No More Phasing Out: Time to End Animal Testing Now

Savita Nutan MSc, DipRCPath, PGCert(HE)
Founder of Medicine Without Cruelty

Estimated 115-200 million animals globally per year used in science

Poor Reproducibility,
Shocking failure rates,
Inability to model human diseases

Why have we not ended this immediately?

"The time is now to embrace scientifically effective non-animal methods that can save lives—both human and animal."

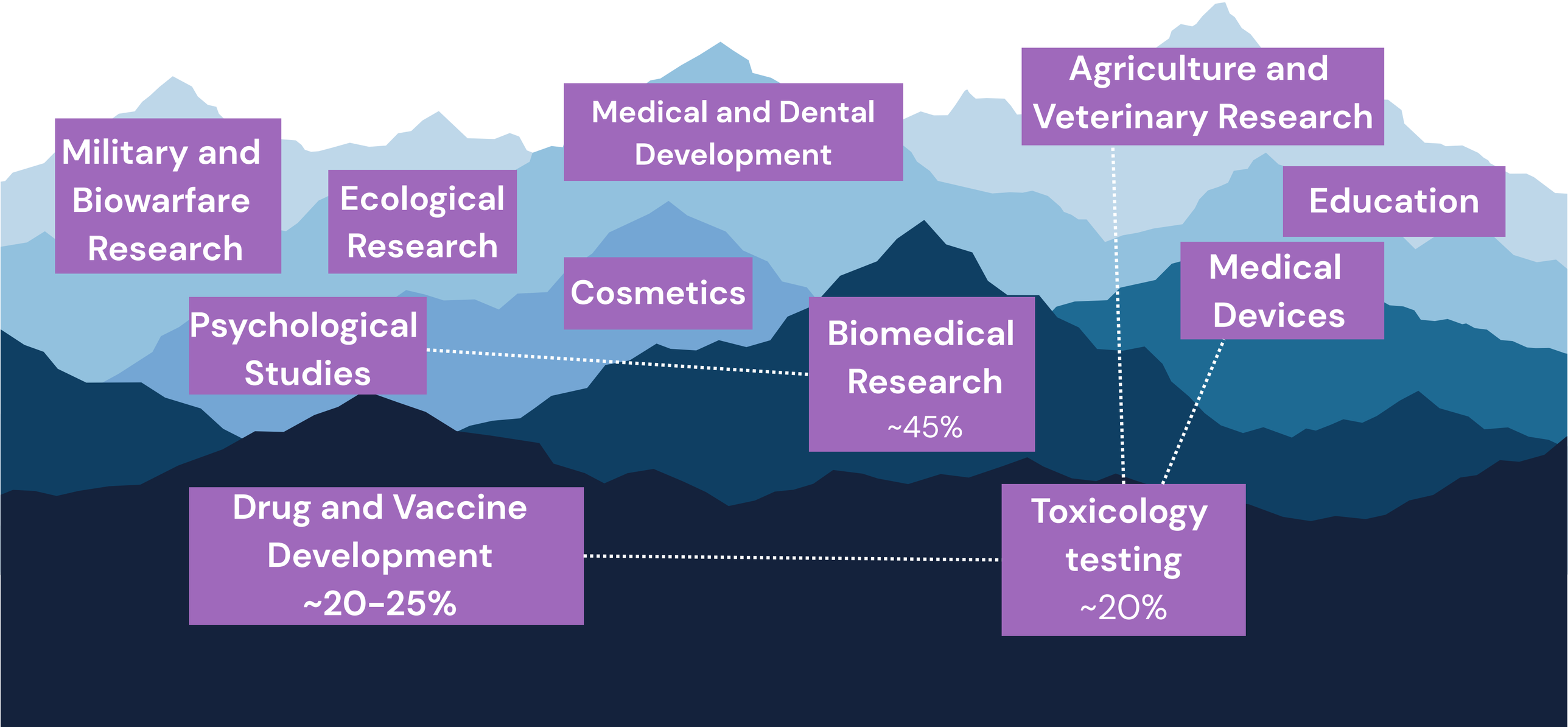
Today’s Seminar

Why animal testing must end now: The Scientific Imperative

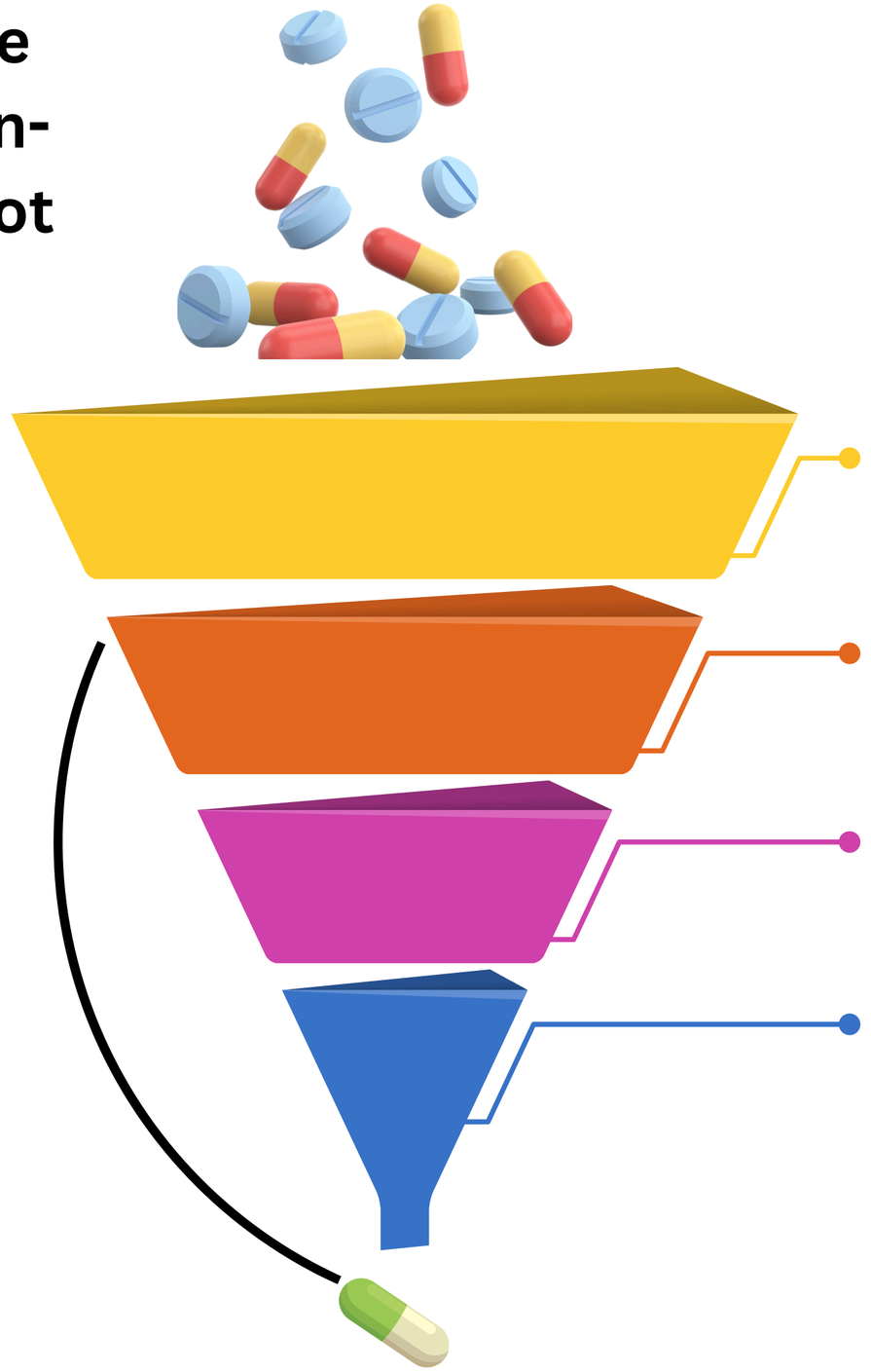
Alternatives that can replace animal testing now

Why the ‘phase-out’ approach is harmful and insufficient

How long will we continue this practice when non-animal alternatives are available now?



