

**Drugs and Cosmetics Testing on Animals: Humanities and Strict Laws****Advancement Needs**Aman Guru<sup>1</sup>, Devansh Sarswat<sup>2</sup><sup>1,2</sup>BA LLB (HONS), I Year, Symbiosis Law School,  
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**ABSTRACT:** This paper brings a note on the atrocities on animals for experiments in drugs and cosmetics testing. This practice of animal testing is cruel, inhumane, and barbaric and not 100% productive.

Every year, more than 100 million animals—including mice, rats, frogs, dogs, cats, rabbits, hamsters, guinea pigs, monkeys, fish, and birds—are killed worldwide for biology lessons, medical training, curiosity-driven experimentation, and chemical, drug, food, and cosmetics testing. The thinking, feeling animals, which are used in experiments are treated like nothing more than disposable laboratory equipment.

Researchers have found that medical treatments developed in animals rarely translated to humans because diseases that are artificially induced in animals in a laboratory, are never identical to those that occur naturally in human beings because animal species differ from human species. In modern world, umpteen animals are subjected to experiments but only 8% of the products that are tested are not passed by the FDA and 92% of them end up being harmful, poisonous, or deadly.

In 2009 UN passed into a law banning on testing animals for cosmetic purpose according to this it is illegal to sell products that has been tested on animals anywhere in the world. Instead of revising such things, doing research for finding a good alternative can be a noble cause to do and this requires strict laws to be formed and followed globally. This research emphasizes upon different laws for these activities, ethical issues related to this and some alternatives for this so that this cruelty on animals is stopped as they are partners to human right from the evolution of the society.

**Keywords:** Atrocities, Experimentation, Illegal, Ethical, Alternative

**INTRODUCTION**

**Animal testing**, also known as **animal experimentation**, **animal research** is the use of non-human animals in experiments that seeks to control the variables that affect the behavior or biological system under study. This approach can be contrasted with field studies in which animals are observed in their natural environment. Experimental research with animals is usually conducted in universities, medical schools, pharmaceutical companies, defense

establishments, and commercial facilities that provide animal-testing services to industry<sup>1</sup>. Umpteen monkeys, dogs, rats and other animals are burned, blinded, cut open, poisoned, starved and drugged behind closed laboratory doors every year for convenience, for economic reasons which in turn proves worthless to the society at large. Worldwide it is estimated that the number of vertebrates—from [zebrafish](#) to [primates](#) ranges from the tens of millions to more than 100 million used annually. In the US in 2014, official statistics demonstrate that 834,453 vertebrates were used in research<sup>2</sup>.

<sup>1</sup> "Introduction", Select Committee on Animals in Scientific Procedures Report". *UK Parliament*. Retrieved 2012-07-13. (Jun. 17 2017, 11:28 p.m.). <https://www.publications.parliament.uk/pa/ld200102/ldselect/ldanimal/150/15004.htm#a7>

<sup>2</sup> Meredith Cohn (2010-08-26). "Alternatives to Animal Testing Gaining Ground," *The Baltimore Sun*. (Jun. 17 2017, 1:00 p.m.).

Not only are animal tests extremely cruel, they are also completely inaccurate because of the vast physiological variations between species. Animal studies teach us nothing about the health of humans because human reactions to illnesses and medications are completely different from the reactions of other animals. Other species absorb, metabolize and eliminate substances differently than humans do. The truth is that testing on animals is just plain bad science which harms humans and other animals alike. During an administration meeting about funding for research, previous U.S. National Institutes of Health chief Dr. Elias Zerhouni<sup>1</sup> conceded that probing creatures to help people has been a noteworthy failure. He told his colleagues:

*"We have moved away from studying human disease in humans. ... We all drank the Kool-Aid on that one, me included. ... The problem is that [animal testing] hasn't worked, and it's time we stopped dancing around the problem. ... We need to refocus and adapt new methodologies for use in humans to understand disease biology in humans."* —Dr. Elias Zerhouni.

