ELIMINATING THE USE OF ANIMAL TESTING FOR COSMETICS AND OTHER PRODUCTS

COMPILED BY HOWIE BAUM

ANIMAL TESTING

Animal testing is the use of non-human animals in experiments that seek to control the variables that affect the behavior or biological system under study.

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.

The focus of animal testing varies from focusing on:

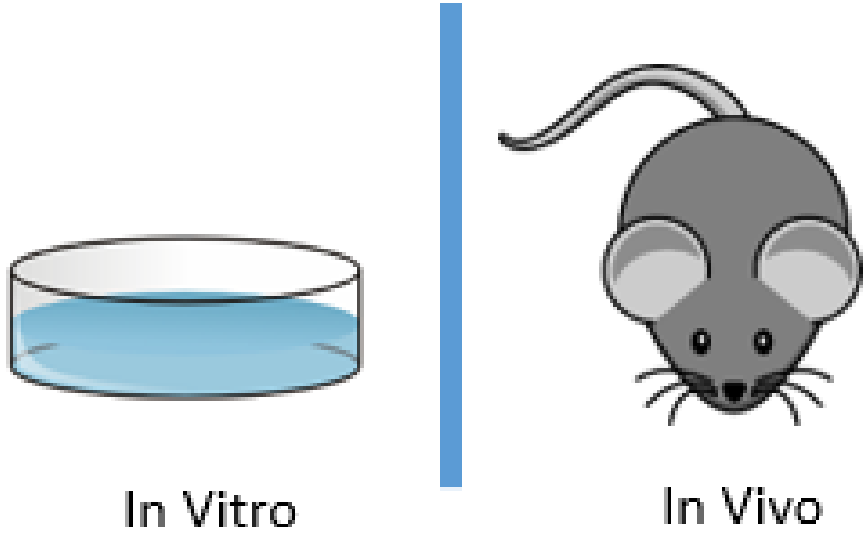
1) Developing fundamental knowledge of an organism

2) To applied research, which may focus on finding a cure for a disease or observing a reaction to a chemical or cosmetic material.

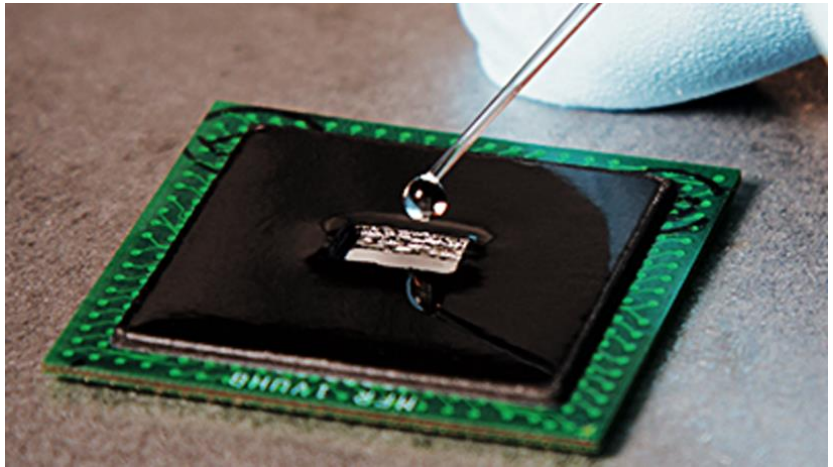
DEFINITIONS OF WORDS THAT ARE USED IN THE PRESENTATION

The term **in vivo** refers to a medical test, experiment or procedure that is done on (or in) **a living organism**, such as a laboratory animal or human.

The term **in vitro, in contrast to in vivo**, refers to a medical study or experiment which is done in the laboratory within the confines of **a test tube or laboratory dish.**



In silico (Pseudo-Latin for "in silicon", alluding to the large use of silicon for computer chips) is an expression meaning "**performed on computer or via computer simulation", in reference to biological experiments**.

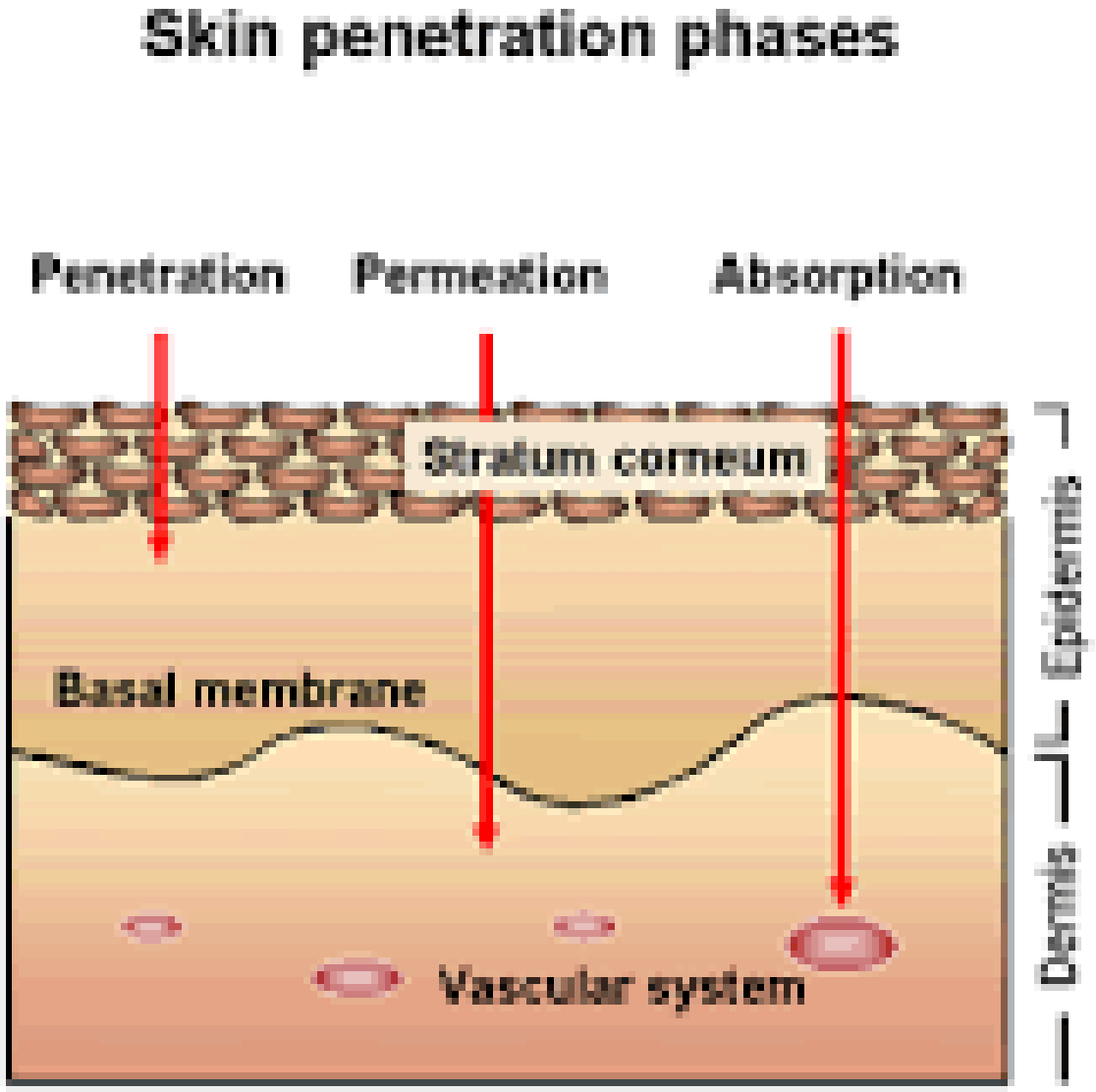


WHAT KINDS OF ANIMAL TESTING ARE DONE ?

Methods of testing cosmetics on animals include many different tests that are categorized differently based on which areas the cosmetics will be used for.

Dermal penetration: It is a method that creates a better understanding of skin absorption of a chemical into the bloodstream, usually using rats for the testing.

Skin sensitization: This is a method that determines if a chemical causes an allergic reaction on an animal's skin.



Acute toxicity: This test is used to determine danger of exposure to a chemical by mouth, skin, or inflammation, and has been done on rats and mice.

Draize test:

This is a method of testing that may cause irritation or corrosion to the skin or eye on animals, dermal sensitization, airway sensitization, or endocrine disruption.

Skin corrosivity or irritation:

This method of test assesses the potential of a substance causing irreversible damage to the skin, usually using rabbits.

Animal research plays a vital role in the development of modern medical and veterinary treatments.

Much of our understanding about the biological processes in the body, and the diseases that affect them, comes from studies in animals.

Most companies and organizations believe that animal research should be conducted with the utmost care, responsibility and respect towards the animals and follow the pertinent guidelines, regulations and laws.

The **Animal Welfare Act:**
The Animal Welfare Act, or AWA, is a federal law that addresses the standard of care animals receive at research facilities.

The **Public Health Service:**
The Public Health Service, or PHS, oversees the two federal agencies doing the most testing on animals: the Food and Drug Administration (the FDA), and the Centers for Disease Control and Prevention (the CDC).

The United States Department of Agriculture (USDA):
The United States Department of Agriculture, or USDA, is the federal agency responsible for overseeing and inspecting laboratories that experiment on animals, as well as those who breed and sell animals for use in laboratories.

Other Regulatory Bodies:
The Association for Assessment and Accreditation of Laboratory Animal Care
It is a private, nonprofit accreditation organization aimed at improving humane care for laboratory animals

Institutions that experiment on covered animals are also required under federal regulations to convene an Institutional Animal Care and Use Committee, which self-regulates experiments at their institutions .

Nearly 40 countries, including the member states of the European Union, Australia, Guatemala, India, Israel, New Zealand, Norway, South Korea, Switzerland, Taiwan and Turkey, all have existing laws prohibiting or limiting cosmetic animal testing.

Beauty conglomerates such as Unilever, Procter & Gamble, Avon and the Estée Lauder Companies already have already committed to ending animal testing by endorsing campaigns such as **#BeCrueltyFree campaign** that strive to **ban animal testing for cosmetics in all major global beauty markets by 2023**.

3 MAJOR STATES BANNED ANIMAL TESTING IN COSMETICS

In a landmark move, three major states – as of January, 2020, **California, Nevada and Illinois** have all banned the sales of cosmetics newly tested on animals.

The Humane Cosmetics Act, once implemented nationwide, will end all animal testing for cosmetic products and ingredients in the U.S. and prohibit the import of cosmetics that have been tested on animals anywhere else in the world.

The bill also prohibits companies from labeling products as cruelty-free if they are selling in China where animal-testing is still required.

ANIMAL TESTING ALTERNATIVES ACCEPTED BY NEW EPA POLICY

In April of 2018, the U.S. Environmental Protection Agency announced that it began accepting alternatives to animal testing for detecting the skin sensitization—or allergenic—potential of chemicals and pesticides

Many chemicals from bug sprays to cleaning products to industrial solvents, are required to be tested on mice or, less often, guinea pigs, in tests that cause the animals to develop painful, red, irritating reactions.

Scientists have developed several advanced in vitro methods that are more accurate than the animal tests, and so are more protective of workers, consumers, and others who come into contact with chemicals.

https://www.youtube.com/watch?v=zEcNSFDPNiI&feature=emb_logo 1.6 minutes

THE FDA – U S FOOD AND DRUG ADMINISTRATION

The FDA is responsible for assuring that cosmetics are safe and properly labeled but they don't need FDA premarket approval.

This mission is accomplished through enforcement of the Federal Food, Drug, and Cosmetic Act (FD&C Act), related statutes, and regulations promulgated under these laws.

However, the agency has consistently advised cosmetic manufacturers to employ whatever testing is appropriate and effective for substantiating the safety of their products.

It remains the responsibility of the manufacturer to substantiate the safety of both ingredients and finished cosmetic products prior to marketing.

The FDA supports and adheres to the provisions of applicable laws, regulations, and policies governing animal testing, including:

The Animal Welfare Act

The Public Health Service Policy of Humane Care and Use of Laboratory Animals.

In all cases where animal testing is used, the FDA advocates that research and testing **derive the maximum amount of useful scientific information from the minimum number of animals and employ the most humane methods available within the limits of scientific capability.**

- **Ethical Treatment of Animal Subjects**

- **THE ROLE OF THE INSTITUTIONAL REVIEW BOARD (IRB)**

UNIVERSITY OF Cincinnati

THE UNIVERSITY OF CINCINNATI INSTITUTIONAL REVIEW BOARD (IRB)

The University of Cincinnati (UC) Animal Care and Use Program (ACUP) encompasses Laboratory Animal Medical Services (LAMS, the animal facilities) and the Institutional Animal Care and Use Committee (IACUC) office.

We are committed to facilitating research and education while **providing the highest quality animal care**. Our program is fully AAALAC accredited and you can view our last USDA inspection report here.

Animal Care and Use Program

513-558-5171
lams@ucmail.uc.edu
Staff

The University of Cincinnati Animal Care and Use Program is responsible for the regulatory and veterinary oversight of all research activities that involve animals within the institution

Allowed/Recommended Standard Environmental Enrichment

SPECIES	EXAMPLES OF ALLOWED/RECOMMENDED ENVIRONMENTAL ENRICHMENT
Amphibian	• Plastic hiding hut/tube/etc. • Floating ping pong balls, Plastic lily pads • Flowing water
Bird	• Perch and Mirror • Foraging and nesting materials • Nest box
Cat	• Non-edible toy • Resting board, Scratching post, Hide box, bedding and cushion • Auditory - Soft radio music • Food treats
Dog	• Non-edible toy • Rubber mats, Plastic beds, Bedding and cushion • Auditory - Soft radio music • Food treats
Fish	• Aquarium substrate (Marbles, gravel) • Barriers, hides, shelters, aquatic plants (live or plastic) • Flowing water (raceways, continuous flow tanks)
Gerbil	• Non-edible toy • Disposable hut • Nesting material (crinkle paper) • Dust bath
Guinea Pig	• Non-edible toy • Plastic hut/tube/etc. • Nesting material (crinkle paper) • Dietary – Fresh vegetables, lettuce, timothy or alfalfa hay (autoclaved)
Mouse	• Non-edible toy • Plastic or disposable huts/tunnel • Nesting material (Nestlets, crinkle paper)/Bedding enrichment mix
Pig	• Non-edible toy (stainless steel rattle, ball, dumb bell, plastic chains), Mirror • Music (soft) • Food treats – fresh vegetables, fruits, yogurt, marshmallow, Twinkies etc.
Rabbit	• Non-edible toy (stainless steel rattle, ball, dumb bell) • Plastic tunnel • Dietary – Fresh fruits or vegetables, timothy or alfalfa hay (autoclaved)
Rat	• Non-edible toy • Disposable hut • Nesting material (crinkle paper)
Reptile	• Plastic hut/tube/etc. • Natural tree branches

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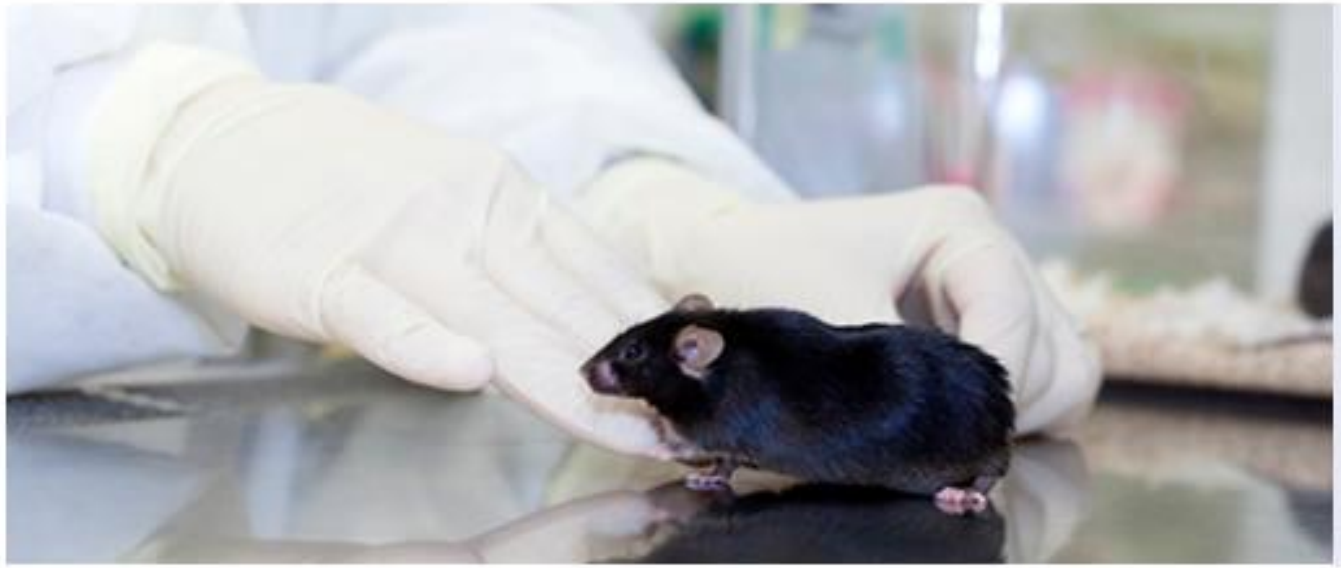
VA Animal Research Program



Animal research has saved the lives of millions of Veterans, and will continue to do so.

