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LORD DOWDING FUND

- ❑ I enclose a donation to help LDF research projects.
  - ❑ £50 ❑ £20 ❑ £15 ❑ £10 ❑ £..... Other
- ❑ I would like to receive updates on Lord Dowding Fund projects.
- ❑ I would like to donate on a regular basis, please send me a banker's Direct Debit form.
- ❑ Please send me a copy of your Guide to making a Will and leaving a legacy to the Lord Dowding Fund.

Name:_____

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Please pay by cheque or postal order, payable to LDF.

We are sometimes asked by similar organisations if they may write to our supporters. We would allow this only if the organisation is reputable. This allows us to raise funds for our work. However, if you DO NOTwish your name to be included, please tick here. ❑

Send to:

Lord Dowding Fund for Humane Research
261 Goldhawk Road, London, W12 9PE
Tel: 020 8846 9777 Fax: 020 8846 9712
E-mail: info@ldf.org.uk Web: www.ldf.org.uk

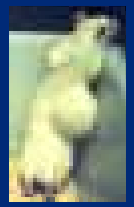
Epidemiology and lifestyle

Epidemiology is the study of disease and its spread. The discovery of the means of transmission and prevention of AIDS, for example, owes everything to epidemiological studies and nothing to animal work. Epidemiology has revealed links between certain chemicals, smoking, radiation, high fat and sugar diets and the probability of various cancers; high fat and salt diets, stress and lack of exercise are all causal factors of coronary heart disease.

This understanding enables people to make social and personal lifestyle changes to improve their health.

There is a long tradition of lifestyle and environmental changes to eradicate disease. During the 19th century, the greatest loss of life was caused by infectious diseases. With better standards of personal hygiene, food, living and working conditions, such diseases began to disappear. Nationally, improved sanitation coupled with the introduction of compulsory isolation for victims of certain infectious diseases, led to these diseases being virtually eradicated, before the use of drugs and vaccines.

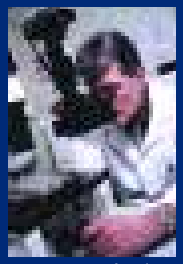
Animal Research: Flawed



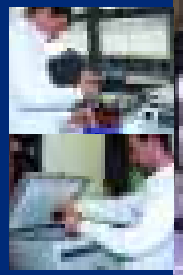
The fundamental flaw of animal-based research is that each species responds differently to substances, therefore animal tests are unreliable as a way to predict effects in humans.

Further difficulties for animal methods are that distress caused to animals by being in the laboratory can affect the outcome of the experiment; test results can be affected by the animal's age, diet, sex, even its bedding material; results from the same tests on the same species can vary from laboratory to laboratory; artificial, laboratory-induced disease is different from natural disease.

The Lord Dowding Fund for Humane Research



The objects of the Lord Dowding Fund for Humane Research are to support and fund better methods of scientific and medical research for testing products and curing disease which replace the use of animals; to fund areas of fundamental research which lead to the adoption of non-animal research methodology; to fund, promote and assist medical, surgical, and scientific research, learning, and educational training and processes for the purpose of replacing animals in education and training. To promote and assist any research for the purpose of showing that experiments on animals is harmful or unnecessary to humanity.



Founded in 1973, the name of the Fund is in honour of the Battle of Britain's Air Chief Marshal the Lord Dowding, a President of the National Anti-Vivisection Society. To date, the Fund has awarded grants approaching £2 million to researchers working on a wide range of fields including microsurgery, toxicity testing of dental fillings, breast and lung cancer, product safety testing, Parkinson's disease, schizophrenia, cot deaths, cataracts, kidney research, cell culture, computer-aided drug design, biotechnology, brain damage, computer teaching packages which replace the use of animals in education of students at school and university level.

Good Science. Saving Animals.

Lord Dowding Fund for Humane Research
261 Goldhawk Road, London W12 9PE
Tel: 020 8846 9777 Fax: 020 8846 9712
Web: www.navs.org.uk

PROGRESS

without Animal Experiments

It is a myth that animals are indispensable to the progress of medical research. History is full of examples of medical progress without animal research.
Furthermore, modern research techniques offer superior replacements to animal procedures. The major advantage is that without the use of animals there are no problems of species differences; the results can be directly applied to human conditions.

Animal experiments give misleading results, which are not replicated in humans and therefore delay the development of medical cures or, even worse, cause damaging effects in people.
Yet there are a wide range of non-animal techniques that avoid this problem.