Today since experiments on animal are cruel, costly, and by and large inapplicable to people the world's most ground-breaking researchers have proceeded onward to create and utilize strategies for examining maladies and testing items that supplant creatures and are pertinent to human wellbeing. These present-day strategies incorporate refined tests utilizing human cells and tissues (otherwise called in vitro techniques), propelled computer demonstrating methods (regularly alluded to as in silico models), and concentrates with human volunteers. These and other non-creature techniques are not blocked by species contrasts that make applying creature test results to people troublesome or unthinkable, and they for the most part take less time and money to complete.

<sup>3</sup> Dr. Elias zerhouni (Jun. 19, 2017, 1:00 p.m.). <https://www.nih.gov/about-nih/what-we-do/nih-almanac/elias-zerhouni-md>.

## VIVISECTION

Alec Baldwin, Grace Slick, Andy Dick, Linda Blair, Rue McClanahan, Alicia Silverstone, Kathy Najimy and Mo Gaffney are among the many notable scientists who have stated their opposition to the use of animals for experimentation. "Vivisection is bad for both humans and animals", says Grace Slick.

Vivisection is the act of experimenting on the live creatures. Numerous vivisectors come to India because in their own nations, they can't escape with doing the sort of creature testing they can here. Consistently, explore offices crosswise over India – including the Animal Research Center, the Patel Chest Institute, the National Institute of Nutrition (NIN) and the All India Institute of Medical Sciences (AIIMS), just to give some examples – waste profitable time and assets and in addition a millions of rupees leading analyses on monkeys, puppies, felines, rabbits, rats, mice and different creatures which thusly can turn out to be more productive if human based test are favored over creature tests. How numerous more individuals need to endure and bite the dust before we understand that, on the off chance that we truly need to help ourselves, we must remove the creature trials and concentrate on more powerful human-based tests and some of them are listed below.

## In Vitro Testing

Harvard's Wyss Institute has made "organs-on-chips" that contain human cells developed in a best in class framework to copy the structure and capacity of human organs and organ frameworks The chips can be used instead of animals in disease research, drug testing, and toxicity testing and have been shown to replicate human physiology, diseases, and drug

responses more accurately than crude animal experiments do. Some companies, such as the HµRel Corporation, have already turned these chips into products that other researchers can use in place of animals.

A variety of cell-based tests and tissue models can be used to assess the safety of drugs, chemicals, cosmetics, and consumer products. CeeTox (bought byCyprotex) developed a method to assess the potential of a substance to cause askin allergy in humans

that incorporates MatTek’s EpiDerm™ Tissue Model—a 3-dimensional, human cell–derived skin model that replicates key traits of normal human skin. It replaces the use of guinea pigs or mice, who would have been injected with a substance or had it applied to their shaved skin to determine an allergic response. MatTek’s EpiDerm™ is also being used to replace rabbits in painful, prolonged experiments that have traditionally been used to evaluate chemicals for their ability to corrode or irritate the skin.

Researchers at the European Union Reference Library for alternatives to animal testing developed five different tests that use human blood cells to detect contaminants in drugs that cause a potentially dangerous fever response when they enter the body. The non-animal methods replace the crude use of rabbits in this painful procedure.

### **Computer (in silico) Modeling**

Researchers have built up an extensive variety of sophisticated computer models that mimic human science and the movement of developing ailments. Studies demonstrate that these models can precisely foresee the ways that new medications will respond in the human body and supplant the utilization of creatures in exploratory research and numerous standard medication tests.

Quantitative structure-activity relationships (QSARs) are computer-based techniques that can supplant creature tests by making refined assessments of a substance’s probability of being unsafe, in light of its likeness to existing substances

and our insight into human science. Organizations and governments are progressively utilizing QSAR devices to maintain a strategic distance from creature testing of chemicals, and PETA effectively advances and supports their utilization globally.

