



# 1R is the new 3Rs: The Lush Prize and the need to replace animal tests

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## Introduction

'Alternatives' to animal testing does not always mean the complete avoidance of animal use. Zebrafish, fruit flies, nematodes, animal tissues, embryos, serums and cells are all commonly accepted as 'alternatives'.

The United States Department of Agriculture refer to 'alternatives' as "a term that has different meanings to different people and this difference largely depends on which side of the issue one is found".<sup>1</sup>

However, the use of animals or animal parts can result in suffering or death, issues that 'alternatives' are, in part, designed to avoid.

The Lush Prize promotes 1R over 3Rs, believing that complete replacement of animals is essential for ethical and scientific purposes.

As part of its eligibility criteria for nominations, the Lush Prize has researched the use of animals as 'alternatives' and discussed the ethical and scientific concerns.

## Examples of 'alternatives' that still exploit animals

Species / use	Reasons for use	Ethical and scientific concerns
<b>Invertebrates</b>	Not protected by legislation controlling animal experiments. Inexpensive, easy to maintain. Limulus amoebocyte lysate (LAL) assay replaces use of live rabbit with blood cells from horseshoe crab.	Ethically difficult to justify describing some species as 'lower' animals. Lack of vertebral column is not proof of lack of sentience. Cephalopods are protected by EU animal testing law, acting on the principle of giving the animals the benefit of the doubt. Up to 30% mortality in crabs bled for LAL assay. <sup>2</sup>
<b>Fish</b>	Can produce 100-300 eggs per week. Transparency allows easy developmental staging and study of embryonic and teratogenic effects of chemicals and drugs. Maintenance costs are less than 1/1000th the cost of mice.	Fish can experience conscious awareness, fear, stress and pain. <sup>3</sup> Until recently little effort has been put into welfare of zebrafish in research.
<b>Vertebrates in early developmental stages / use of animal embryos</b>	Fish embryos used as alternative to acute fish test for environmental testing. Chick embryo used in research for tissue/cell transplantation, stem cell and cancer research. Vertebrates only become protected animals at a particular stage in their development.	FRAME: the cut-off point used to determine when vertebrates in early development stages become protected, is arbitrary and unsatisfactory – "it has no strong scientific basis and therefore cannot be ethically satisfactory." <sup>4</sup> Avian embryos greater than two thirds of the way to hatching can experience pain. <sup>5</sup> Different countries often use different species for same test.
<b>Animal-based serums</b>	Animal serum added to the culture media as a source of nutrients. Foetal calf serum (FCS) contains basic components, such as hormones and growth factors.	Increasing availability of serum-free alternatives. FCS involves inserting a needle directly into the heart of the unanaesthetised foetus. The foetus will experience pain and suffering. <sup>6</sup> Some animals (e.g. horses and goats) kept alive and used for regular bleeding. Serum can be contaminated. Use of FCS defeats the purpose of using cell culturing as replacement for animals in research.

## The Lush Prize

The Lush Prize rewards global initiatives to end animal testing, particularly in toxicology. The annual prize of €300,000 is divided between five prize categories: Science, Training, Young Researcher, Lobbying and Public Awareness.

In any year where there is a major breakthrough in 21st Century Toxicology, a Black Box Prize equivalent to the entire annual fund will be awarded to the individual or team responsible. Research is eligible if it fully elucidates and describes a human toxicity pathway, with experimental evidence to demonstrate all the links from the first interaction of one or more chemical molecules to the full effects at the cellular level.

**The Prizes are 1R, not 3R prizes, supporting work to replace animal experiments.**



"Winning the Lush Prize has made an enormous difference to our organisation. It has brought both recognition for all our work to provide training in non-animal test methods, and additional funding to expand this work further."

Dr Carol Barker-Treasure, Managing Director, xCellR8 Ltd

"The Lush Prize has allowed ICAPO to support programs and activities that will implement non-animal approaches directly at the regulatory interface, where they will have immediate impact to reduce animal testing."

Kristie Sullivan, Secretariat, The International Council on Animal Protection in OECD Programmes (ICAPO)



"It has been very important for me to receive the recognition for working with animal-free methods. The Prize made it possible for me to engage four students in the project and thereby spread the knowledge on human research using human tissue only."

Young Researcher, Line Mathiesen



## Conclusions

The use of sentient animals, such as fish, and cruel processes, such as foetal calf serum, should not be accepted by those working in alternatives to animal testing, despite the entrenched position within the research community and regulatory bodies.

They should embrace the concept of '1R not 3Rs'. The use of animals in any way in research is both unethical and scientifically invalid.

The Lush Prize, with its annual fund of €300,000 and research into relevant issues, provides an ideal opportunity to help bring about that change. The research summarised in this poster has formed the basis of the eligibility guidelines for the Prize.<sup>7</sup>



**Literature cited:** [1] Taylor Bennett, B. 1994. Alternative Methodologies. In: Essentials for Animal Research. A Primer for Research Personnel. United States Department of Agriculture National Agricultural Library, 1994. [2] Leschen, A.S. and Correia, S.J. 2010. Mortality in female horseshoe crabs (Limulus polyphemus) from biomedical bleeding and handling: implications for fisheries management. Massachusetts Division of Marine Fisheries. [3] Cottee, S.Y. 2012. Are fish the victims of 'speciesism'? A discussion about fear, pain and animal consciousness. Fish Physiol Biochem (2012) 38:5-15. [4] Balls, M. 1994. Replacement of animal procedures: alternatives in research, education and testing. Laboratory Animals (1994) 28, 193-211. [5] Policy for Use of Avian Embryos. Institutional Animal Care and Use Committee. San Francisco State University. [http://research.sfsu.edu/protocol/policy\\_library/avian\\_embryo](http://research.sfsu.edu/protocol/policy_library/avian_embryo). Accessed 31.7.14. [6] Jochems, C.E.A. et al. 2002. The use of fetal bovine serum: ethical or scientific problem? Altern Lab Anim. 2002 Mar-Apr;30(2):219-27. [7] Lush Prize – Eligibility Guidelines [www.lushprize.org/awards/eligibility](http://www.lushprize.org/awards/eligibility).

For more information scan the QR Code or see: [www.lushprize.org/wc9](http://www.lushprize.org/wc9)

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