Overview of Animal Research in VA

COSMETIC TESTING ON ANIMALS

Cosmetic testing on animals is used to test the safety and hypo-allergenic properties of products for use by humans.

Due to the harm done to the animal subjects, this testing is opposed by animal rights activists and others.

Cosmetic animal testing is banned in Colombia, the European Union, United Kingdom, India, Israel, and Norway.

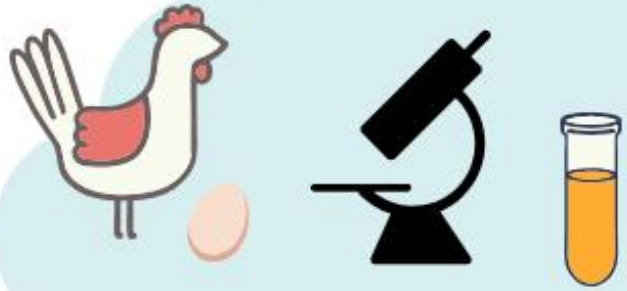
It may involve testing either a **finished product or the individual ingredients** of a finished product on animals, often rabbits, as well as mice, rats, and other animals.

Chemicals and substances such as personal care products, cosmetics, cleaning supplies, and pesticides are tested to determine if they present eye and skin injury hazards and to classify them for appropriate labeling and packaging

Cosmetics can be defined as products applied to the body in various ways in order to enhance the body's appearance or to cleanse the body.

This includes all hair products, makeup, nail products and soaps.

ANIMAL RESEARCH THROUGHOUT TIME



200BC & 400BC

Greek physician-scientists Aristotle & Erasistratus were among the first to perform experiments on living animals

200AD

Roman physician Galen dissected goats & pigs also known as the "father of vivisection"

1100'S

Avenzoar, an Arab physician introduced animal testing as an experimental method for testing surgical procedures before applying them to humans

humans

1880'S

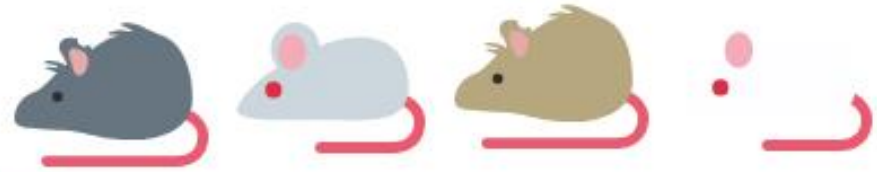
Louis Pasteur demonstrated the germ theory of medicine by inducing anthrax in sheep

1898

Sir Ronald Ross discovered the Malaria-parasite's life-cycle in birds

1902

The first genetics study was carried out in mice to demonstrate the pigment (Melanin) coding gene



1922

Frederick Banting and his collaborator isolated insulin from dogs, which revolutionised the treatment of diabetes

1937

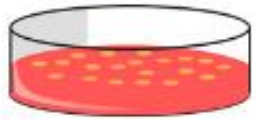
Purified beef liver and lung extracts of heparin anticoagulant was tested in dogs, rabbits, guinea pigs, mice and subsequently in humans

1950'S

The Salk and Sabin polio vaccines were discovered after an extensive research using monkeys, rats and mice

1970'S

Antibiotic treatments and vaccines for leprosy were developed using armadillos



1980'S

The efficacy of azidothymidine, the first approved drug treatment for HIV and AIDS was tested in dogs, mice, primates and rats

2000'S

Advancements in sequencing technology opened up the field of reverse genetics leading to genetic modification of animals

PRESENT

Animal research is still common practice. However, new alternatives are being investigated

BIOLOGICAL SIMILARITY OF HUMANS AND OTHER ANIMALS

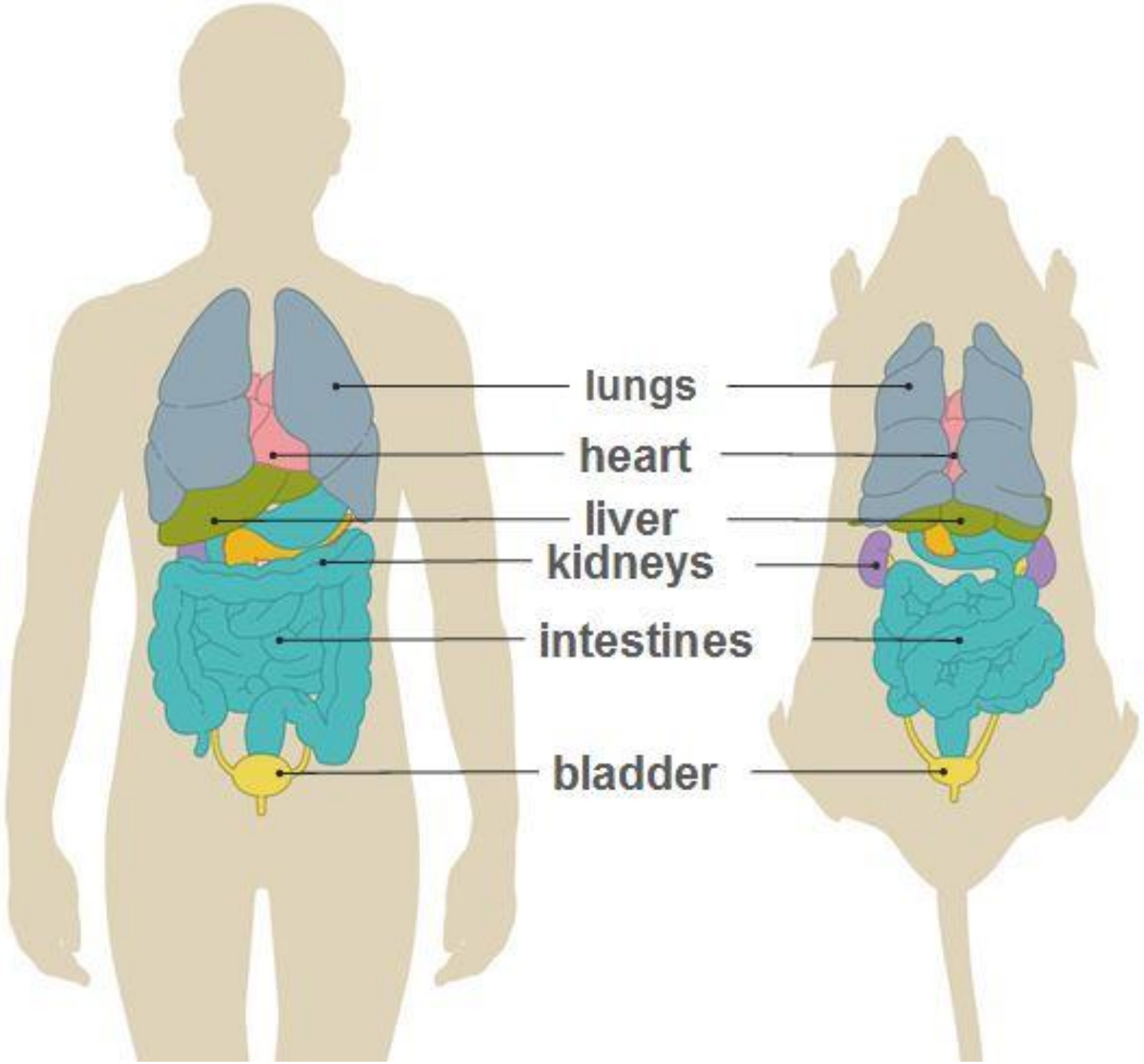
Although humans and animals (technically "non-human animals") may look different, at a physiological and anatomical level they are remarkably similar.

- **Animals, from mice to monkeys, have the same organs (heart, lungs, brain etc.) and organ systems (respiratory, cardiovascular, nervous systems etc.) which perform the same functions in pretty much the same way.**

- The similarity means that nearly 90% of the veterinary medicines that are used to treat animals are the same as, or very similar to, those developed to treat human patients.

- **There are minor differences, but these are far outweighed by the similarities.**

- **The differences can give important clues about diseases and how they might be treated – for instance, if we knew why the mouse with muscular dystrophy suffers less muscle wasting than human patients, this might lead to a treatment for this debilitating and fatal disorder.**



We share approximately 99% of our DNA with mice, and we can use "knockout" mice to work out what effect individual human genes have in our body.

We do this by "turning off" one of the genes in a mouse, common to a human, and seeing what effect this has on the mouse.

By recreating human genetic diseases in this way we can begin to look for treatments.

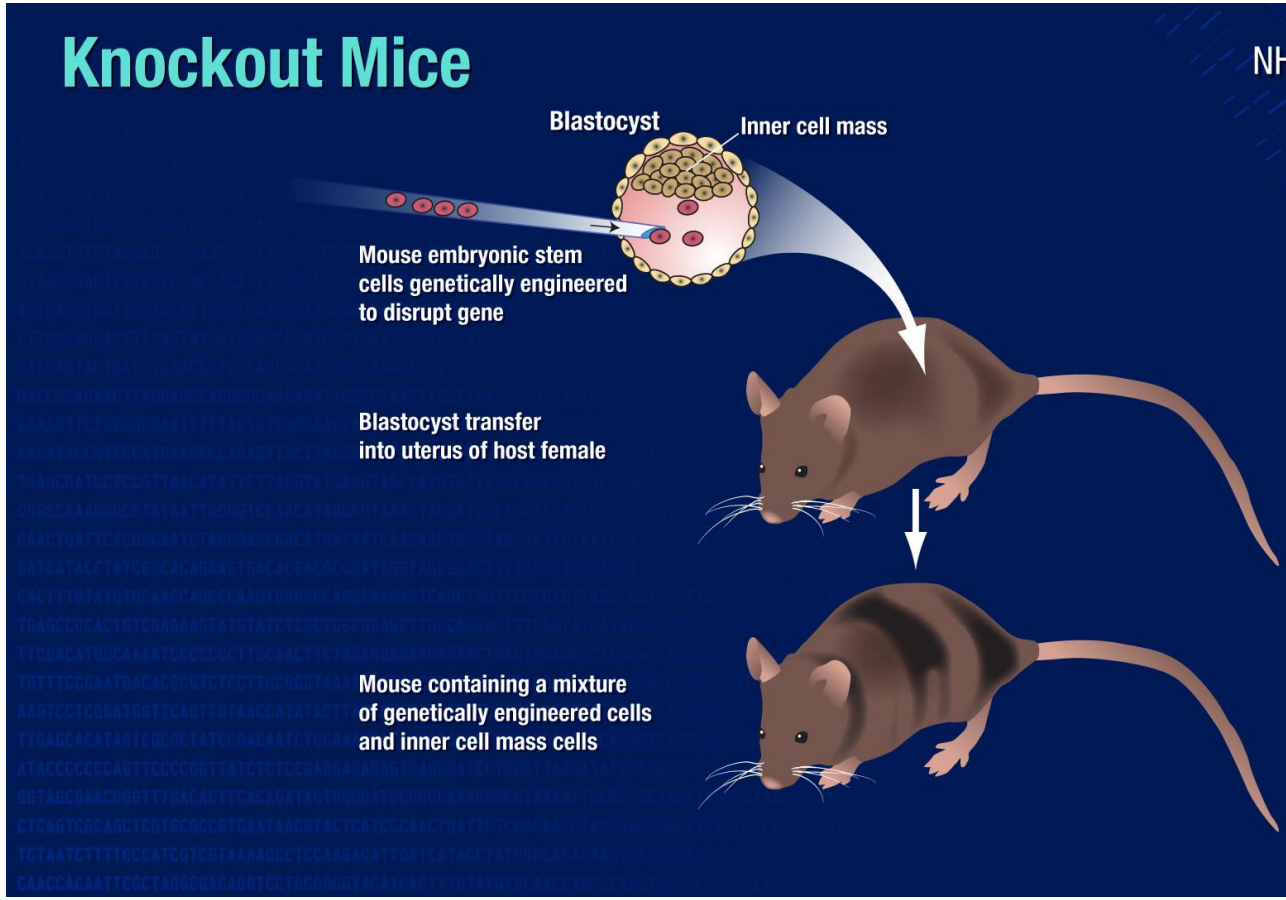
KNOCKOUT MICE

A knockout mouse is a laboratory mouse in which researchers have inactivated, or "knocked out," an existing gene by replacing it or disrupting it with an artificial piece of DNA which provides valuable clues about what that gene normally does.

Humans share many genes with mice. On average, the protein-coding regions of the **mouse** and **human** genomes **are** 85 percent identical and some **genes are** 99 percent identical.

So observing the characteristics of knockout mice gives researchers information that can be used to better understand how a similar gene may cause or contribute to disease in humans.

These mice have been useful include studying and modeling different kinds of **cancer, obesity, heart disease, diabetes, arthritis, substance abuse, anxiety, aging and Parkinson disease**.



Laboratory Mouse

Education

Caltech, Oxford, Stanford, Harvard, MIT, Princeton, Cambridge, Imperial, Berkeley, Chicago, Yale, ETH Zurich, Columbia, UPenn, John Hopkins, UCL, Cornell, Northwestern, UMichigan, Toronto, Carniege Mellon, Duke, UWashington, UTexas at Austin, GA Tech, Tokyo, Melbourne, Singapore, UBC, Wisconsin-Madison, Edinburgh, McGill, Hong Kong, Santa Barbara, Karolinska Institute, UMinnesota, Manchester ... and just about every other major university, medical school & research institution in the world.

Nobel Prizes

1905 - Transmission and treatment of TB
1906 - Structure of Nervous System
1907 - Role of protozoa in disease
1908 - Immunity to infectious diseases
1928 - Investigations on typhus
1929 - Importance of dietary vitamins
1939 - Discovery of antibacterial agent, Prontosil
1945 - Discovery of penicillin
1951 - Yellow fever vaccine
1952 - Discovery of streptomycin
1954 - Culture of the polio virus
1960 - Understanding of immunity
1970 - Understanding of neurotransmitters
1974 - Structural & functional organisation of cells
1975 - Tumour-viruses and genetics of cells
1977 - Hypothalamic hormones
1984 - Techniques of monoclonal antibody formation
1986 - Nerve growth factor and epidermal growth factor
1990 - Organ transplantation techniques
1992 - Regulatory mechanisms in cells
1996 - Immune-system detection of virus-infected cells
1997 - Discovery and characterisations of prions
1999 - Discovery of signal peptides
2000 - Signal transduction in the nervous system
2004 – Odour receptors and organisation of olfactory systems
2008 - Role of HPV and HIV in causing disease
2010 - Development of in vitro fertilization
2011 - Discoveries around innate and adaptive immunity
2012 - Reprogramming mature cells to pluripotent ones

Overview

- Involved in around 75% of research
- Short life-span and fast reproductive rate means mice are suitable for studying disease across whole life cycle
- 98% of genes have comparable genes in humans
- Similar reproductive and nervous systems and suffer many of the same diseases as humans including cancer diabetes and anxiety
- Can be genetically modified to include human genes in enhance biological relevance
- Can act as an avatar for a human cancer to allow drug therapies to be trialled safely

Research Areas

Alzheimer's disease, anaesthetics, AIDS & HIV, anticoagulants, antidepressants, asthma, blindness, bone and joint disease, brain injury, breast cancer, cardiac arrest, cystic fibrosis, deafness/hearing loss, Down's sndrome, drugs for high blood pressure, transplant rejection, Hepatitis B, C & E, Huntington's disease, influenza, leukaemia, malaria, motor neurone disease, multiple sclerosis, muscular dystrophy, Parkinson's disease, prostate cancer, schistomiasis, spinal cord injury, stroke, testicular cancer, tuberculosis,

CV of a Lifesaver

Contact

www.understandinganimalresearch.org.uk
www.animalresearch.info
www.amprogress.org
www.speakingofresearch.com

NOBEL PRIZES AND ANIMAL RESEARCH

For just over a century the Nobel prize has been awarded each year in recognition of the world's greatest medical advances.