### **Research with Human Volunteers**

A method called “micro-dosing” can give indispensable data on the wellbeing of an exploratory medication and how it is utilized in people preceding huge scale human trials. Volunteers are given a to a great degree little one-time medicate measurements, and advanced imaging systems are utilized to screen how the medication carries on in the body. Micro dosing can supplant certain tests on animals and help screen out medication aggravates that won’t work in people with the goal that they won’t unnecessarily progress to government-required animal testing.

Advanced cerebrum imaging and recording techniques, for example, functional magnetic resonance imaging (fMRI) with human volunteers can be utilized to supplant antiquated investigations in which rats, cats, and monkeys have their brains harmed. These present-day methods enable the human mind to be securely considered down to the level of a solitary neuron (as on account of intracranial electroencephalography), and specialists can even incidentally and reversibly instigate cerebrum issue utilizing trans-cranial magnetic stimulation.

### **Human-Patient Simulators**

Strikingly life-like modernized human-patient simulators that breathe, bleed, convulse, talk, and even “die” have been appeared to show understudies physiology and pharmacology superior to unrefined activities that include cutting up creatures. The most cutting-edge test systems imitate ailments and wounds and give the suitable organic reaction to medicinal intercessions and infusions of prescriptions. Ninety-seven percent of therapeutic schools over the U.S. have totally supplanted the utilization of creature research facilities in medicinal preparing with test systems like this, and also virtual-

reality frameworks, PC test systems, and administered clinical experience.

For more propelled medicinal preparing, frameworks like Trauma Man—which recreates a breathing, draining human middle and has practical layers of skin and tissue, ribs, and inward organs—are broadly used to show crisis surgical methods and have been appeared in various investigations to grant lifesaving aptitudes better than courses that oblige understudies to cut into live pigs, goats, or dogs.

Even though the Committee with the end goal of Control and Supervision of Experimentation on Animals (CPCSEA) – which was made under the arrangements of the Prevention of Cruelty to Animals Act 1960 – should help actualize good laboratory practices and guarantee that animal testing is done under legitimate conditions, creature inquire about in India is famously loaded with issues. Numerous pharmaceutical organizations don't utilize full-time veterinarians to deal with animals on an everyday premise or overseers to take care of the creatures during the evening. A large portion of the methodology is performed by understudies. Lodging conditions are hopeless because numerous labs don't furnish creatures with aerating and cooling, legitimate lighting, or clean water jugs, enclosures and nourishment which in turn make the circumstance more pathetic for animals.

The UK-based National Anti-Vivisection Society (NAVS) issued a cover Indian animal testing in light of an audit of Indian research papers in the worldwide logical writing and CPCSEA's investigations of 467 labs. NAVS discovered key blames in the creature testing industry in India and inferred that times of logical research in India have been refuted by poor logical technique, poor laboratory practices and an absence of appropriate animal's care.

PETA US has directed numerous undercover investigations. Each time it does, physical mishandle and disregard are recorded. Animals are shouted at, hit, left to endure after surgery with no painkillers, packed into little confines, denied veterinary care and more. In India, one of the biggest animal

providers, the National Center for Laboratory Animal Sciences (NCLAS) in Hyderabad, supplies around 50,000 creatures to research facilities consistently and to 175 establishments in India, including pharmaceutical organizations and instructive foundations. Both NCLAS and the NIN have been under flame from animal insurance associations for a considerable length of time for not keeping up fundamental animal welfare gauges. As indicated by The Hindu, NIN has kept monkeys, who are exceptionally social, in isolation for up to 12 years.

A couple of years back, PETA and the CPCSEA safeguarded a monkey named Paro and 36 others from Pune's National Institute of Virology (NIV) in the wake of revealing horrendous conditions. Not able to give even one record to any of the creatures it utilized, NIV had bound most of its monkeys to modest enclosures for over 10 years, and some had been distorted or incapacitated from imprisonment and manhandle. Some monkeys were missing fingers and teeth, while others – who had gone crazy from years of concentrated control – spun in circles around their cages.