With the 95% failure rate in drug development, non-animal alternatives are not a choice—they're a scientific necessity



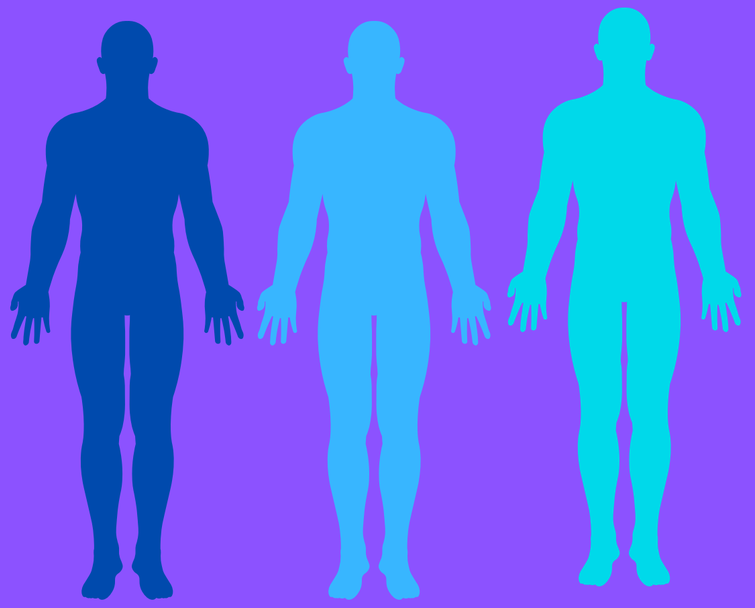
Ineichen *et al.*, 2024; Marshall *et al.*, 2023

GENETIC SIMILARITY BETWEEN ANIMALS AND HUMANS ARE SUPERFICIAL

mutations in how chimpanzees process certain sugars (called sialic acids), which affects chimpanzee metabolism

Significant genetic difference in how cells recognise and respond to each other

Significant genetic difference in immunity



99% similarity between Chimpanzees and Humans

ANIMAL-HUMAN DIFFERENCES = DEADLY CONSEQUENCES

Drug Metabolism

Vioxx (arthritis drug) led to 320,000 heart attacks, strokes, and heart failures worldwide — with 140,000 deaths before it was pulled in 2004.

Yet in mice, rats, dogs, and monkeys, it appeared protective against heart disease.

Isuprel (asthma medication) was tested on rats, guinea pigs, dogs, and monkeys — but caused 3,500 deaths in the UK alone.

Immune Response

TGN1412, a monoclonal antibody therapy for autoimmune diseases and leukemia, passed extensive safety studies in monkeys.

But in 2006, six human volunteers given just 1/500th of the “safe” dose suffered life-threatening multiorgan failure.

Personalised Medicine

Genetic diversity in humans leads to varying responses to drugs, while animals, with low genetic diversity, cannot replicate these responses.