Of the 108 Nobel Prizes awarded for Physiology or Medicine, 96 were directly dependent on animal research.

Animal research underpinned the very first Nobel Prize to be awarded for Physiology or Medicine to Emil von Behring in 1901 for developing serum therapy against diphtheria, as it did the most recent one awarded in 2016.

The PETA organization (People for the Ethical Treatment of Animals) say that **these Beauty Brands Are Still Tested on Animals, in China.**

For a long list of companies that PETA says that do animal testing on their products, go to https://crueltyfree.peta.org/companies-dont-test/

Companies that

TEST ON ANIMALS

MAYBELLINE NEW YORK
Lysol
Aveeno ACTIVE NATURALS
ALMAY SIMPLY AMERICAN
Caress
Kiehl's SINCE 1851
ChapStick
VICKS
Aquafresh
glade
ARM & HAMMER
stila
REVLON
CLOROX
Windex
Tide
L'ORÉAL
ESTĒE LAUDER
MARY KAY
COVERGIRL
St. Ives
Febreze
Clean & Clear
Old Spice
Johnson & Johnson
Dove
Vaseline
Secret
Coppertone
Comet
MAC
LISTERINE
TRESemmé professional affordable
PANTENE PRO-V
Pampers
head & shoulders
AVON the company for women
BOBBI BROWN

PETA

THESE COMPANIES TEST ON ANIMALS

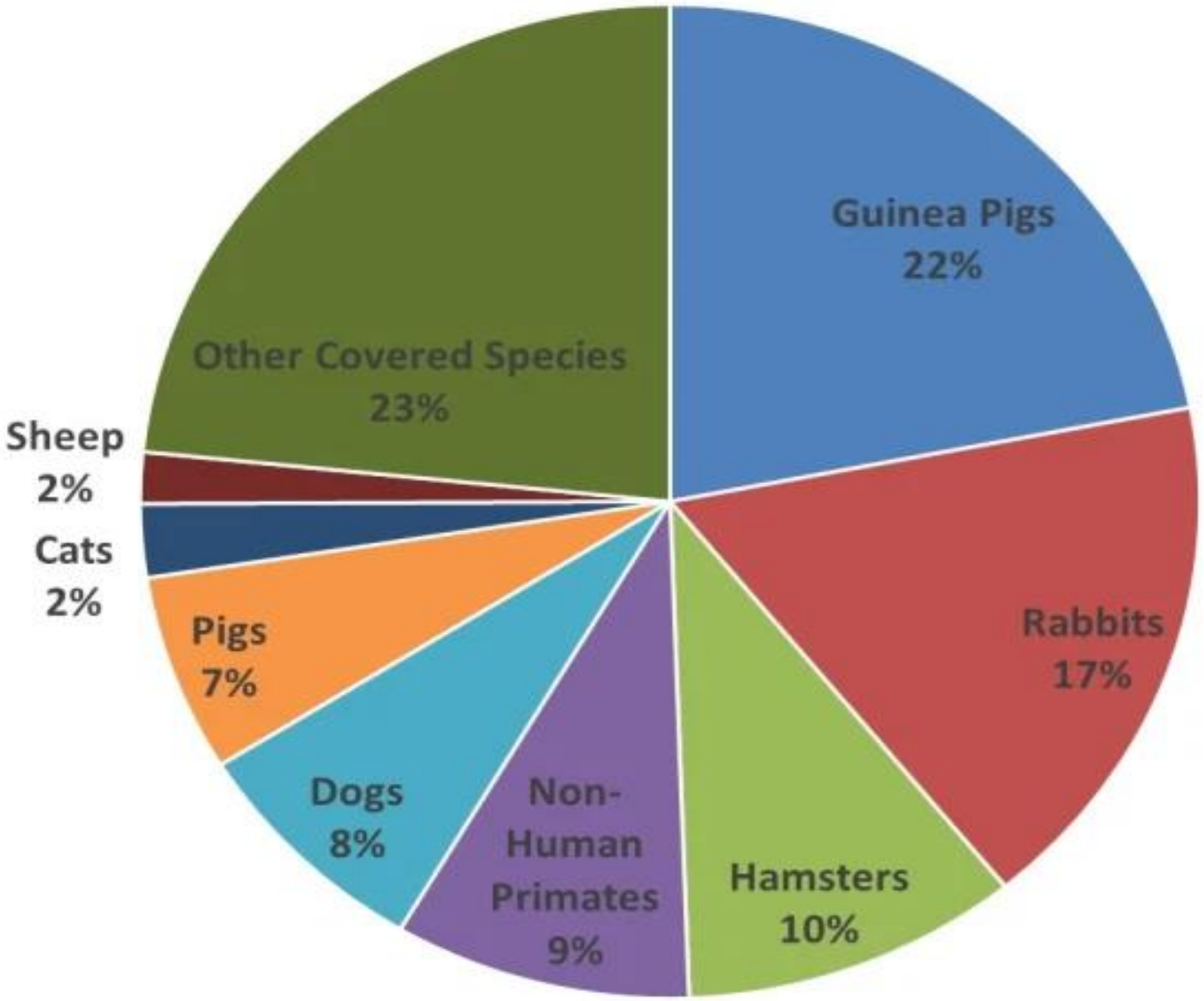
3M
409
ARM & HAMMER
Aquafresh
NIVEA
ARMOR ALL
AIR WICK
ACUVUE
Aveeno ACTIVE NATURALS
PURINA
ALMAY
AXE
AVON
BOBBI BROWN
BiC
Comet
Clean & Clear
Coppertone
MAYBELLINE NEW YORK
Caress
BOSS HUGO BOSS
BAND-AID
Colgate
CLOROX
ChapStick
COVERGIRL
DRY IDEA
Downy
Dove
Drano
Mr. Clean
Crest
DIESEL
Gillette
IAMS
GLAD
Kiehl's SINCE 1851
GARNIER
green works
Elizabeth Arden
ESTĒE LAUDER COMPANIES
glade
head & shoulders
Dial
Johnson & Johnson
Lysol
IVORY
MARY KAY
LISTERINE

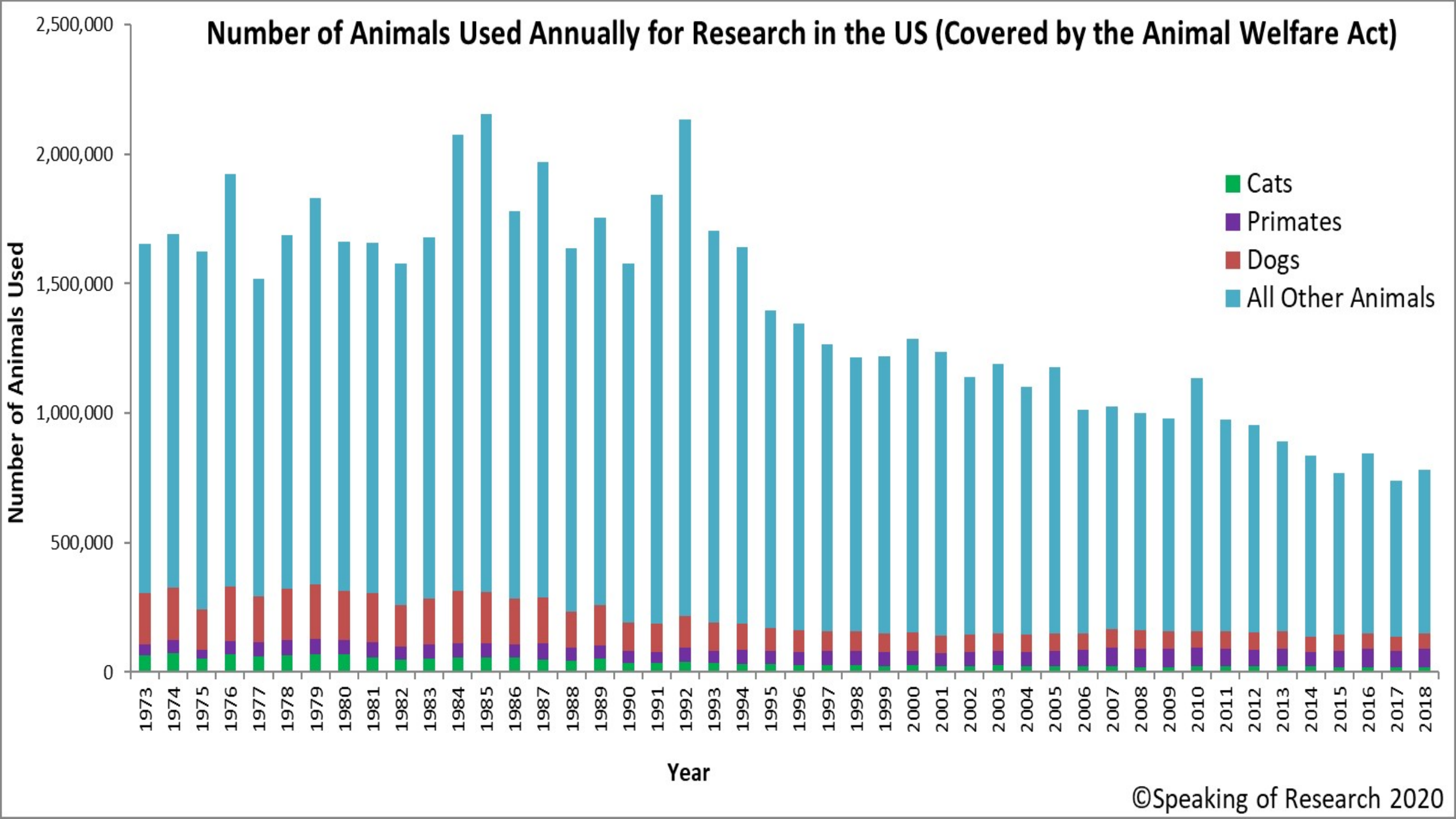

AXE
Dove
Slim-Fast
HB
Vaseline
BERTOLLI
Suave
SUNSILK
HELLMANN'S
Unilever
BEN & JERRY'S
POND'S
veganrabbit.com


K-Y BRAND
Lubriderm
Benadryl
nicorette
Stayfree
Clean & Clear
Neutrogena
PURPOSE
ACUVUE
VIACTIV
Johnson & Johnson
Purell
BENGAY
AMBI
Rogaine
REACH
Splenda
Daktarin
Aveeno
ACTIVE NATURALS
SUDAFED
Prim'age
TYLENOL
NEOSPORIN
REMBRANDT
ORAL HEALTH AND BEAUTY
ZYRTEC
Lactaid
Carefree
Caladryl
MONISTAT
SHOWER & SHOWER
Benecol
VENDOME
RoC
Imodium
Pepcid
Rolaids
o.b.
Visine
Motrin
Mylanta
Desitin
LISTERINE
BAND-AID
veganrabbit.com

The PETA organization (People for the Ethical Treatment of Animals) say that these Companies don't do testing of Makeup on animals.

Number of Animals used in research in the US in 2018 by Species




Number of Animals Used Annually for Research in the US (Covered by the Animal Welfare Act)
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Number of Animals Used
Cats
Primates
Dogs
All Other Animals
1973
1974
1975
1976
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Year
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Number of Procedures by Species

2.6 M

Mice

514,340

Fish

177,904

Rats

148,047

Birds

53,672

Sheep

6,445

Guinea Pigs

11,159

Rabbits

9,873

Amphibians

CRUELTY-FREE Progress Around the World

Australia

Petitioning the government to introduce a national ban on cosmetics animal testing.

Brazil

São Paulo cosmetics animal testing ban in January 2014; national ban under discussion; national guidelines revised to increase acceptance of non-animal test methods.

Canada

Working with politicians to amend Canada's Food and Drugs Act to ban animal testing for cosmetics.

China

Regulations changed to end animal testing requirements for cosmetics manufactured in China (we're now working to extend this exemption to foreign imports as well).

India

National cosmetics animal testing ban in June 2013, and a sales ban is currently under development by the government.

Japan

Initiated a high-level dialogue with political, regulatory and corporate stakeholders toward a national testing ban.

New Zealand

Pressing for a cosmetics animal testing ban as part of ongoing revisions to New Zealand's Animal Welfare Act.

Russia

Government acceptance of non-animal test methods following a practical training course for regulators, co-funded by HSI.

South Korea

$155 million government commitment to build national alternative testing center; regulatory acceptance of non-animal test results for medicated cosmetics.

Taiwan

Working to educate politicians and the public on the importance of ending animal testing for cosmetics.

United States

Leading efforts to support federal legislation that will phase-out animal testing and prohibit the import of animal tested cosmetics.

1

Skin irritation

#TheRatList
Replace Animal Tests

RABBITS

Estimated number of tests in the European Union: 4,120

A test chemical substance is rubbed on to a 6centimeter (2.4 inch) area of a rabbit's shaved skin and held in place with a bandage for four hours.

The rabbit is then examined for signs of skin damage during a 14-day period.

Replacement method:

Reconstituted human skin models can be used in most cases. They are more predictive than the rabbit test.

2

Eye irritation

#TheRatList
Replace Animal Tests

RABBITS

Number of tests in the European Union: 814

A chemical test substance is placed in the eyes of live rabbits and left for at least one hour before being washed out.

Their eyes are then examined for signs of irritation and damage over three days.

Replacement method:

Reconstituted human eye models can be used to detect non-irritants. Eyes from hens and cows killed for food can also be used to identify severe irritants and non-irritants.

3

Skin sensitisation

#TheRatList
Replace Animal Tests

MICE AND GUINEA PIGS

Number of tests in the European Union: 47,341

A chemical test substance is rubbed on to the shaved skin of guinea pigs who are then observed daily for signs of an allergic reaction for almost a month.

Replacement method:

Several in vitro tests can be used in combination, 3 specialized chemical types, based on using human skin cells.

RABBITS

4

Pyrogenicity

#TheRatList
Replace Animal Tests

Number of tests in the European Union: 35,172

Product test is used for: Medicines

Pyrogens are substances that trigger a fever response when they make their way into our bodies.

The most common pyrogens are pieces of bacterial cells, and our immune systems recognize them as foreign matter.

Replacement method:

A test that uses human cells – the monocyte activation test (MAT) was developed in the 2000s.

The MAT test works by measuring the immune response by putting melted, previously frozen human blood, against the test substance.

5

Botulinum toxin test

#TheRatList
Replace Animal Tests

MICE

Number of tests in the European Union: about 400,000

Product test is used for: Medicines for human use.

Mice have an injection into their abdomens with the botulinum toxin and are checked over the next three days.

Replacement method:

The major toxin manufacturers have now developed a cell-based test to replace the batch test for their botox products.

MICE, RABBITS, SHEEP, GOATS

6

Antibody production

#TheRatList
Replace Animal Tests

Number of tests in the European Union: about 200,000 and is used to evaluate medicines for humans and those used by Veterinarians.

Animals are used as ‘factories’ to generate large numbers of antibodies.

The process involves injecting animals with a substance that stimulates the immune system to produce specific antibodies.

Replacement method:

Phage-display technology can be used to produce a wide range of antibodies that are of higher quality, more stable, more relevant, and more reproducible than the antibodies produced in animals.

They are also much faster and cheaper to produce.

HAMSTERS

7

Leptospira vaccine potency test

#TheRatList
Replace Animal Tests

Number of tests in the European Union: 3,826

Product test is used for evaluating medicines for humans and those used by Veterinarians

Hamsters are first injected with the vaccine and then, up to 30 days later, Leptospira bacteria is injected into their abdomens.

Replacement method:
Enzyme-linked immunosorbent assays (ELISAs) are rapid immunological tests that can be used to detect specific antigens or antibodies and to replace the potency test in hamsters.

These tests are more reliable and predictive than the hamster test.

MICE, FARM ANIMALS, DOGS, OR CATS

8

Veterinary vaccines batch test

#TheRatList
Replace Animal Tests

Number of tests in the European Union: about 5,000

Used to test medicines for veterinarian use

Animals are injected with two doses of an inactivated vaccine or ten doses of a live vaccine and then observed for at least two weeks.

Replacement method:

Improvements in the manufacturing process of vaccines have made animal batch tests redundant.

In vitro tests are also used as part of a ‘consistency approach’ to ensure that each vaccine batch is consistent to a previously tested batch.

MICE AND GUINEA PIGS

9

Abnormal toxicity

#TheRatList
Replace Animal Tests

Number of tests in the European Union: about 25,000

Product test is used to evaluate medicines for humans

Animals, typically mice, and guinea pigs, are injected with a biological product (e.g. vaccines, antibodies) and observed for signs of local and systemic reactions for at least seven days.