In June 2002, members of the CPCSEA inspected the dog-housing facilities of Delhi's Ranbaxy Laboratories and found that most of the animals were suffering from dermatitis, infectious diseases and defects that resulted from inbreeding. At AIIMS, primates were housed in old, rusty cages, and they were inappropriately grouped for their social behavior patterns. Scientists at AIIMS have not submitted required final reports for nearly half of the 339 projects which they completed between 1991 and 2000.

### MEDICAL RESEARCH

The most significant pattern in current research in recent years has been the acknowledgment that creatures are once in a while decent models for the human body. Studies have indicated over and over that analysts regularly squander lives – both animals and human – and valuable assets by attempting to taint animals with infections which they would not typically contract. As Dr Richard Klausner of the



US' National Cancer Institute conceded, "The history of cancer research has been a history of curing cancer in the mouse. We have cured mice of cancer for decades, and it simply didn't work in humans!".

In many cases, not only does animal testing hurt animals and waste money, it also harms and kills humans. For example, thalidomide, Zomax and DES were all tested on animals and judged safe, but they had devastating consequences for the people who used them. Animal testing wastes time, too, by leading researchers in the wrong direction. Dr Albert Sabin, who developed the oral polio vaccine, cited in testimony at a US congressional hearing that his work had been "delayed by a wrong origination of the way of the human disease in light of deceiving test models of the disease in monkeys". Similarly, 150 years of drug tests on animals have produced 25 drugs to combat strokes – none of which work in humans. Each false lead generates more fruitless studies, which eat up more time and money while humans and animals suffer.

Almost all-important developments in health are attributable to human studies, including anesthesia; bacteriology; germ theory; the stethoscope; morphine; radium; penicillin; artificial respiration; antiseptics; the CAT, MRI and PET scans; the discoveries of the relationships between cholesterol and heart disease, between smoking and cancer and between diet and other illnesses; the development of X-rays and the isolation of the virus which causes AIDS. Animal testing have not contributed to these and many other developments.

### **HUMANE MEDICAL RESEARCH**

It is not surprising that those who make money from animal testing insist that nearly every medical advance has been made using animals. But as many innovative companies and scientists today are proving, there are always alternatives to the use and abuse of animals. Clinical trials, the use of human volunteers, case studies, autopsy reports and

<sup>4</sup><https://www.youtube.com/watch?v=nzL8Pscb10> link of speech of Dr Richard Klausner on how we can step forth on curing cancer.

statistical analyses permit far more accurate observation – as well as the use of actual environmental factors related to human disease – than is possible with animals that are confined to laboratories.

The world's most forward-thinking companies and scientists have moved on to more humane, cutting-edge methods of studying disease. The National Cancer Institute now uses human cancer cells – taken by biopsy during surgeries – to perform first-stage testing for its new anti-cancer drugs. This practice spares the lives of the millions of mice whom the institute previously used every year and gives the institute a much better shot at combating against cancer and if fact curing it.

Pharmagene Laboratories, a pharmaceutical company in England, uses sophisticated computer technologies which show the effects of chemicals on the human body. US-based Physiome Sciences has developed software programs which simulate the human body's organs and processes. These software programs are so advanced that they can be used to predict the effects of drug therapies for a variety of diseases.

TOPKAT, a software package available in India, allows researchers to predict chemicals' oral toxicity as well as their degree of skin and eye irritation. Faster, cheaper and more accurate than animal tests, TOPKAT is now used by the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) in the US as well as by the US Army. Also available in India is a CD developed by JIPMER<sup>1</sup> which has been specially designed and prepared to replace all animals used in undergraduate courses in pharmacology, medicine and veterinary science.