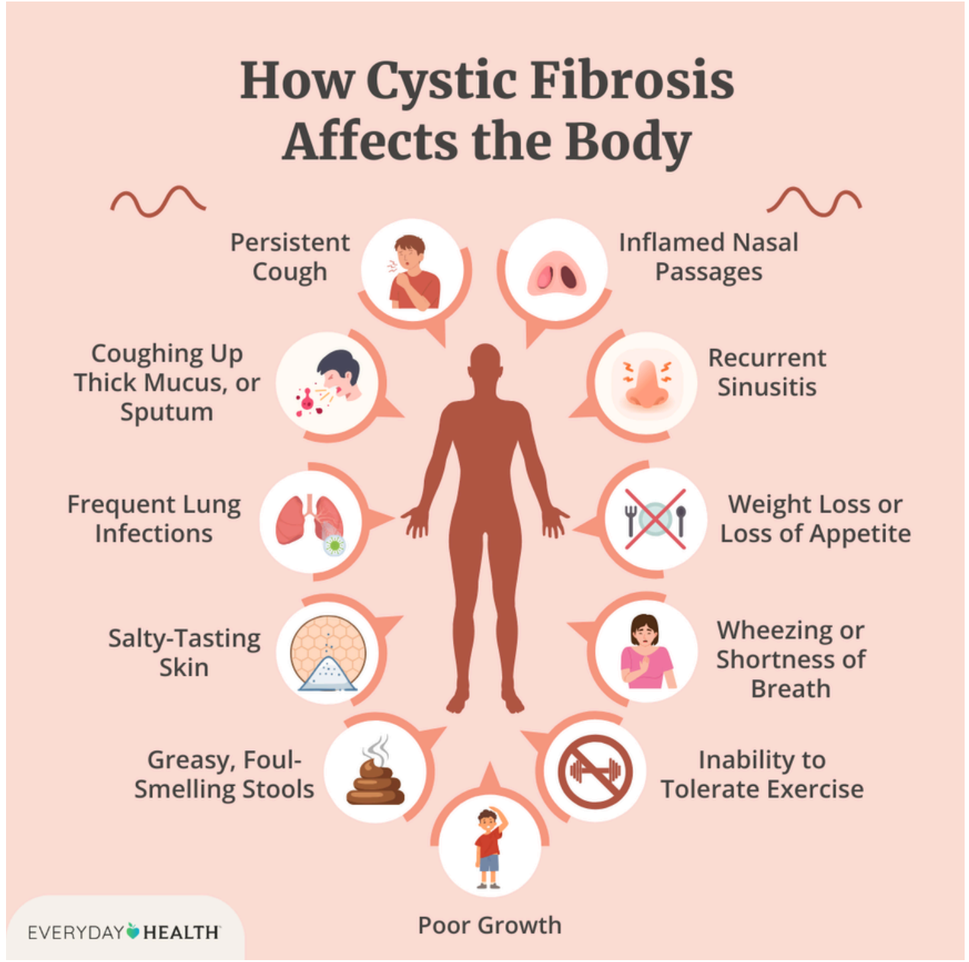
https://medicinewithoutcruelty.com/about-mwc/humans-suffer-too/

Human Disease Cannot be Modelled in Animals

Mice do not develop spontaneous lung infections or mucus plugging.

Even in CF pigs and ferrets, lung infections don't always progress like in humans.

Digestive enzyme deficiencies vary across species. Mice have compensatory mechanisms, making symptoms milder.



Lung function decline (e.g., FEV_1) isn't measurable in animals. Animal cannot simulate progressive breathlessness.

Nutritional and systemic effects are inconsistent. CF mice often maintain normal weight and growth.

Most animals lack upper airway infections

Human Complexity Cannot be Modelled in Animals

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No animal replicates the full spectrum of CF. Human-based methods like patient-derived organoids offer a complete and predictive platform for understanding and treating this complex disease.

Digestive enzyme deficiencies vary across species. Mice have compensatory mechanisms, making symptoms milder.

Most animals lack upper airway infections

Why animal testing continues to fail humans – across every field of medicine

Disease Area	Animal Research and Testing Failures
Alzheimer's	Mice cured many times, but 99% of drugs fail in human trials
Stroke	Over **1,000 experimental drugs** succeeded in animals, **zero translated**.
ALS	Mice cured many times — **no effective treatment** in humans.
HIV	Vaccines that worked in monkeys **failed in humans**, some made infection risk worse.
Sepsis	~150 treatments succeeded in mice — **all failed in patients**.
Type 1 Diabetes	18 cures in mice in a year — **none cured humans**.
Asthma	Mice do not naturally develop asthma — results **do not reflect real patients**
Cancer	Mice cured of cancer for decades — **patients still waiting**.

Cummings et al., 2014 (Alzheimer's); O'Collins et al., 2006 (Stroke); Perrin, 2014 (ALS, Asthma); Bailey et al., 2008 (HIV); Marshall, 2014 (Sepsis); Shapiro et al., 2000 (Type 1 Diabetes); Nikanjam et al., 2022 (Cancer).

Why animal testing continues to fail humans – across every field of medicine

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Cystic Fibrosis is just one example. This is a systemic issue — not the exception, but the rule.

From Failure to Progress: Non-Animal Methods in Action

Cystic Fibrosis: Ivacaftor

- No animal could replicate the human specific CF mutation (G551D)
- Lab-grown human cells and tissues
- Treated patients had 55% fewer pulmonary exacerbations, gained weight, and showed large drops in sweat chloride levels (restoring them toward normal)

Ivacaftor's success in humans, following its discovery in human cells, exemplifies how human-based methods can yield effective treatments that would have been missed if we relied solely on animals.

Organoids That Predict Real Patient Response

Human-derived organoids show real-time response to CF drugs.

