cure or treat disease by developing advanced diagnostic tools or new therapeutic strategies. Biomedical scientists employ a variety of techniques in order to carry out laboratory experiments. These include: Molecular and biochemical A biomedical scientist is a scientist trained in biology, particularly in the context of medical laboratory sciences or laboratory medicine. The research of biomedical scientists is referred to as biomedical research ae276e7523

Three Rs (animal research) L. The 3Rs are: The Three Rs (3Rs) are guiding principles for more ethical use of animals in product testing and scientific research. Russell and R. Burch in 1959. Russell and R. They were first described by W. S. Burch in 1959. M. The 3Rs are:. They were first described by W. more ethical use of animals in product testing and scientific research. S. L. M ae276e7523