## PRODUCT TESTING

Even though no law in any country requires cosmetics or personal-care products to be tested on animals, many companies around the world choose to subject animals to painful tests in which substances are dripped into their eyes, smeared on their skin, sprayed in their faces or forced down their throats. Two of the most common animal tests are eye irritancy and lethal dose tests.

In eye irritancy tests, chemicals are dripped into the eyes of albino rabbits, who have no tear ducts, which makes them unable to cry to wash away the toxic chemicals<sup>1</sup>. The animals are usually immobilized in stocks, and only their heads protrude. Their eyelids are held open with clips. After placing the chemicals in the rabbits' eyes<sup>2</sup>, laboratory technicians record the damage to the eye tissue, which can include inflamed irises, ulceration, bleeding, massive deterioration and blindness. Often, the rabbits receive no anesthesia during the tests. Many rabbits break their backs as they struggle to escape the pain.

In acute toxicity tests, increasing amounts of detergent, eye shadow and other products are forced to rats; mice, rabbits, guinea pigs and other animals until a certain percentage of them are poisoned to death. The infamous Lethal Dose<sub>50</sub> (LD<sub>50</sub>) test is the most common form of animal-poisoning study. It is used to determine what concentration of a substance is needed to kill 50 per cent of a group of animals.

Animals who receive the highest doses endure severe abdominal pain, diarrhea, convulsions, seizures, paralysis and bleeding from the nose, mouth and genitals before they finally die. PETA has video footage<sup>8</sup> of rabbits<sup>9</sup> whose tender skin has been eaten away by corrosive substances, rats in death throes

after huge amounts of soaps have been pumped into their stomachs and dogs who cover alone in box-like cages.

These extremely cruel tests often produce inaccurate or misleading results. The scoring of eye damage in irritancy tests is highly subjective<sup>5</sup>. Different laboratories – and even different tests within the same laboratory – often yield different results<sup>6</sup>. Plus, rabbits' eyes are anatomically and physiologically different from humans' eyes and tend to react more strongly to chemicals.

Like eye irritancy tests, lethal dose tests are unreliable and have too many variables to give accurate results. One international study, which examined the results of rat and mouse LD<sub>50</sub> tests for 50 chemicals, found that these tests could predict toxicity in humans with only 65 per cent accuracy.

So why test on animals? Some critics have maintained that data from animal testing are only used to defend companies against consumer lawsuits, which leaves consumers vulnerable to unsafe products marketed by unscrupulous, greedy companies.

## HUMANE ALTERNATIVES TO TESTING PRODUCTS ON ANIMALS

With so many sophisticated non-animal product tests now available, companies have no excuse for continuing to torment animals. Instead of measuring how long it takes a chemical to burn away the cornea<sup>7</sup> of a rabbit's eye, manufacturers can now drop that chemical onto donated human corneas. The Irritation Assay System, a simple test-tube procedure, spares millions of animals from horrific eye- and skin-irritation tests. Human skin cultures can also be grown and ordered for irritancy testing. All these and dozens more tests now in use today are cheaper and faster than animal tests and more accurately predict humans' reactions to products.

<sup>5</sup>The Jawaharlal Institute of Postgraduate Medical Education & Research is a medical school in India, and the oldest to teach European medicine in Asia. It is located at Pondicherry.

<sup>6</sup>Krikwilhelmus professor in department of ophthalmology at Baylor college of medicine conducted a comprehensive review of the draize test and found that testing substance on rabbit might not predict the effect on humans.

<sup>8</sup><https://www.youtube.com/watch?v=d4m-Fgol0q8>

<sup>9</sup><https://www.youtube.com/watch?v=wWgoxblzFhc>

In addition, companies can use computer and mathematical models. They can also choose to use ingredients and chemicals which have already been proved to be harmless and are known to be safe.