Predictive of clinical benefit — modulator response varies by mutation.

No animal could replicate this spectrum of response.

FDA now supports the use of data like this in early drug evaluation.

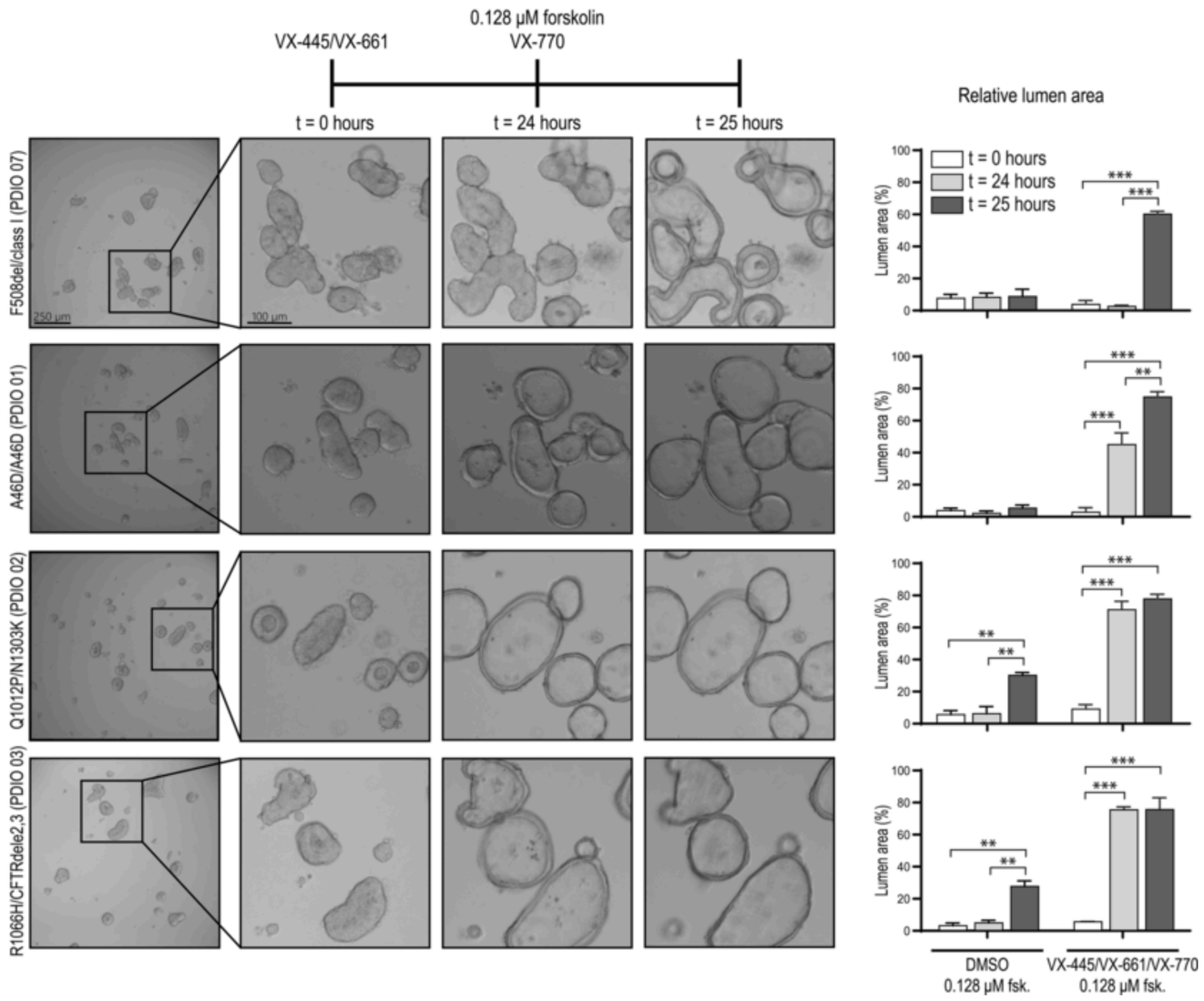

Image from Lefferts et al., 2024. Communications Biology. CC BY 4.0.

