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Animal testing is outdated and 'fundamentally flawed'

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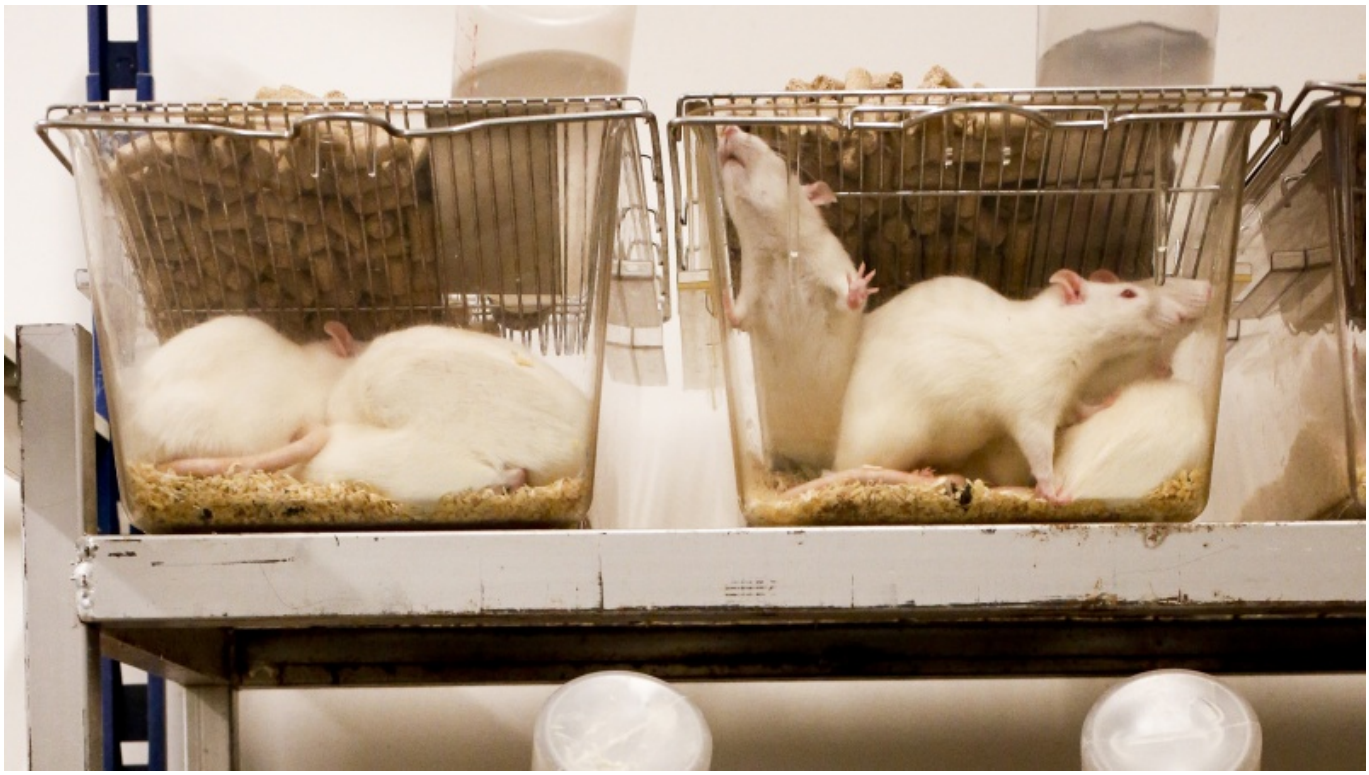
News

The biological effects of products tested on animals differs in human clinical trials, says Emily McIvor.



A growing number of scientists around the world are expressing deep misgivings about our reliance on animal experiments, especially for product development and testing. Animal models have traditionally been accorded a 'gold standard' status that they do not deserve.

The US food and drug administration estimates that nine out of 10 drugs that appear safe and effective in animal studies fail when they reach human clinical trials, demonstrating beyond doubt that the use of animals to predict biological effects in human beings is fundamentally flawed.

Several recent systematic reviews of animal experiments have revealed inherent weaknesses and failures due to differences between species and poor experimental design.

The flagship journal, Nature, has called on the research community to tighten animal research planning and analysis. It is, for instance, common for results of tests in one animal species not to predict the same result in another. Yet animal models are still expected to accurately predict

reactions in human beings.

Sadly, the 11.5 million animals used in EU laboratories in 2011 are testament to the fact that tradition and faith in what was described as the 'high-fidelity fallacy' in 1959, namely that results in one mammal will predict what happens in humans, persists.

Change is needed. Part of the solution lies in decisions taken by research funders, whether these are public, at EU or national level, private charitable organisations or companies.

Several flagship research projects have already switched to new technologies that rely on the use of human cells, organs and systems integrated with advanced computational techniques to initiate a new 'systems toxicology'.

Several animal models of disease are now receiving the same kind of critical evaluation. Animal models of stroke and asthma, diseases that afflict millions of people worldwide, have consistently failed to deliver new therapies and the need for new approaches is increasingly being recognised.

New funding opportunities are becoming available. Commercial companies specialising in providing in vitro analytical techniques are thriving. Public funding can also be channelled through regional development budgets, as we see in the UK's centre for alternative testing and in-vitro monitoring (CATIM) project, which provides lab space and resources for small companies through the university of the west of England.

AXLR8, the EU coordinated research programme to accelerate the transition towards more predictive, non-animal approaches in toxicology, is just one example of how the EU can lead the world in research excellence when it is guided by good science rather than an unthinking reliance on traditional approaches.

In toxicology, we now realise that the animal tests first developed in the 1920s are not fit for purpose. The human cell tests, high-throughput robot systems and powerful new computer programmes replacing animal test approaches mark a bold new era in safety testing based on human biology-based approaches capable of elucidating chemical reactions at the cellular level, rather than broad and misleading extrapolations from mice to men.

As new generations of scientists emerge, and new technologies are developed that exceed our wildest expectations of what's possible, more and more we will see science challenging its traditions, replacing animals and in so doing, improving the quality of our biological understanding and prediction of safety of chemicals and the effectiveness of new medicines.

About the author

Emily McIvor is policy director at humane society international's (HSI) research and toxicology department

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