### BECOMING COMPASSIONATE CONSUMERS

In 1996, the Bureau of Indian Standards made the use of animal testing for cosmetics optional. The European Parliament recently voted in favor of imposing a ban on the sale of all new cosmetics products which have been tested on animals. "Those products should no longer be sold", said Dagmar Roth-Behrendt, the German Socialist member of the European Parliament who authored the legislative bill which imposed the ban. "Alternative methods must be applied and used . . . . Eventually, this should lead to a full ban on sales of all products where animal testing was used." The ban will also apply to all imports of animal-tested cosmetics. To impose a similar ban in India, PETA has written numerous letters to the Ministry of Environment & Forests and the Ministry of Health & Family Welfare. PETA's suggestion was endorsed by the Indian Council of Medical Research.

Luckily, times are changing, and roughly 800 manufacturers of cosmetics, toiletries and household products – including profitable and innovative industry leaders such as Revlon, Avon and Clinique – have stopped tormenting animals in painful, useless tests.

Consumers can help end animal testing for good by buying only products which have not been tested on animals.

#### ANIMAL WELFARE ACT.

The Animal Welfare Act (AWA) (7 U.S.C. § 2131) is the only U.S. federal law that covers animals in research. (The government Public Health Service Policy on the Humane Care and Use of Laboratory animals cover animal in NIH-subsidized research

<sup>10</sup>Stephen R. Kaufman, M.D "As an ophthalmologist, I strongly support use of alternatives to the Draize test to determine ocular irritancy of cosmetic and household products. The Draize test is scientifically unsound and inapplicable to clinical situations. Reliance on this test is in fact dangerous, because the animal data cannot be reliably extrapolated to man. Substances "proven" safe in lab animals may in fact be dangerous to people".

<sup>11</sup> "I have never used Draize data to assist the care of a patient. Furthermore, I know of no case in which another ophthalmologist found Draize data useful" said by Stephen R. Kaufman, M.D.

<sup>12</sup>The transparent layer forming the front of the eye.

through suggested arrangement just, not prerequisites. While it can investigate, it depends on self-detailing.) Enacted in 1966, it controls the care and utilization of animal in examine, testing, educating, display, transport, and by merchants. In any case, the AWA gives just negligible insurance to specific species while barring others, for example, rats, mice, and winged animal reproduced for inquire about—who together constitute an expected 90-95% of creature in research centers. It excludes cold-blooded animals (fish, reptiles, and creatures of land and water), and additionally farmed animals raised for sustenance and fiber or utilized as a part of farming examination—e.g., cow and pigs. For the under 10% of animals in labs secured by the AWA (dogs, cats, nonhuman primates—such as chimpanzees and monkeys—guinea pigs, hamsters, rabbits, and other warm-blooded animals), the law sets negligible benchmarks for housing, feeding, handling with, veterinary care, and for a few animal categories like chimpanzees, their mental well-being.

#### USDA

The U.S. Department of Agriculture (USDA) is charged with enforcing the AWA. The USDA's Animal and Plant Health Inspection Service (APHIS) Animal Care program administers AWA regulations and standards. Under the AWA, businesses and individuals using regulated animals must be licensed or registered with the USDA and facilities with regulated animals must be inspected yearly by APHIS. There is no legal necessity for the examination of federally possessed and operated research facilities. The USDA has no purview over offices utilizing creatures not secured under the AWA.

The USDA's 2009 Annual Report showed that analysts utilized more than 76,000 (AWA-secured)

animals in research that made unrelieved agony and misery the animals.

**At the point when the USDA discovers facilities in non-compliance with AWA regulations, they may issue punishments—regularly so little as to be irrelevant. For instance, in 2004 a 10-year-old chimpanzee named Dover died from overheating because of improper ventilation in a “stainless steel box with strong ground surface, rooftop, back and sides” amid travel at the Yerkes National Primate Research Center.** The USDA fined Yerkes a trivial \$1,375 for negligence leading to Dover’s death. In 2008, maximum fines under the AWA were increased from \$2,500 per violation to \$10,000, but for facilities bringing in millions of dollars from animal research, these fines are simply the cost of doing business.