Replacement method:

Improvements in the manufacturing process of biological products and post-market surveillance have made animal batch tests redundant.

In vitro tests are used as part of a 'consistency approach' to ensure that each vaccine batch is similar i.e. consistent to a previously tested batch.

10

Shellfish toxins

#TheRatList
Replace Animal Tests

MICE

Number of tests in the European Union: 41,151

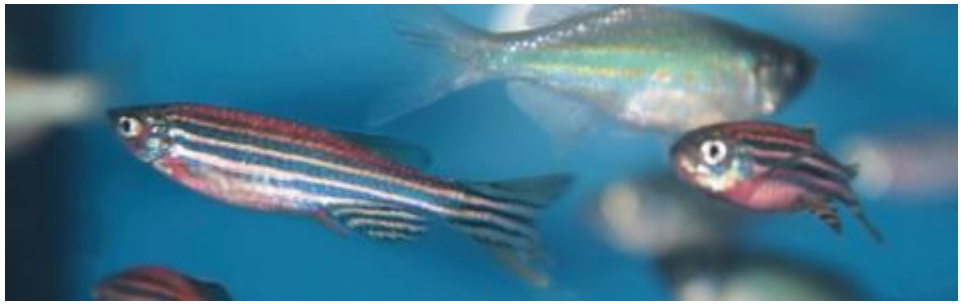
The product test is used for evaluating the safety of shellfish

Extracts from shellfish are injected into the stomachs of mice.

Replacement methods:

Analytical chemistry methods can be used to check for the presence of paralytic shellfish toxins (PSP), amnesic toxins (ASP) and lipophilic toxins (DSP).

OTHER LIVING ORGANISMS USED FOR ANIMAL TESTING



ANIMAL RESEARCH BY DISEASE

This is an index of research which has used animal models.

They are all live links so you can click on any you want to read more about.

- Addiction
- Arthritis
- Asthma
- Autoimmune Diseases
- Autism
- Comparative psychology, cognition, and behavior
- Blindness
- Cancers
- Chronic Pain
- Cystic Fibrosis
- Deafness
- Diabetes
- Down's Syndrome
- Ebola
- Genetic Diseases / Gene Therapy
- Genetic Modification
- Heart Disease
- Hepatitis
- HIV/AIDS
- Hospital bugs
- HPV
- In Vitro Fertilization
- Malaria
- Meningitis
- Multiple Sclerosis (MS)
- Muscular Dystrophy
- Neonatal and Prenatal Care
- Neurodegenerative Diseases (Alzheimer's / Parkinson's / Huntington's / ALS)
- Paralysis / Spinal Cord Damage
- Sepsis
- Stem cell treatment
- Stroke
- Tissue Engineering
- Transplant
- Tuberculosis (TB)
- Vaccines
- Veterinary Treatment
- Viral Respiratory Diseases / Flu
- Zika
- Other
- Nobel Prizes and other Awards

ANIMAL RESEARCH BY SPECIES

This page is an index of all our scientific posts describing research which has used animal models.

They are all live links, in case you want to read more about them.

- Amphibians and Reptiles
- Birds
- Cats
- Cattle
- Chimpanzees
- Dogs
- Ferrets
- Fish
- Fruit Flies
- Gerbils
- Goats
- GuineaPigs
- Horses
- Jellyfish
- Mice
- Monkeys
- Nematode Worms
- Pigs
- Rabbits
- Rats
- Sheep
- Other Invertebrates

MEDICAL BENEFITS

Animal Research has brought about many medical benefits

"Americans are living longer, healthier lives and we owe much of that success to biomedical research," said Robert Palazzo, Ph.D, President of the Federation of American Societies for Experimental Biology (FASEB)

The list to the right are a small selection of the major medical breakthroughs made possible by animal research.

These treatments have been used to save or improve the lives of many millions of people worldwide.

Penicillin

Blood transfusion

Tuberculosis

Macular degeneration

Asthma

Meningitis

Kidney Transplants

Breast cancer

Parkinson's disease

Insulin

The 3 “R”s

Modern non-animal techniques are already reducing and superseding experiments on animals.

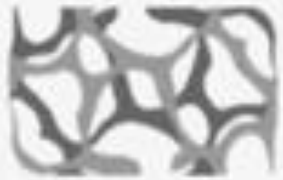
In the European Union, and other countries, the “3Rs” principle of animal experiments is a legal requirement.

It was developed over 50 years ago providing a framework for performing more humane **animal research**.

https://www.youtube.com/watch?v=2hxUMpYFo_Y&t=87s
3.3 minutes

In vitro 3-D Skin Model

Freeze-Drying



3-D Printing

Electrospinning

Skin-on-Chip

Keratinocyte
Melanocyte

Fibroblast

Models for Penetration and Safety Evaluation

Models for Skin Disease

Model for Basic Research in Clinical Use

ARTIFICIAL SKIN MATERIALS

EpiSkin™, EpiDerm™, and SkinEthic are each composed of artificial human skin as an option for alternative testing.

Artificial skin can imitate the reaction actual human skin will have to a product and the chemicals it contains and can be altered to mimic different skin types and ages.

For example, using UV light on EpiSkin can cause it to resemble older skin and adding melanocytes will turn the skin a darker color.

This helped create a spectrum of different skin colors that are then used to compare the results of sunblock on a different variety of people

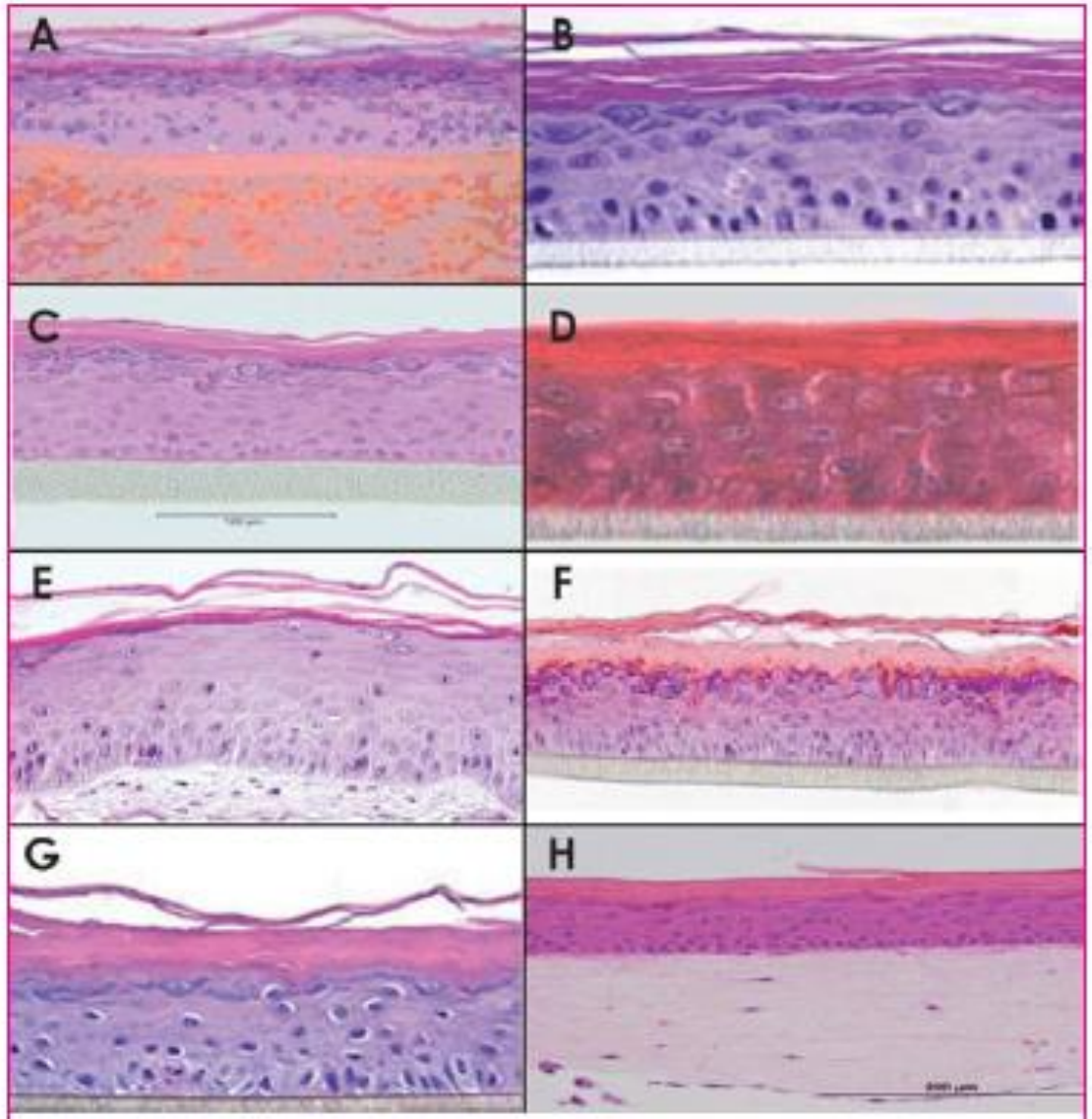
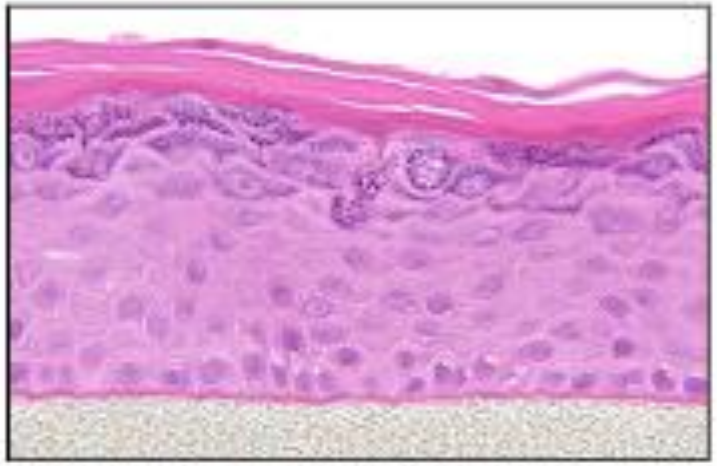
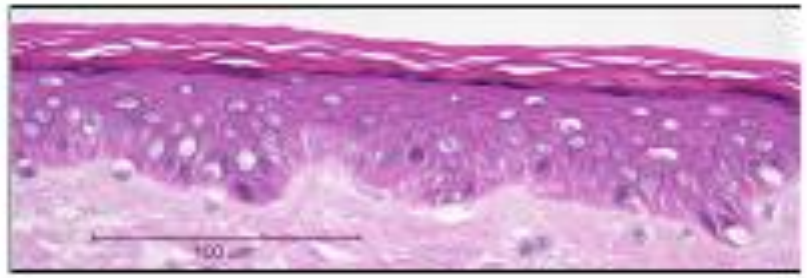


Figure 1. Examples of histological cross sections (Hematoxylin-Eosin staining) of 3D in vitro reconstructed skin models: EpiSkin (A), SkinEthic RHE (B), EpiDerm (C), EST1000 (D), Phenion®FT (E), OS-Rep (F), Straticell (G), StrataTest (H) and Sterlab (I) (Magnification not available)

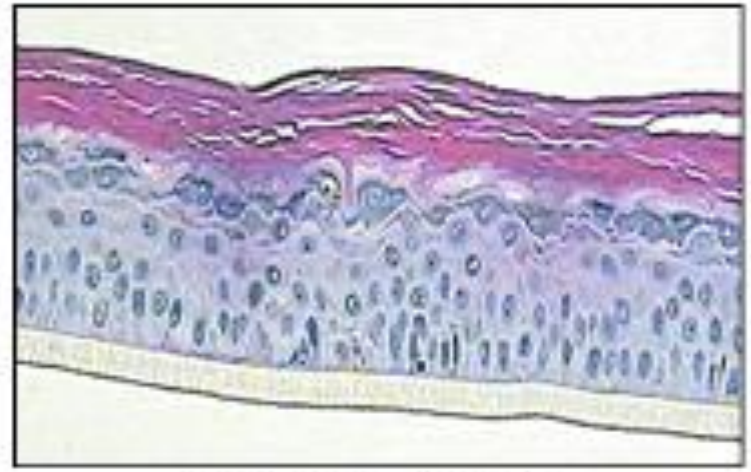
In Vitro Reconstructed Human Epidermis (RHE) Models Validated for Regulatory Purposes



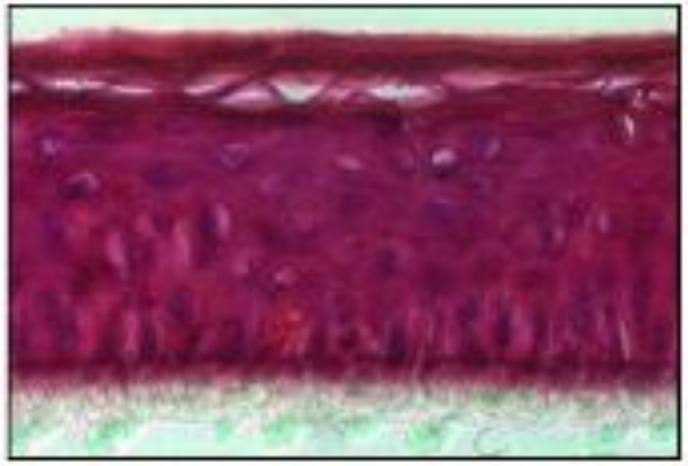
MatTek Corp. EpiDerm™ (EPI-200)



Native human skin

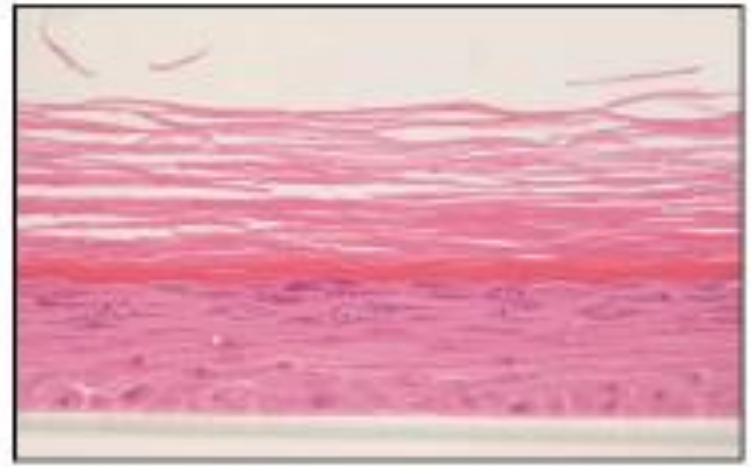


SkinEthic™ RHE



Cell Systems epiCS®

EpiSkin™ (SM)



J-TEC LabCyte EPI-MODEL

ALTERNATIVES TO ANIMAL TESTING

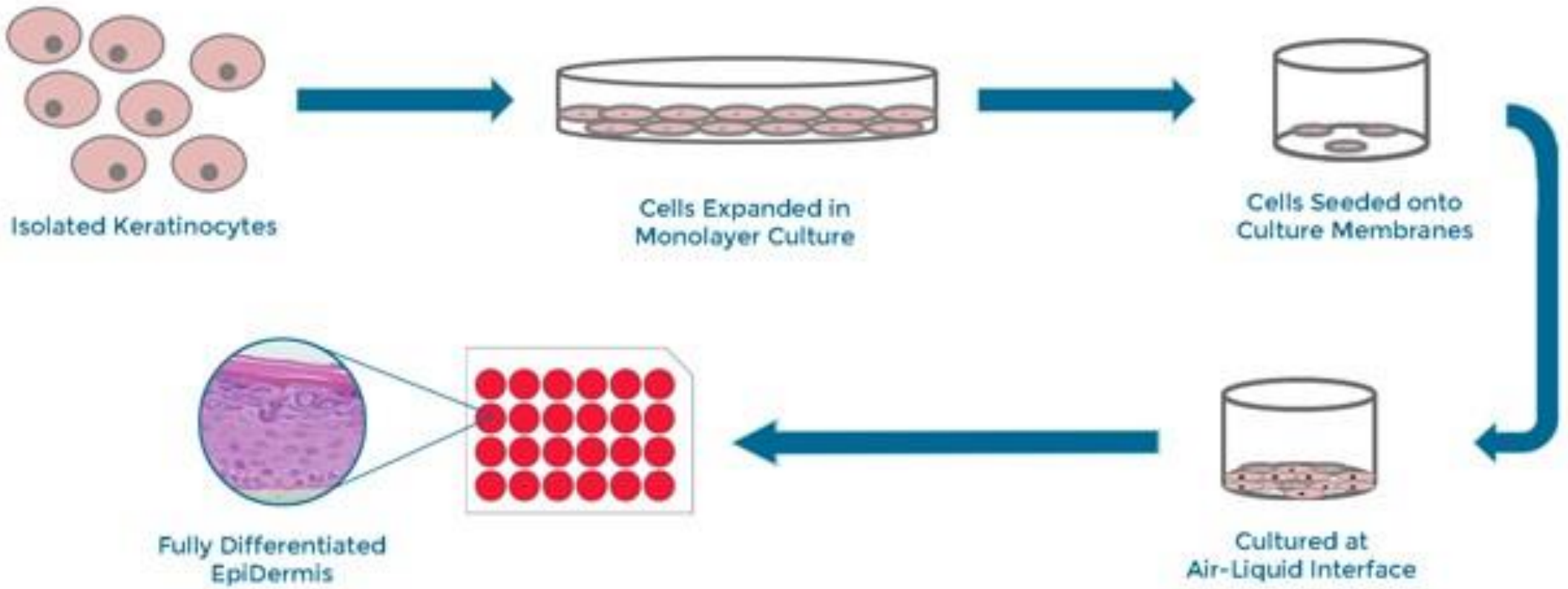
1) The CeeTox company was recently purchased by the Cyprotex Company and uses in-vitro (test tube) toxicity screening to test drugs, chemicals, cosmetics, and consumer products, instead of any animal testing.