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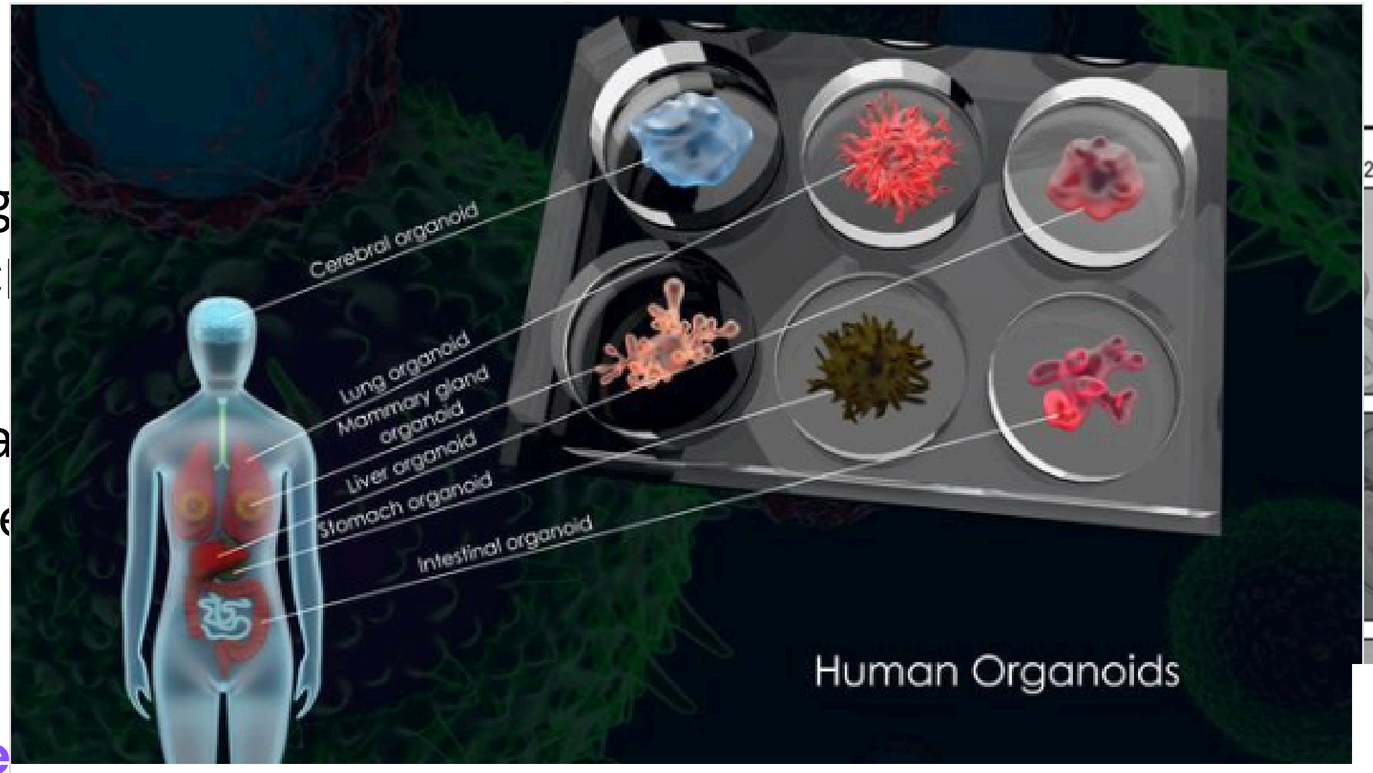
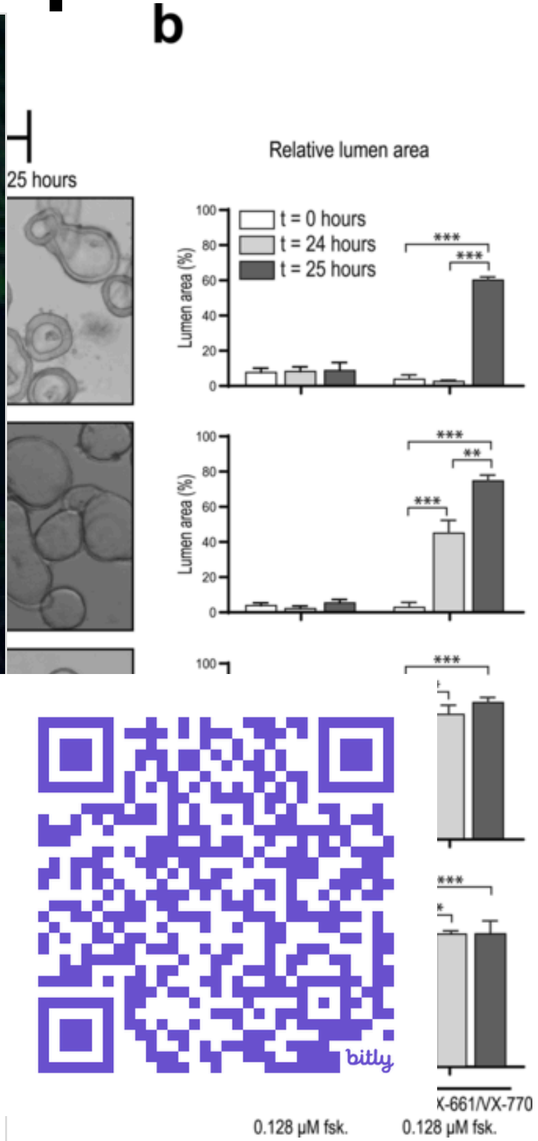