The USDA is building up a proposed control for the formation of directions to cover rats, mice, and winged animals other than those reared for inquire about that will represent others conscious dealing with, care, treatment, and transportation, as commanded by the 2002 Farm Bill. Even though by far most of mice and rats are absolved from the meaning of “creature” under the law, the USDA evaluates no less than 5 million hostage winged animals will covered up noticeably secured by this new direction since they were not particularly reproduced for research.

In India aspect of law the removal of animal tests from the cosmetics testing standards by the PCD 19 Cosmetics Sectional Committee of the Bureau of Indian Standards (BIS) last year, the Ministry of Health & Family Welfare has now published the **cosmetic testing ban**, which *add* the new rule **”148-C. prohibition of testing of cosmetics on animals – No person shall use any animal for testing of cosmetics”** to the existing Drugs and Cosmetics Rules, 1945. This marks a significant victory for animals in India, because while standards under the BIS can undergo change, this addition to the law means that any changes made can never include animal tests. And because the definition of

“cosmetics” under the Drugs and Cosmetics Rules, 1945, includes any article intended for use as a component of cosmetic, the ban on animal testing should apply to ingredients, too. The removal of animal tests from the standards and this progress follows an intense campaign by PETA India and work by MP Maneka Gandhi and others.

#### Conclusion

Overall, animal testing is expensive, time-consuming, unpredictable, and not easily reproducible from one lab to another (i.e., results lack reliability). Because of their expense, cumbersomeness, and scientific limitations, animal tests have not adequately addressed the vast number of chemicals already in commercial use, nor the estimated 700 new ones introduced every year. According to Dr. Thomas Hartung, director of the Johns Hopkins University Center for Alternatives to Animal Testing, out of “some 100,000 chemicals in consumer products, only about 5,000 have had significant testing so far because no one has the capacity for experiments using standard methods involving animals.” While all new products must be tested for safety, using animals to assess human health risks is inefficient, unreliable, and has limited—if any—predictive value for what will happen in humans.

Thankfully, private industry and a growing number of federal agencies are now acknowledging the superiority of alternative methods for safety testing. While alternative methods have not received the full scientific, industry, and government support that they deserve, progress is being made, as the development of alternative techniques becomes more widely recognized as a legitimate and important area of basic and applied scientific investigation.

For example, one traditional criticism of *in vitro* replacement alternatives was their inability to mimic or reproduce the consequences of long-term, chronic human exposure to toxic substances. This is no longer the case. As cell culture technology has evolved, it is now possible to maintain *in vitro* systems for sufficiently longer periods of



time—weeks or months. It is not necessary to maintain such cultures for years, as is done with some typical chronic animal tests. Long-term cell and tissue culture techniques can now allow *in vitro* studies of the effects of chronic, repeated exposure to toxic substances, as well as the recovery from such exposure in a shorter period of time.

Non-animal methods involving *in vitro* research, computer modeling, virtual drug trials, microdosing technologies, and human cell and tissue methods including human skin models and “human-on-a-chip” technology are superior on all fronts: they are more efficient, accurate, and cost-effective than the cruel animal experiments they replace.

Finally, laws regarding this are not as strong as they ought to be, especially in India, so if they are made strict and strictly followed (that is completely on us), then the day is not so far when humanitarian values will reach to a point where this cruelty on animals will be disappeared and it will be only due to the fact that we have realized that pain and now we do something for these animals which are with us since from the evolution of mankind.

*“If you want to test cosmetics, why do it on some poor animal who hasn’t done anything? They should use prisoners who have been convicted of murder or rape instead. So, rather than seeing if perfume irritates a bunny rabbit’s eyes, they should throw it in Charles Manson’s eyes and ask him if it hurts.”*

*Æ Ellen DeGeneres, My Point... And I Do Have One*

*“We need, in a special way, to work twice as hard to help people understand that the animals are fellow creatures, that we must protect them and love them as we love ourselves.”*

*Æ César Chñvez*