They developed a method to assess the potential of a substance to cause a skin 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 tests in which experimenters injected guinea pigs or mice with a substance or applied it to their shaved skin to determine an allergic response.

Also known generically as a Reconstructed Human Epidermis (RHE), EpiDerm is a ready-to-use, highly differentiated 3D tissue model consisting of normal, human-derived skin cells, cultured on specially prepared tissue culture inserts.

EpiDerm


Isolated Keratinocytes
Cells Expanded in Monolayer Culture
Cells Seeded onto Culture Membranes
Cultured at Air-Liquid Interface
Fully Differentiated EpiDermis

2) MACHINE MADE BY THE VITROCELL CO.

Devices made by German-based manufacturer VITROCELL are used to expose human lung cells in a dish to chemicals in order to test the health effects of inhaled substances.

Using the VITROCELL machines, human cells are exposed to the airborne chemical on one side while receiving nutrients from a blood-like liquid on the other, mimicking what actually occurs when a chemical enters a human lung.

3) USING ARTIFICIAL INTELLIGENCE TO CHECK UP TO 5,000 SAFE INGREDENTS THAT HAVE ALREADY BEEN TESTED

By using safe ingredients from a list that are in computer databases and have already been tested, in conjunction with modern methods of cosmetics testing, the need for tests on them, using animals are not needed.

As part of this process, **Artificial Intelligence (AI)** can beat Animal Testing, at Finding Toxic Chemicals Machine learning could be the key to reducing the use of animals in experiments.

4) EPISKIN

They are the world leader in tissue engineering, offering Human Reconstructed Tissues, using a unique cell culture process, for the global scientific community.

Their product lines include:

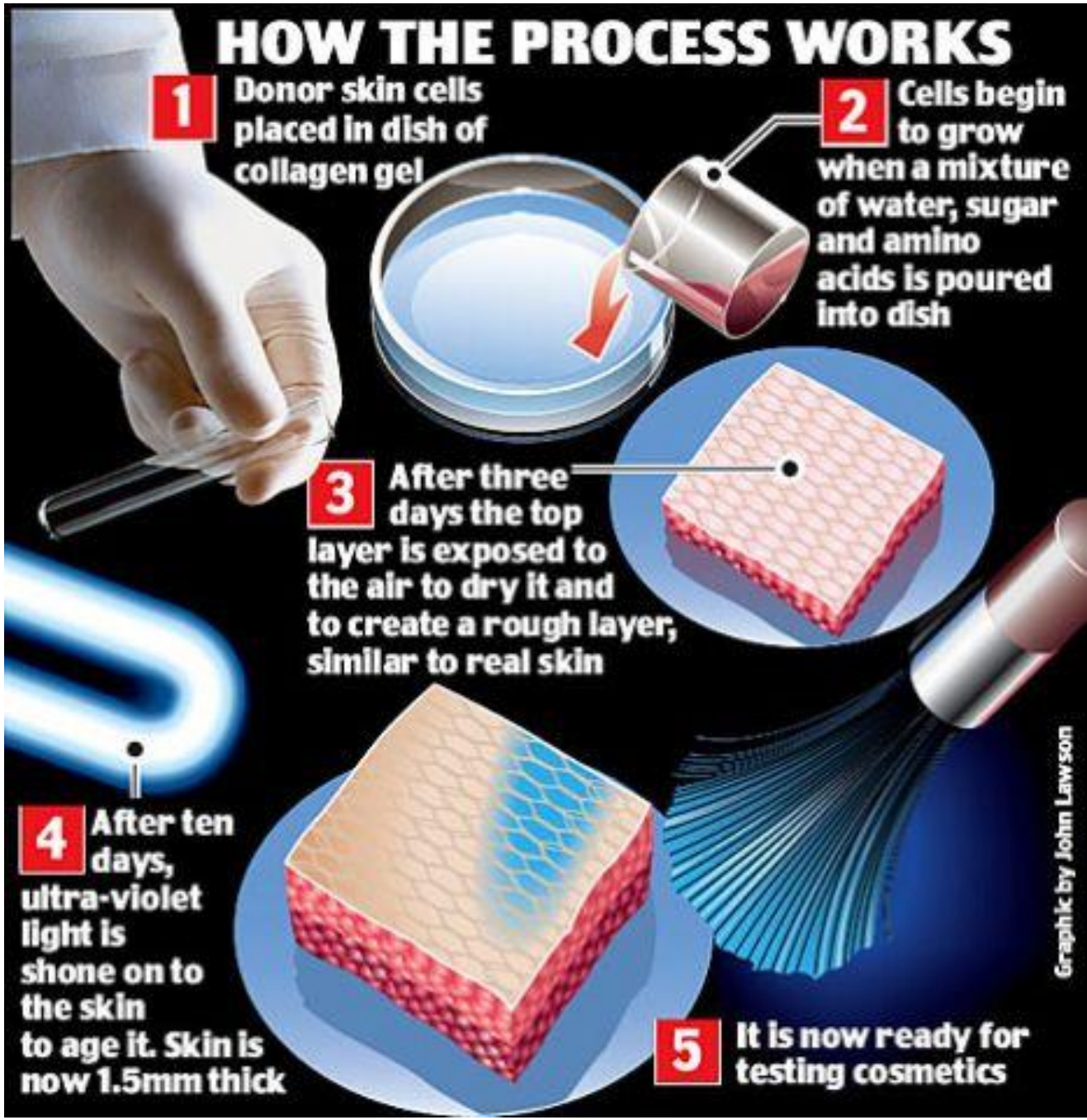
1) Reconstructed human epidermis called Skin Ethic ®

2) Reconstructed human epidermis with melanocytes (different complexions are available from phototype II to VI),

3) Reconstructed human dermis and epidermis: Full Thickness Model

4) Reconstructed Human Corneal (Eye) Epithelium,

5) Reconstructed Human mucosa: Oral, Gingival, and Vaginal Epithelium.

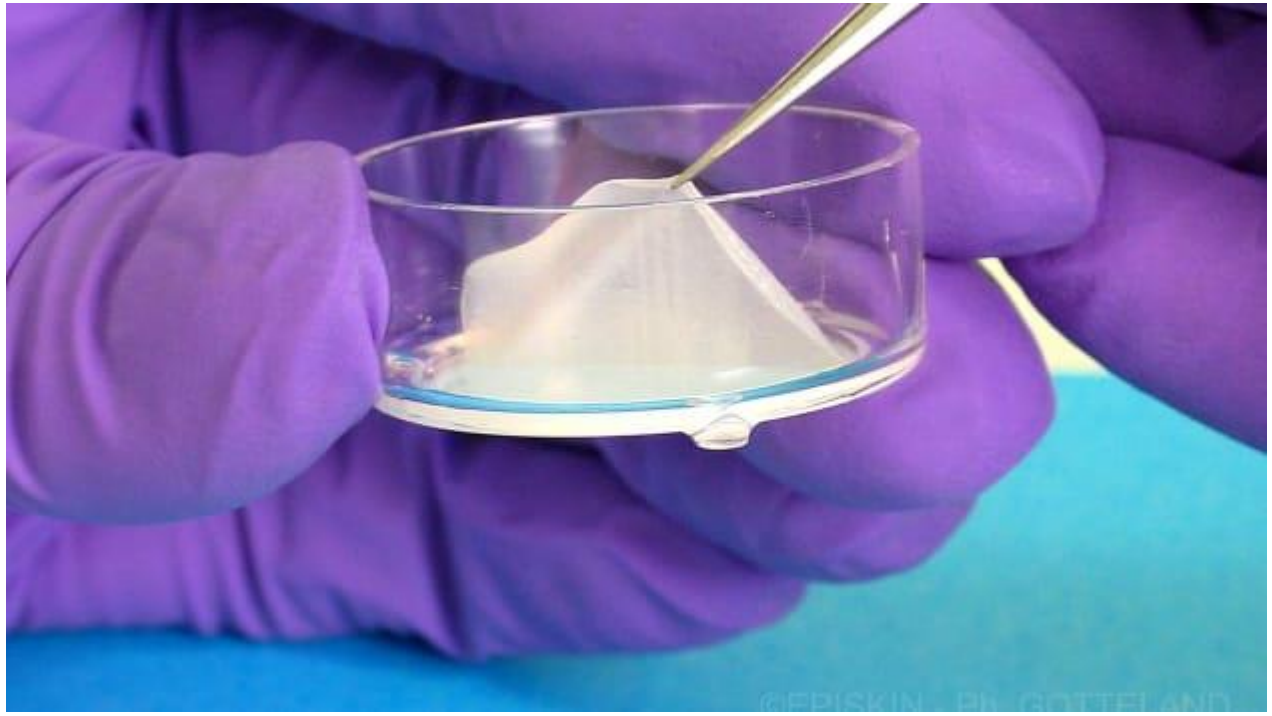


L’Oreal’s EpiSkin is tempering the public outcry over animal testing that’s plagued the cosmetics industry for decades.

L’Oréal is also partnering with the San Diego-based Organovo Co., to engineer 3-D bioprinted human skin and develop technologies that will 3-D print hair follicles into the artificial skin.

In 2011, L’Oréal opened its Predictive Evaluation Center in Lyon, France.

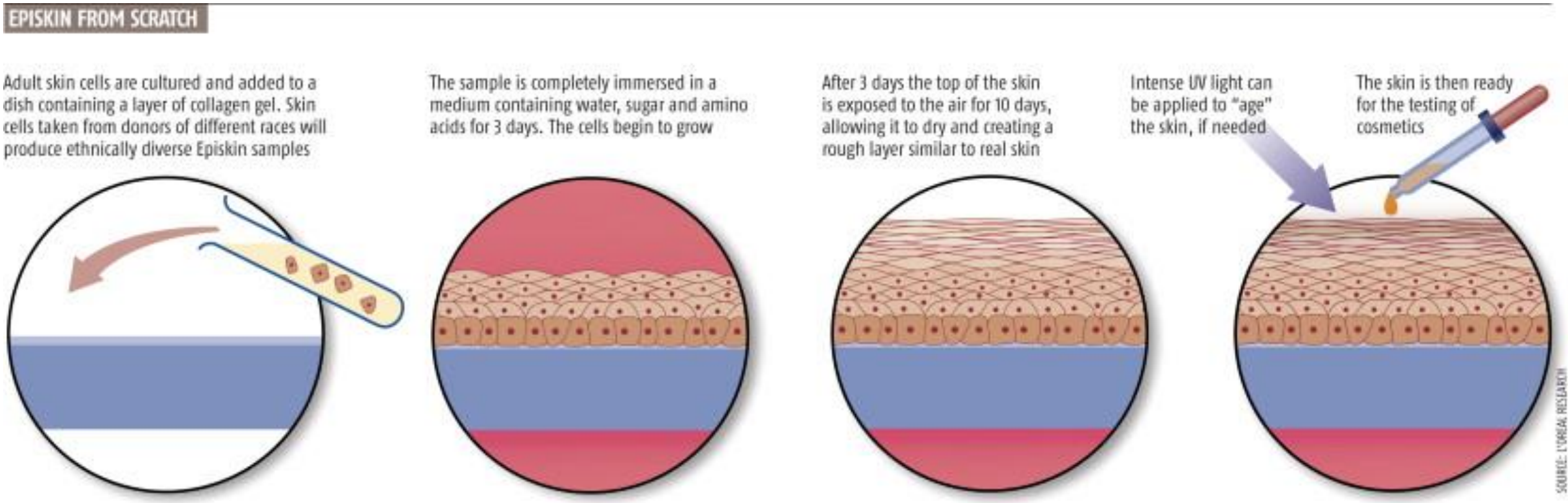
The 12,000-square-foot facility, staffed by more than 60 scientists, grows more than 100,000 human skin tissue samples annually



Reconstructed human epidermis at the Lyon, France EpiSkin facility.

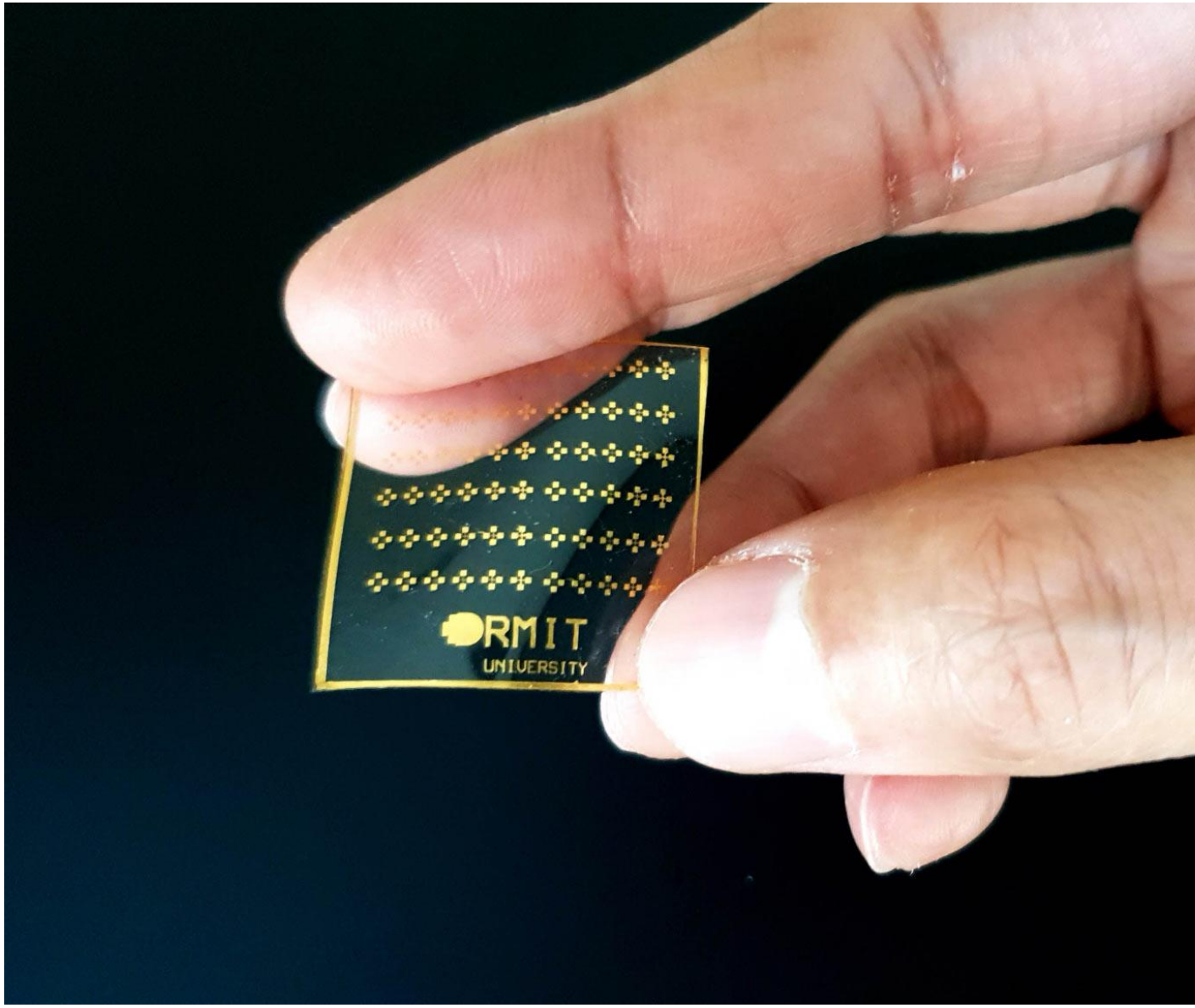
Photo: Philippe Gotteland | L’Oréal /EpiSkin

The Episkin making process:



5) NEWLY-DEVELOPED ELECTRONIC ARTIFICIAL SKIN CAN SENSE TOUCH, PAIN AND HEAT

A team of researchers at RMIT University has developed electronic artificial skin that mimics the human body's near-instant feedback response and can react to painful sensations from Pressure, Heat, or Cold, with the same lighting speed that nerve signals travel to the brain.