An Introduction to Organoids, Organoid Creation, Culture and Applications

Organoids have revolutionized biological and medical research and proven to be excellent substitutes for animal models in preclinical studies. Here, we discuss what organoids are and how they have been...

TN Cell Science from Technology Networks



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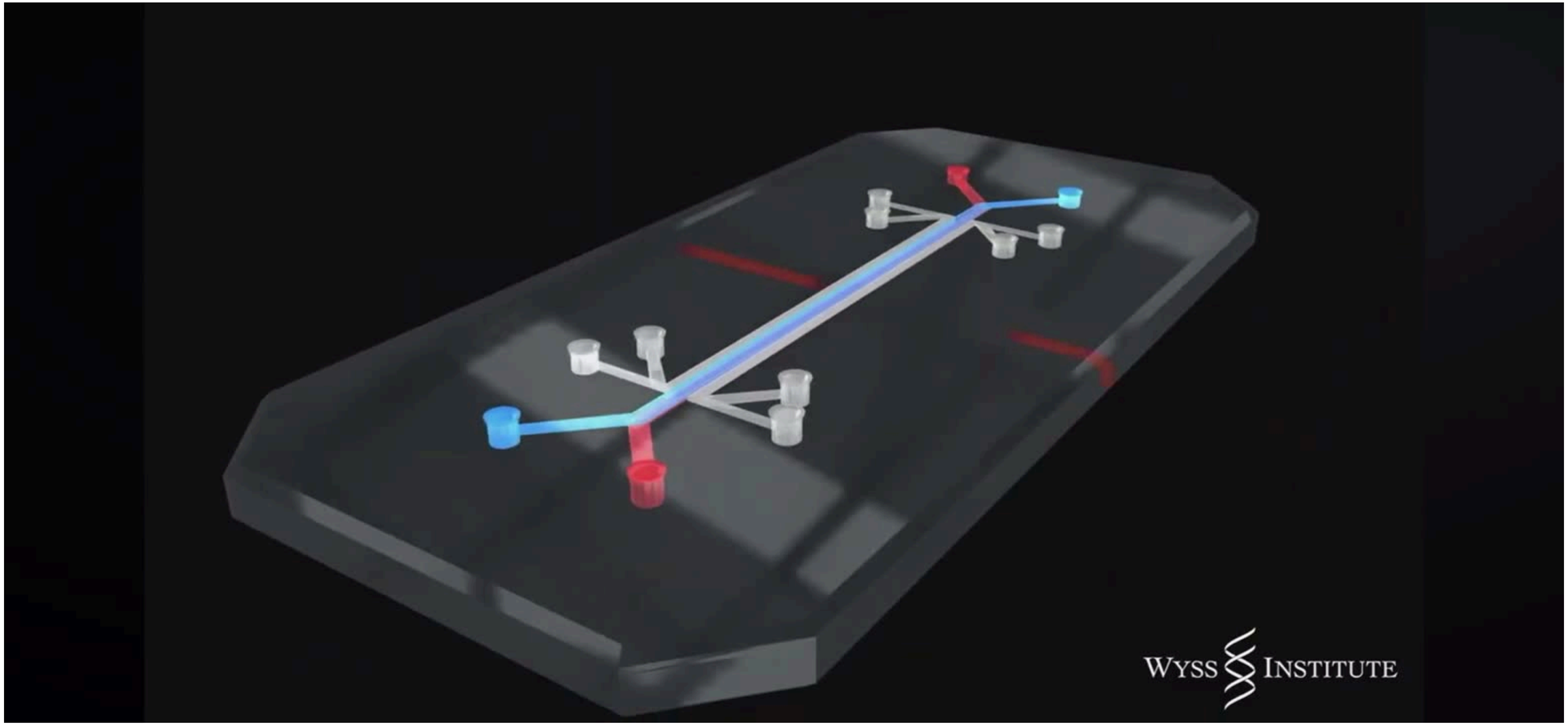
Organ-On-a-Chip