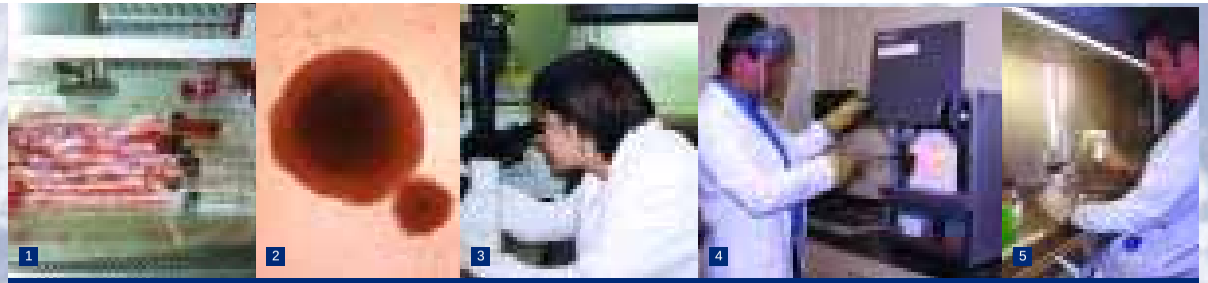
Cell, tissue and organ culture

As long ago as 1885 it was discovered that cells could be kept alive in culture. Today, techniques for growing human cells, tissues and organs, *in vitro*, in the laboratory have advanced enormously. The human material is donated from the deceased or during surgical procedures, and to improve supplies, the UK Human Tissue Bank has been set up. *In vitro* culture methods are used for studying diseases, including cancer and viruses, the activities of enzymes and hormones, the physiology of tissues such as muscles and nerves, and for toxicity testing.

It is due to advances in cell culture methods that a painful animal procedure for antibody production (the 'ascites method'), is being phased out.

'Organ culture' is where small pieces from whole organs are grown, so that some activity can be represented. This is useful for the testing of new drugs, the understanding of the complexity of the body and the development of diagnostic tests that are relevant to humans.

Xenotransplants (animal organs into humans) cause great suffering to the animals, and pose health risks to the human population. New tissue engineering techniques may produce safer alternatives.



1. Discarded human umbilical cords used for research. 2&3. A Lord Dowding Fund (LDF) project examine human cancer cells. 4 & 5. In a unique marriage of different technology, human tissues for grafts are grown in culture on a scaffold of soluble glass fibre in a Lord Dowding Fund project.

in vivo = in the living body

in vitro = outside the body, eg in a culture dish

Human stem cells collected from immature embryos, or blood, or fat or bone marrow can be cultured to grow into any type of tissue. Additionally, a patient's own tissues can be grown on a 'scaffold' and then transplanted back into the patient, avoiding the problems of rejection which are associated with transplants.

Biotechnology

Advances in biotechnology (arising from the human genome project) are offering replacement techniques to animal use for the safety testing of chemicals. When human cells, *in vitro*, are exposed to toxic substances, the genes can be damaged. DNA "chips", carrying short strands of DNA, can be used to identify the damaged genes, thus giving an indication of the degree of substance toxicity. This technology, called toxicogenomics, could not only save the lives of animals, but also offers a superior test method using human material, thus avoiding the problem of species differences. Similarly, the DNA chips have applications in drug discovery, where drugs may be developed to target specific genes associated with diseases.

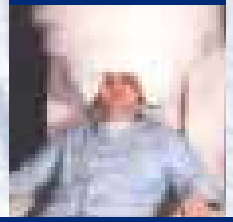
Clinical research

Clinical research is the study of disease in the patient to identify the characteristics, symptoms and possible causes, and new treatments can also be developed. Clinical studies of leukaemia have led to the understanding of the mechanism of anti-tumour activity. Such studies often result in discovering new uses for drugs. This is not surprising, since the real understanding of a drug's action is gained once the drug is in use. For example, aspirin now has many uses other than pain relief, for which it was developed.

Human volunteer studies

Studying people is obviously essential to medical progress and understanding human conditions. Human volunteers may be used for studies of drugs; they play a significant role in psychiatric and psychological research; they are used to assess skin irritation potential of cosmetic ingredients and exposure to toxic substances in the atmosphere. Recent advances in the design of functional brain imaging techniques such as Positron Emission Tomography (PET), functional Magnetic Resonance Imagery (fMRI), Electroencephalography (EEG) and Magnetoencephalography (MEG) allow the brains of humans to be studied, with little or no discomfort to the volunteer. Different sections of the brain can be located and their functions identified.

A Lord Dowding Fund project studying pain in patients by recording electromagnetic fields in the brain.



Human studies properly and ethically undertaken give results far more reliable than those extrapolated from animal models due to the elimination of any species differences.

Computers and mathematical models

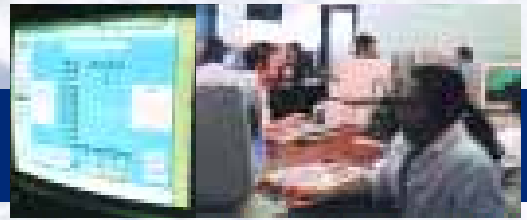
A wide range of sophisticated programmes are now available to researchers (mathematical, database, and modelling systems), allowing studies of the mechanism of drugs, and prediction of likely effects.

Some programmes are models of human systems, even down to the molecular level, against which a potential product can be checked. Others are databases of known chemicals and their effects, where new substances can be entered onto the system and an analysis made against known data.

Educational programmes & aids

Computer programmes are also used in medical training and education, for example simulation of the normal physiology of organs such as the heart, or respiratory control and kidney function. Nerve cells and their reaction to damage and disease, can be mathematically simulated. There are programmes of 'virtual humans' for studying whole body anatomy and tissues, as well as programmes for replacing dissection of animals.

From primary school to medical school and beyond teaching aids are increasingly sophisticated and include models, video, slides and CD-ROM. The Koken Rat model, used in veterinary training, has the look and feel of a real rat. Surgical operation simulators that train for the management of bleeding are also available.



Students are able to study pharmacology and physiology using computer simulations developed by the Lord Dowding Fund.

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