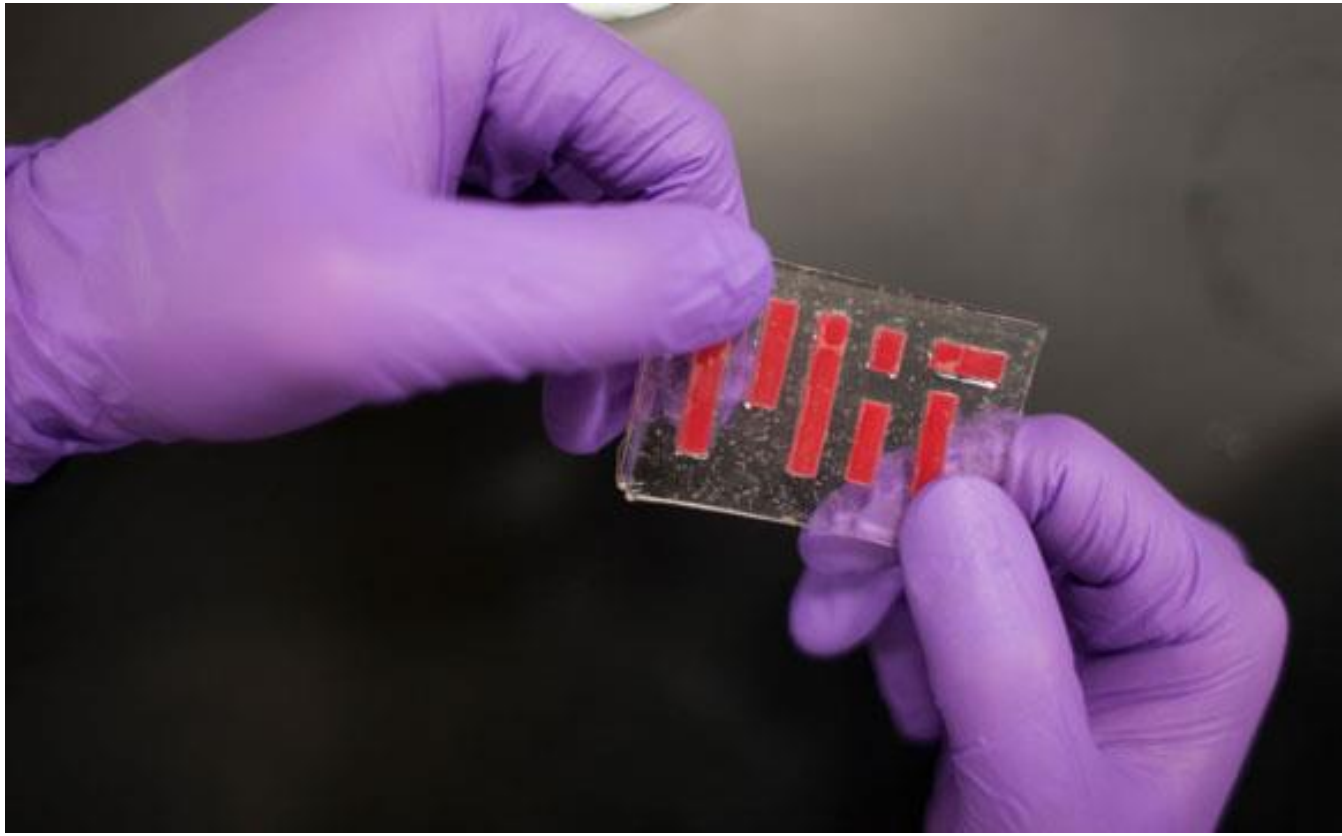


6) NEW HYDROGEL HYBRID COULD BE USED TO MAKE ARTIFICIAL SKIN

MIT engineers have developed a method to bind gelatin-like polymer materials called hydrogels and elastomers, which could be used to make artificial skin and longer-lasting contact lenses.

Made mostly of water, these Hydrogel, gelatin-like polymer materials are stretchy and absorbent until they inevitably dry out.

Now engineers at MIT have found a way to prevent hydrogels from dehydrating, with a technique that could lead to longer-lasting contact lenses, stretchy microfluidic devices, flexible bioelectronics, and even artificial skin.



2 minute video
https://www.youtube.com/watch?v=mrcNc5UT0BM&feature=emb_logo

7) DENOVA CO. ARTIFICIAL SKIN

Scientists in Singapore have created human skin in a petri dish, which could be used an alternative to animal testing in cosmetics.

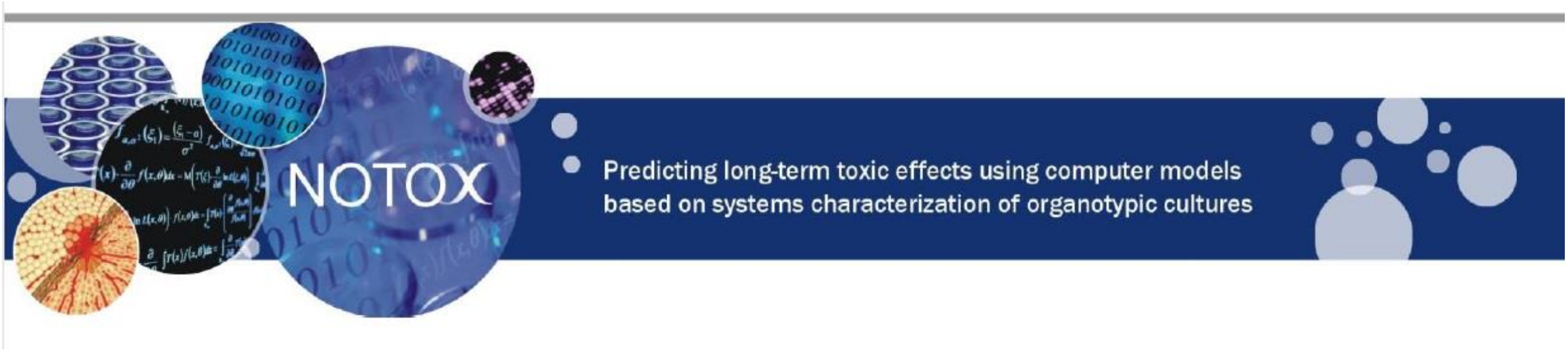
Created by **DeNova Sciences** in collaboration with Singapore's Nanyang Technological University, the thumbnail-sized skin has the same chemical and biological properties as human skin.

The skin can be used to test the toxicity or irritability of a product, with the scientists accelerating the manufacturing process by using a printing machine to create precisely patterned layers, like human skin.

8) NOTOX

To address potential issues with other parts of the human body, research companies such as NOTOX have developed a **synthetic model of the human liver**, which is the main organ to detox the body.

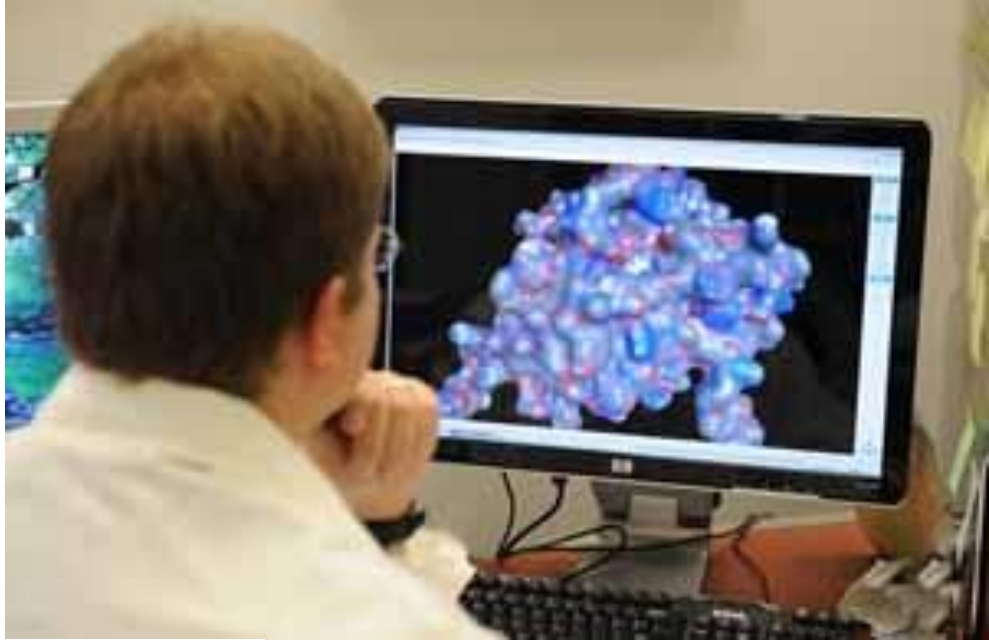
This was done to test harmful ingredients and chemicals to see if the liver can detox those elements.

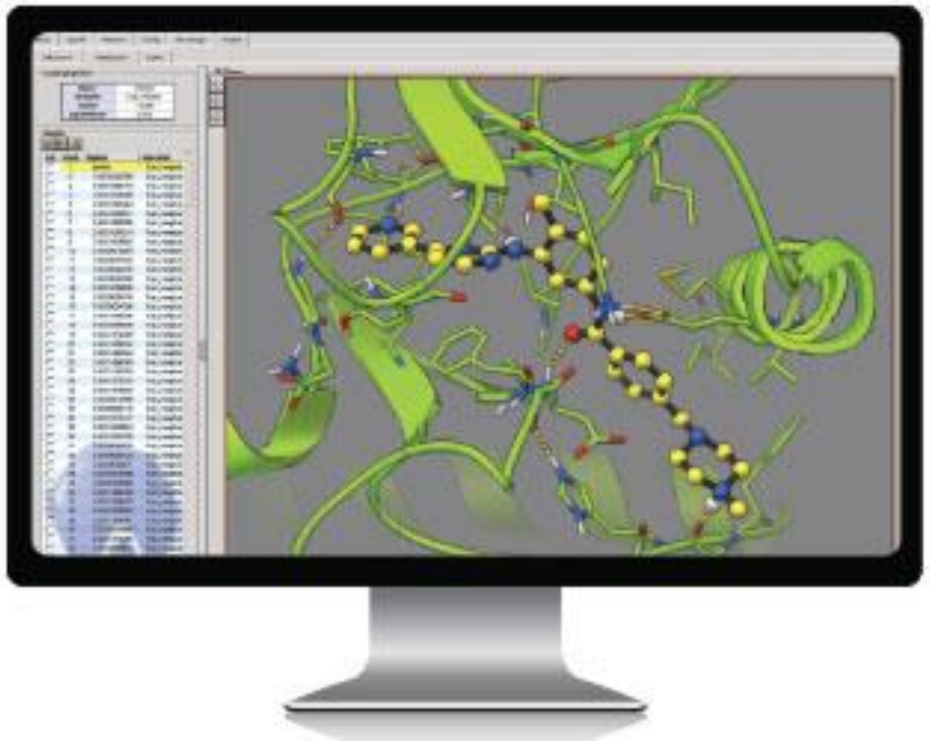


9) COMPUTER (IN SILICO) MODELING

Researchers have developed a wide range of sophisticated computer models that simulate human biology and the progression of developing diseases.

Studies show that these models can accurately predict the ways that new drugs will react in the human body and replace the use of animals in exploratory research and many standard drug tests.

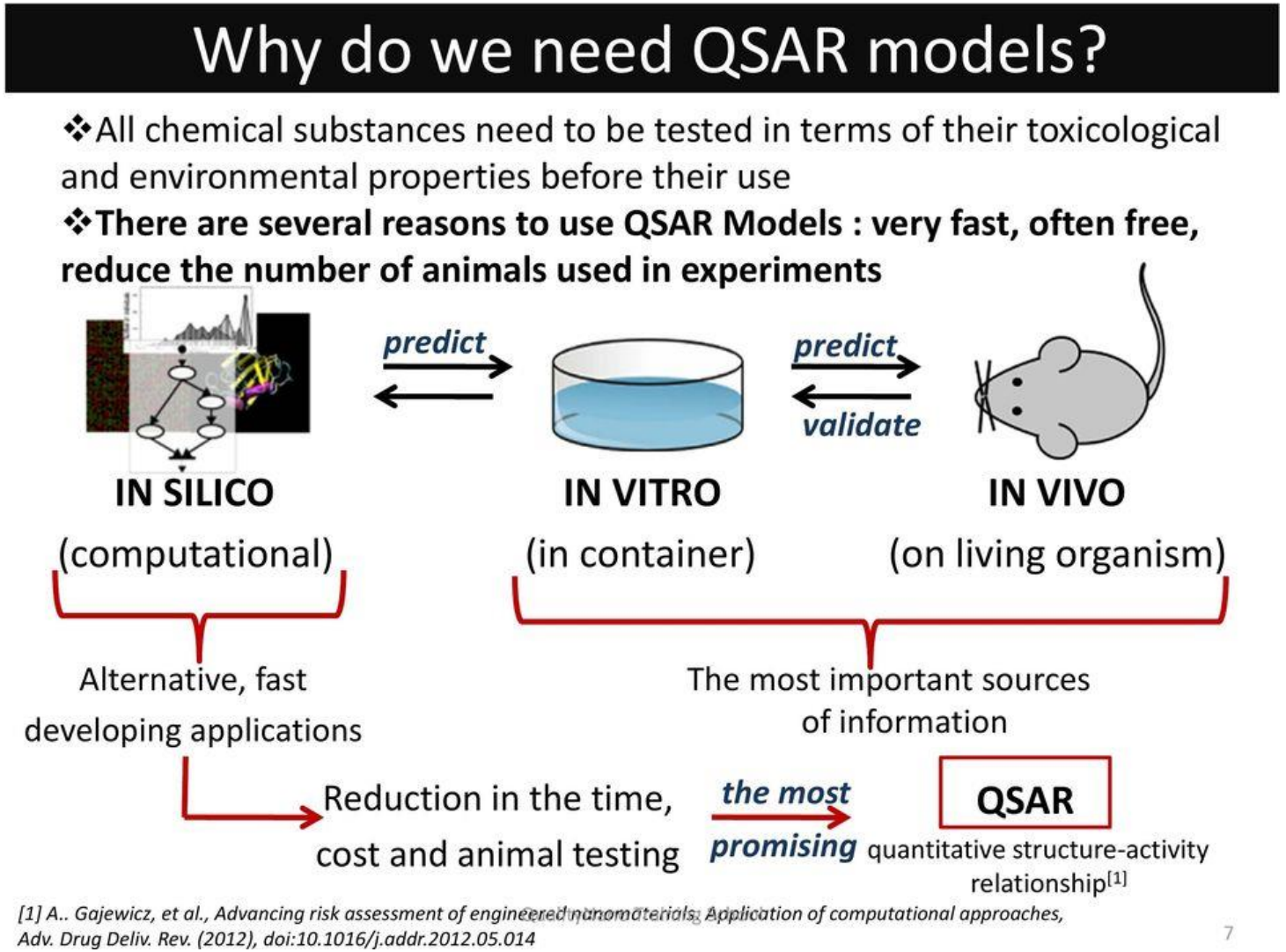




10) QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIPS (QSARS)

They are computer-based techniques that can replace animal tests by making sophisticated estimates of a substance's likelihood of being hazardous, based on its similarity to existing substances and our knowledge of human biology.

Companies and governments are increasingly using QSAR tools to avoid animal testing of chemicals, and PETA actively promotes and funds their use internationally.

