

Top Three Reasons to Move Away From Animal-Based Studies

The goal of the life sciences field is to design and produce new reagents, technologies, and medical therapies to enhance, heal, and protect human life. In recent decades, there has also been a growing emphasis on moving away from animal-based studies in favor of methods using human cells. This was introduced through the three Rs principle, which calls for replacement, reduction, and refinement as core ethical principles to help decrease the use of laboratory animals in scientific work. Regulatory agencies in both the United States and Europe have embraced this challenge.

The movement toward all-human solutions picked up momentum in 2003, when the Seventh Amendment to the European Cosmetics Directive banned acute toxicity testing in animals throughout the cosmetics industry. The United States followed suit in 2019 when the Environmental Protection Agency issued a directive prioritizing efforts to reduce animal testing. Future EPA limitations are on the horizon, including a move to reduce funding for animal studies by 30 percent by 2025, and requiring special approval on a case-by-case basis after 2035. The Food and Drug Administration joined this movement in 2021, affirming in its [“Advancing New Alternative Methodologies at FDA”](#) report that it is working toward reducing animal testing.

Beyond government regulations, there are scientific factors driving the focus on human cells for research. Here are the top three reasons to move away from animal studies:

Animal studies do not always detect effects and outcomes specific to humans.

- During drug development clinical trials, as many as 96% of the medications that successfully complete the nonclinical testing phase fail once they reach the point of testing in humans, according to the 2019 study, [“Advancing Nonclinical Innovation and Safety in Pharmaceutical Testing.”](#) This finding suggests major problems with predictability in the preclinical phase when animal-based testing is heavily emphasized.
- There may be a low level of concordance between animal and human cells, according to a 2017 study, [“Current Nonclinical Testing Paradigm Enables Safe Entry to First-In-Human Clinical Trials: The IQ Consortium Nonclinical to Clinical Translational Database.”](#) This report from members of the pharmaceutical industry included an analysis of 182 submissions for large and small therapeutic molecules. The study determined that the specificity of rodent liver studies to human liver studies is 68%. The concordance between monkey liver studies compared to the human liver was 94%. It is generally considered that non-human primates such as monkeys more closely mimic human *in vivo*.

Animal testing is expensive and time-consuming. Animal tests are anywhere from 1.5 to 30 times more expensive than *in vitro* testing, according to a 2019 report, [“Limitations of Animal Studies for Predicting Toxicity in Clinical Trials.”](#) For industrial toxicity testing using animal studies, it takes about a decade, at a cost of \$3 million, to register a single pesticide.

Scientific innovations are making it easier than ever to rely on all-human testing. Increasingly, primary human cells are becoming more available to support research applications. It is also easier to find human-based organ-on-a-chip platforms, as well as microphysiological systems representing several organ and tissue systems. LifeNet

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Health LifeSciences, for example, is working with partners to beta test a pioneering all-human hepatocyte triculture system that blends epithelial, stromal, and endothelial cells in a unique way that allows for essential cell-to-cell interactions. Our triculture system offers stable, reproducible results – experiment to experiment, user to user, and lab to lab.

In addition, LifeNet Health LifeSciences offers primary human hepatocytes, liver non-parenchymal cells (including Kupffer cells, stellate cells, and liver endothelial cells), thyrocytes, and more. [Learn more about our research solutions.](#)

Researchers in the life sciences field have many good reasons to consider replacing, reducing, and refining as we move toward safer, more effective screening methods using all-human solutions. Partnering with a forward-thinking organization such as LifeNet Health LifeSciences can make all the difference when it comes to forging new paths to create innovative medical solutions and therapies.

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