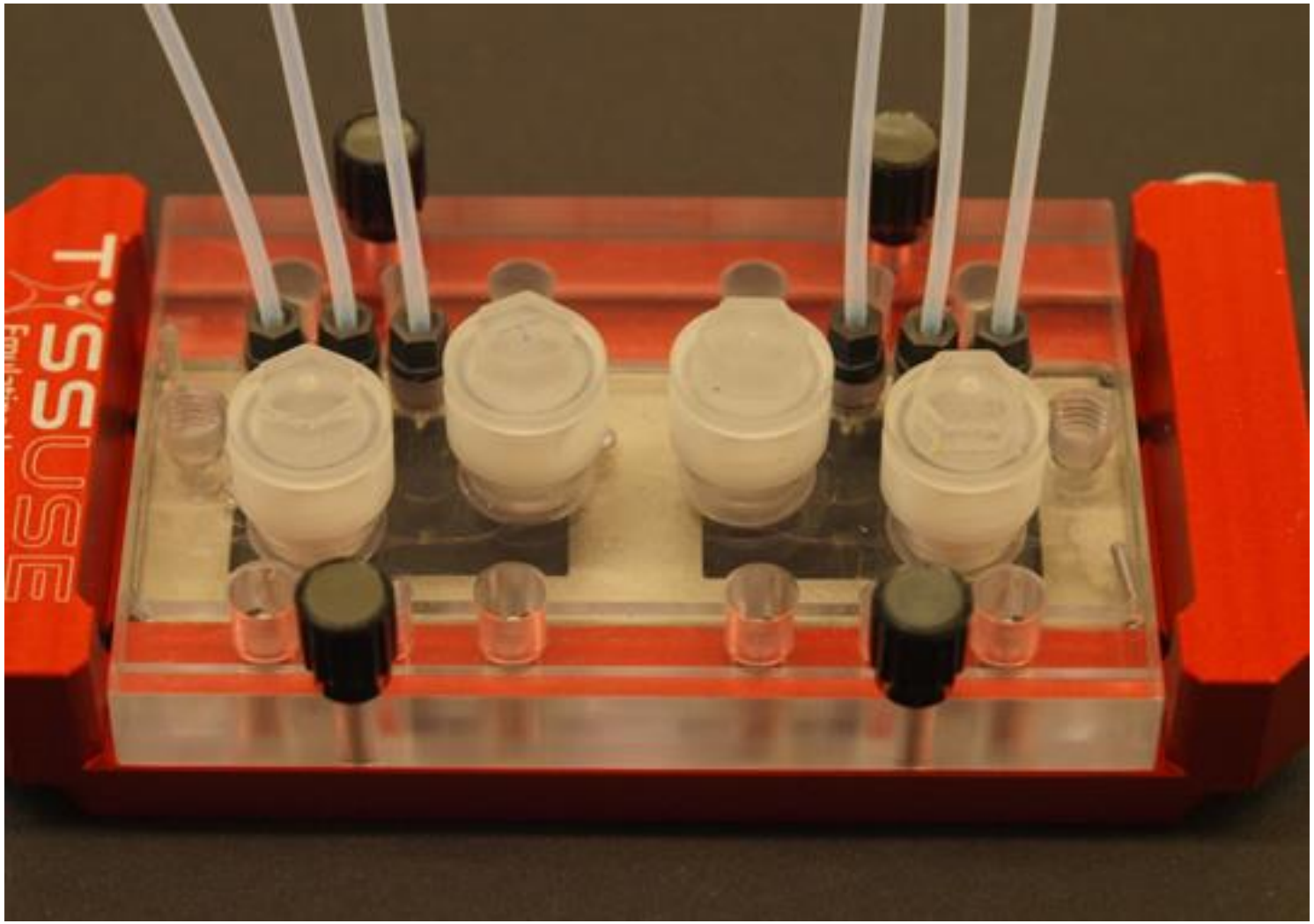


11) HUMAN ON A CHIP

This device which is the size of a Smart Phone is known as a human on a chip.

So far, cells from 4 different organs have been linked together on one chip to mimic the human body.

https://www.youtube.com/watch?v=zVlEr8c-OJk&feature=emb_logo
3.8 MINUTES



12) REPLACING THE DRAISE SKIN IRRITATION TEST

Reconstituted human skin models can be used to replace the notorious Draize skin irritation tests in rabbits and have proven to be more effective at predicting human reactions.

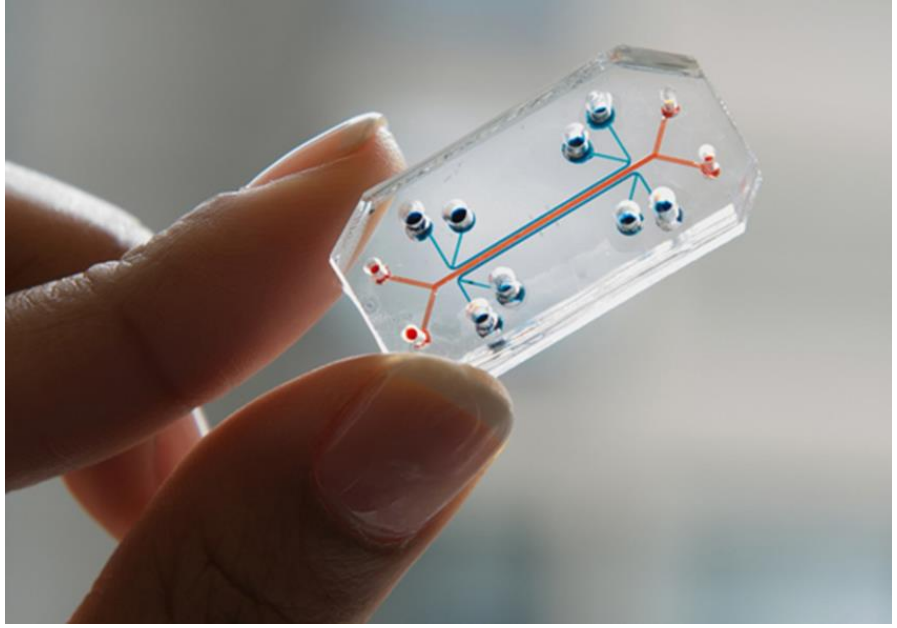
13) LUNG ON A CHIP

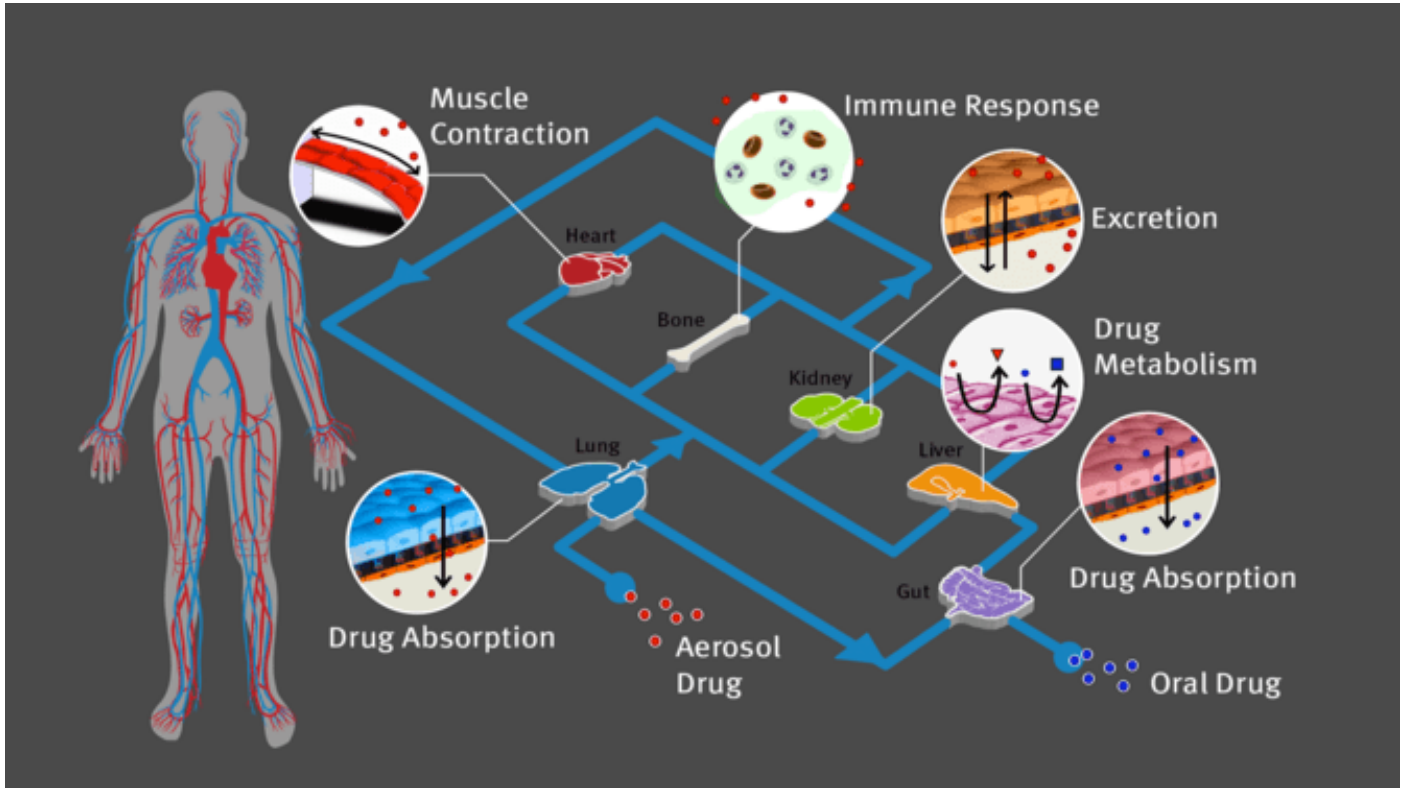
This little device is described as a Lung on a Chip.

It is lined with Human lung cells and can be used instead of animals to study lung disease processes and screen potential drugs

Photo by Wyss Institute at Harvard University

https://www.youtube.com/watch?v=Mg2fJ0UBj_0&feature=emb_logo 2.8 minutes





14) SKIN ON A CHIP

The PETA International Science Consortium Ltd. announced that Patrícia Zoio, a PhD student from the NOVA University of Lisbon, has won its Early-Career Scientist Award to attend a training course on non-animal test methods.

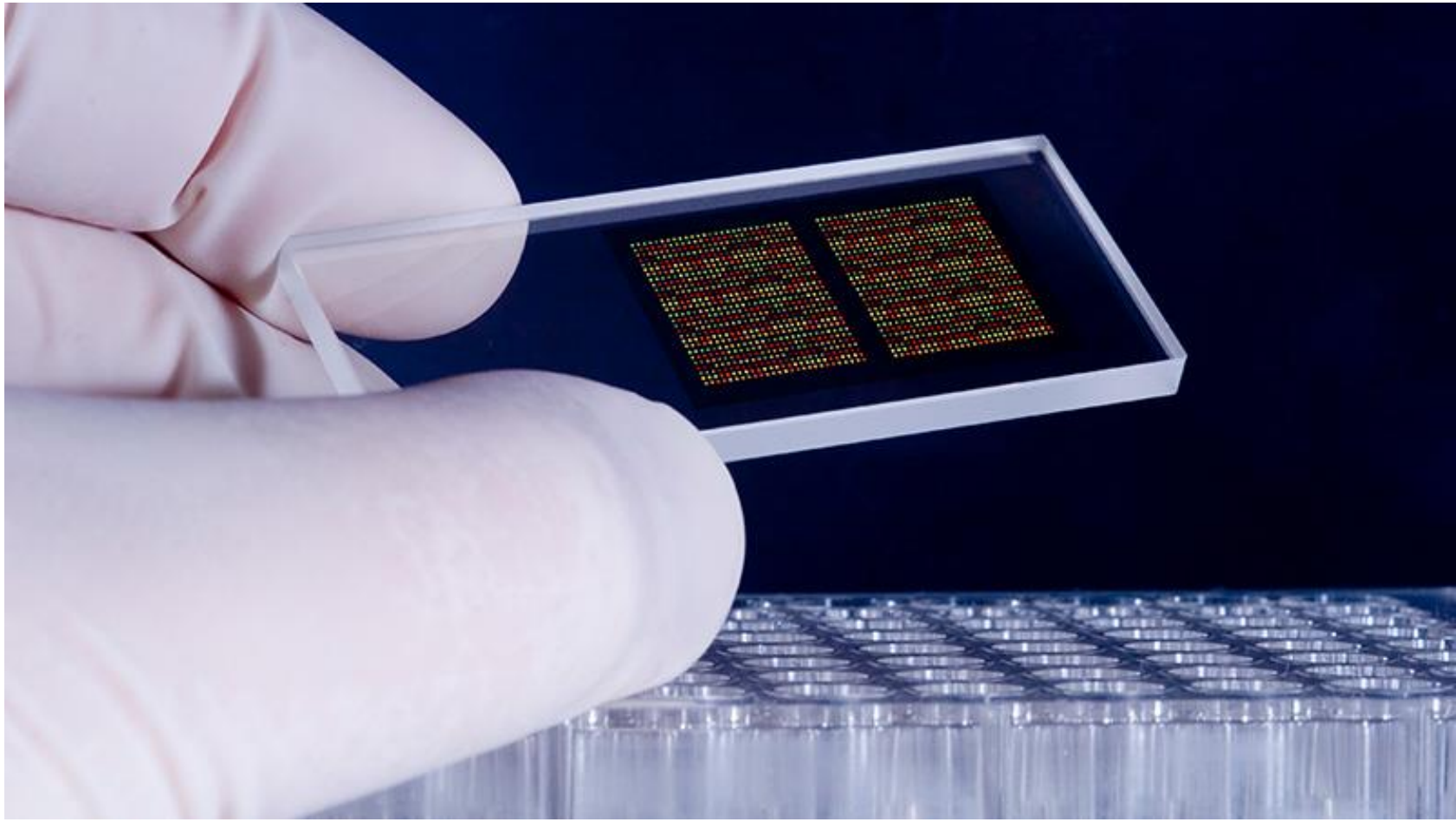
Patrícia is developing a skin-on-a-chip model that could replace the use of animals in long-term skin tests.

15) TISSUE ON A CHIP

Tissue-on-a-chip models, or micro-physiological systems, are a fusion of engineering and advanced biology.

Silicon chips are lined with human cells that mimic the structure and function of human organs and organ systems.

They are used for disease modeling, personalized medicine, and drug testing.



GENOSKIN

Genoskin provides a unique alternative to animal testing by using excess human skin, donated by patients undergoing medical procedures.

The skin is kept alive in testing wells and is developed into a patented testing model for cosmetic, pharmaceutical and chemical companies.

The retrieved skin is superior to animal skin, in the form of bioprinted skin.

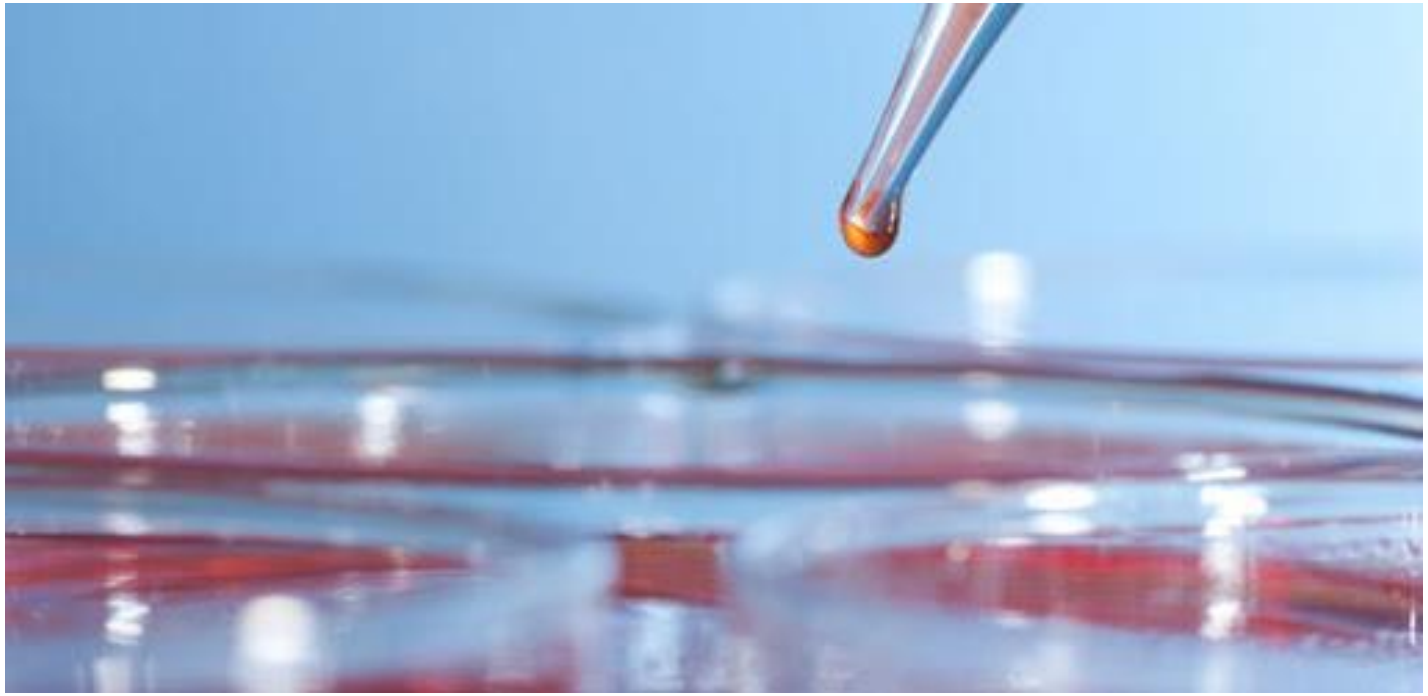
The test skin is a human bilayered skin using bioinks containing human plasma or skin that is grown in laboratories.

14) RESEARCH WITH HUMAN VOLUNTEERS

1) A method called “microdosing” can provide vital information on the safety of an experimental drug and how it is metabolized in humans prior to large-scale human trials.

Volunteers are given an extremely small one-time drug dose, and sophisticated imaging techniques are used to monitor how the drug behaves in the body.

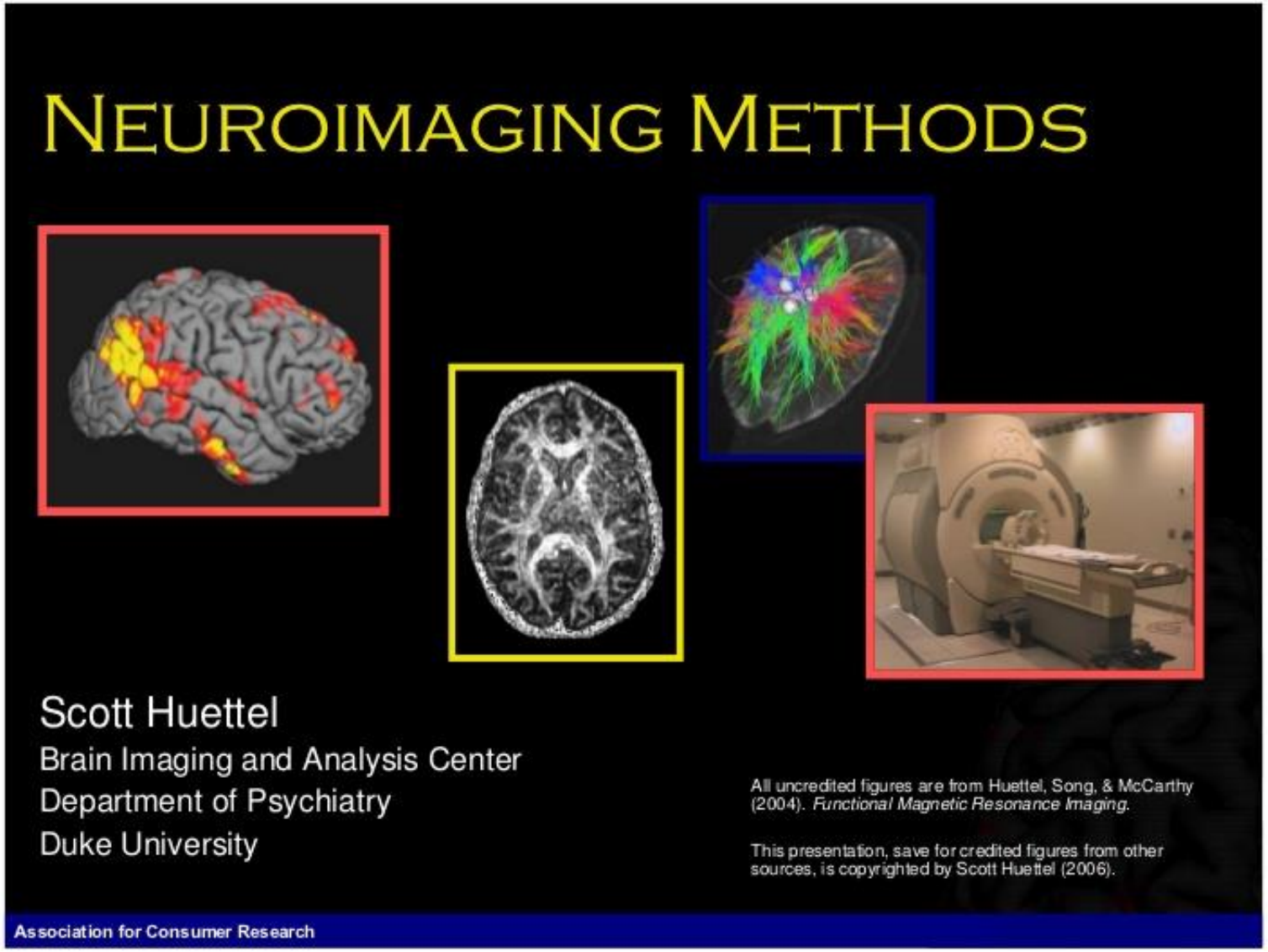
Microdosing can replace certain tests on animals and help screen out drug compounds that won’t work in humans so that they won’t needlessly advance to government-required animal testing.



15) ADVANCED BRAIN IMAGING AND RECORDING TECHNIQUES

Functional magnetic resonance imaging (fMRI)—with human volunteers can be used to replace archaic experiments in which rats, cats, and monkeys have their brains damaged.

These modern techniques allow the human brain to be safely studied down to the level of a single neuron and researchers can even temporarily and reversibly induce brain disorders using transcranial magnetic stimulation.



16) PATIENT SIMULATORS

Strikingly lifelike computerized human-patient simulators that breathe, bleed, convulse, talk, and even "die" have been shown to teach students physiology and pharmacology better than crude exercises with animals.

The most high-tech simulators mimic illnesses and injuries and give the appropriate biological response to medical interventions and medication injections.

17) TRAUMA MAN

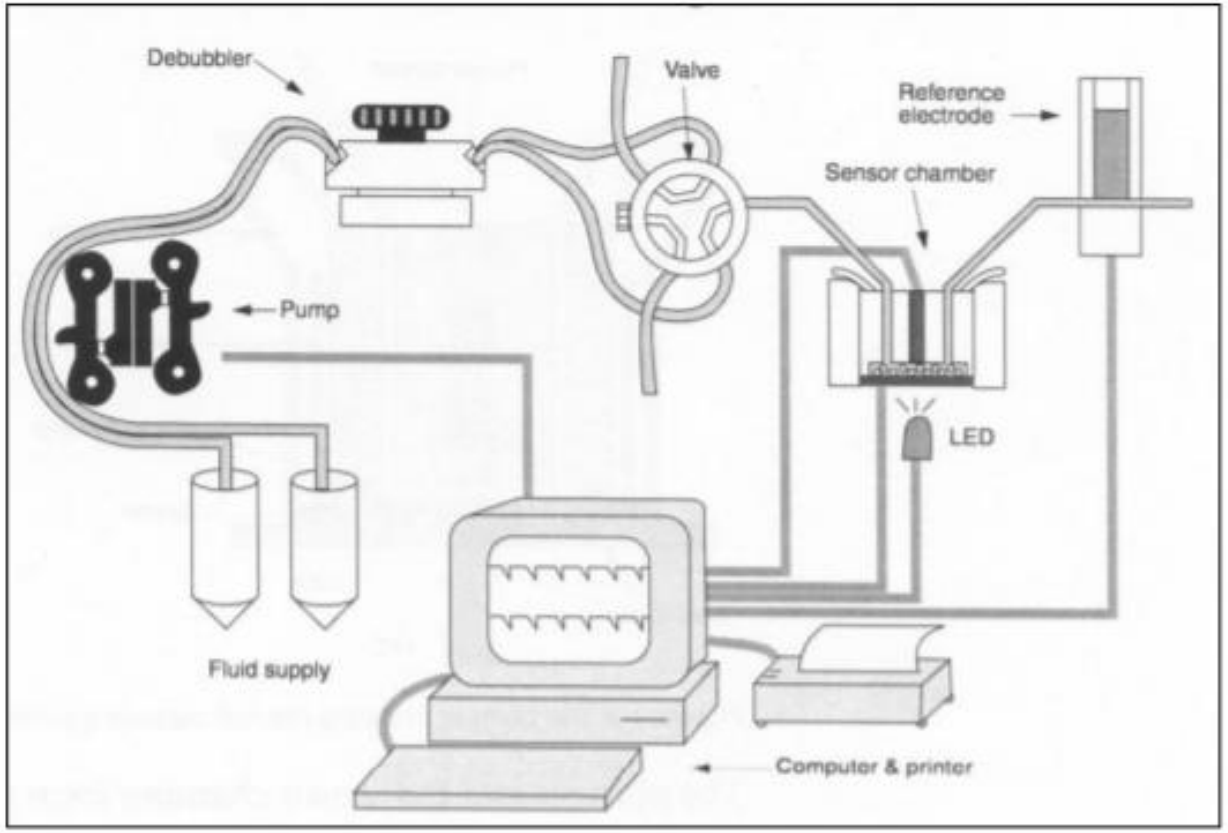
For more advanced medical training, systems like TraumaMan—which replicates a breathing, bleeding human torso and has realistic layers of skin and tissue, ribs, and internal organs.

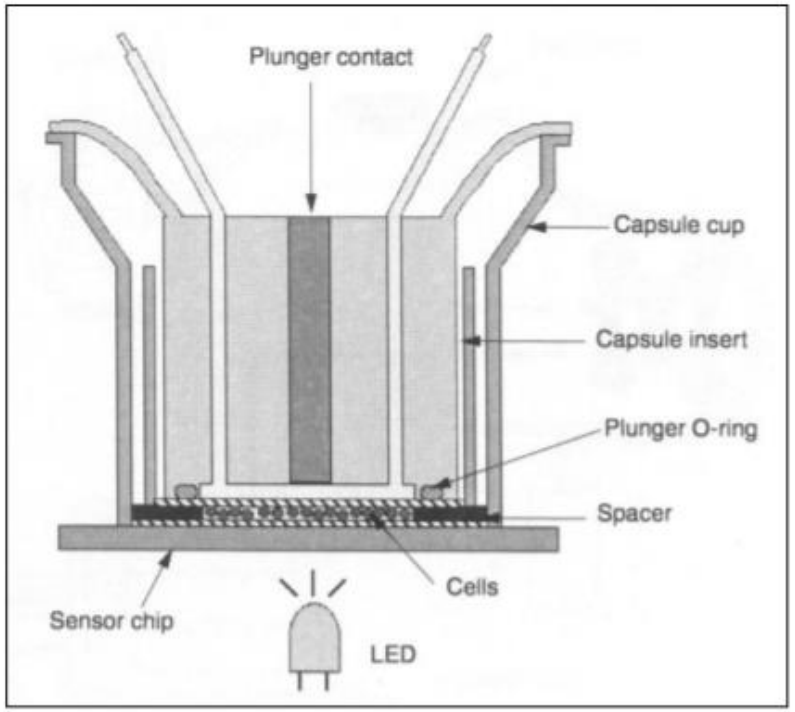
It is widely used to teach emergency surgical procedures and has been shown in numerous studies to impart lifesaving skills better than courses that require students to use animals.

The operating components of the CM instrument (diagram taken from the Cytosensor Manual).

The Cytosensor Micro-physiometer system detects functional responses from living eye cells in minutes and offers novel information on cell signaling that is often unobtainable with other assay methods.

It is an important method for evaluating the effects of chemicals on living cells that can represent that of an eye, so that no animal testing has to be used.





OPTISAFE

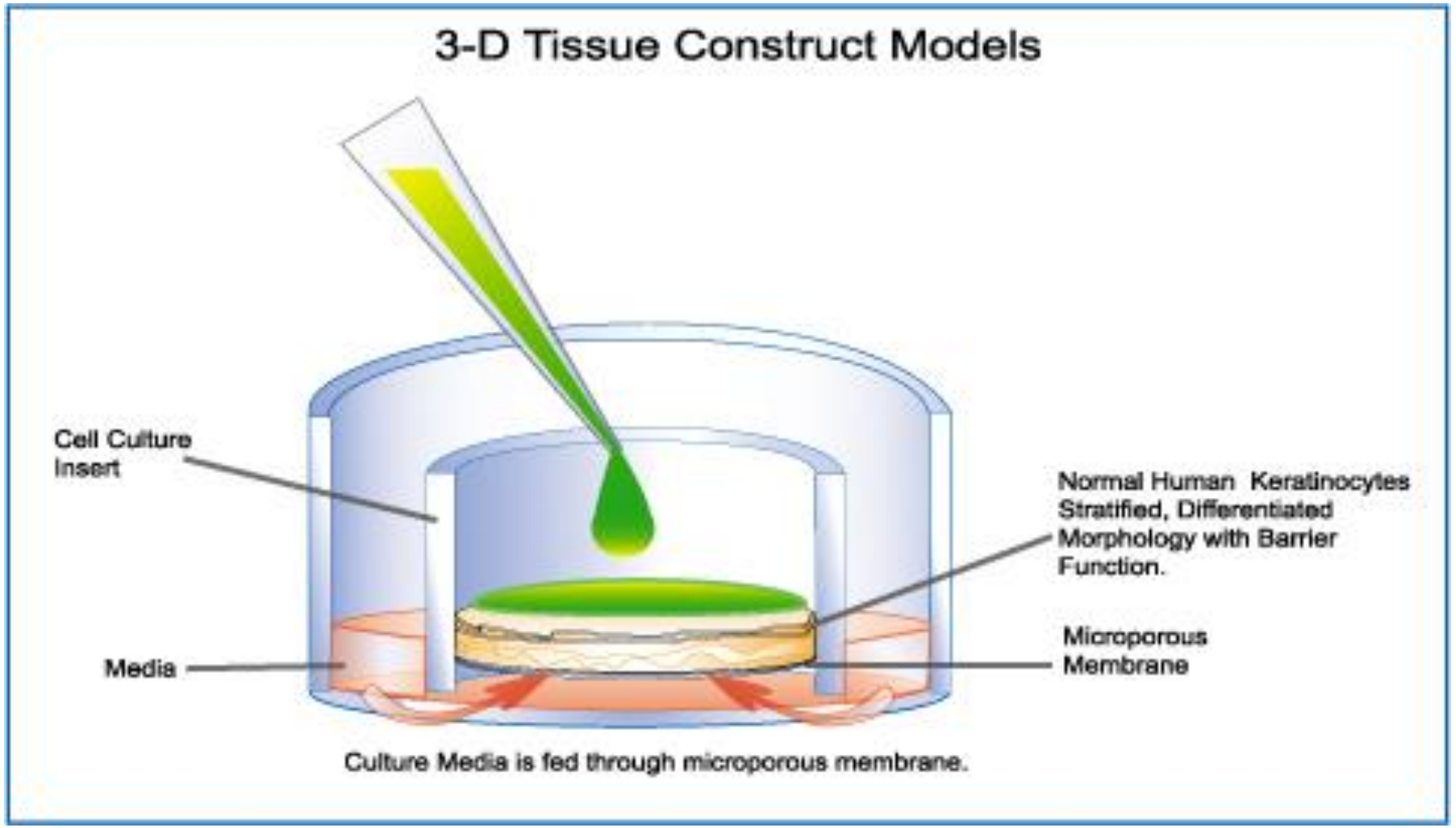
It is an *in vitro* test method in which a test substance is applied to a semi-permeable membrane with cornea eye cells on it.

Damage to macromolecules in the membrane is measured to assess the test substance's potential to cause eye irritation.

Advanced In Vitro Ocular Irritation Testing

MB Research Labs performs the MatTek in vitro 3D EpiOcular™ model for ocular irritation assessment.

The EpiOcular™ tissue model consists of cultured normal, human-derived epidermal cells that have been formed into a stratified, epithelium cell layer, which mimics the human cornea.



THE ALLERGY CHIP

The Allergy Chip, which was co-developed at MedUni Vienna by Valenta's working group, detects potential allergies by means of fluorescent-labelled antibodies.

Currently, serum can be tested for more than 100 allergens at once, ranging from apple to pollen, from grasses, food allergens and bee stings right through to various essentially harmless substances in the environment, such as house dust.

It is especially important to identify allergies in children at an early stage, to prevent subsequent chronic diseases such as asthma, for example. The Chip has now become established worldwide as the safest method for early detection of allergies.

THE END

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https://speakingofresearch.com/

https://www.crueltyfreeeurope.org/RATlist