Geraldine Hamilton: Body parts on a chip - TED Talk (2013)
https://www.youtube.com/watch?v=CpkXmtJOH84&t=175s

Organ-on-a-Chip in Action: Validated and Accepted

Use Case	Real-World Result	Recognised By
Liver-on-a-Chip	Predicted *troglitazone* toxicity missed in animals	FDA (used in safety evaluations)
Lung-on-a-Chip	Simulated inhaled drug effects under breathing motion	FDA (via Wyss/Emulate collaborations)
Multi-Organ Systems	Showed accurate systemic drug interactions & metabolism	NCATS, EMA, pharma R&D pipelines

Ewart *et al.*,2022

OMICS and AI:
Powerful Tools That Accurately Predict, Not Guess

OMICS

A collection of disciplines in biology:

- These include genomics, transcriptomics, proteomics, metabolomics, and others.

Structure, Function, Dynamics

OMICS CASE STUDY: FASIGLIFAM — HIDDEN TOXICITY REVEALED

Gene Expression

↓

Transcriptomics

Drug: Fasiglifam (diabetes treatment candidate)
Tool: High-throughput transcriptomics in human liver cells
Outcome:

- Detected an early marker of liver injury
- Animal studies missed this toxicity
- Confirmed in human clinical trials, where patients developed liver damage

Nature Portfolio (2021)

AI Toxicity Predictions eliminating animal testing

Machine learning models are increasingly used to predict chemical toxicity as an alternative to animal testing.

In recent years, projects like the NIH Tox21 programme have spurred the development of AI systems (e.g. DeepTox) that showed high accuracy in toxicity screening assays

AI Toxicity Prediction : Accurate, Sensitive and Reproducible

Model	What It Tested	Results	Why It Matters
RASAR (AI model)	9 major toxicity endpoints incl. skin/eye irritation, acute toxicity	87% accuracy vs. ~81% reproducibility in animal tests 89% sensitivity vs. 69% for animals	AI outperformed animals in detecting toxic substances — across endpoints that account for over half of all animal use in tox testing

Based on Luechtefeld et al., Toxicological Sciences (2018) and Johns Hopkins review

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Based on Luechtefeld et al., Toxicological Sciences (201

This isn't an upgrade — it's a correction. Animal tests were never accurate enough to begin with.

The Real Bottleneck? Validation Itself

Validation still compares to animal results

Animal tests are not human-relevant

We need fit-for-purpose, human-centered validation

“Hartung (2024): Validation should assess mechanistic relevance and human predictive value — not outdated animal concordance.”

Validation must evolve — not just to keep up with science, but to lead it.

1. Fit-for-Purpose Validation

- Replace one-size-fits-all protocols
- Use tiered, modular frameworks based on intended use
- Speed up approval of NAMs already ready for specific areas (e.g., liver toxicity)

2. Use AI and Data Science

- AI can accelerate validation and improve reproducibility
- Supports meta-analysis, prediction across datasets
- Reduces reliance on repetitive, manual (animal-based) comparisons

3. Human-Relevant Evidence

- Prioritise mechanistic understanding over animal mimicry
- Validate NAMs by how well they predict human outcomes
- Use systematic reviews, Bayesian approaches, and omics data to build trust

Hartung, 2024

The Tipping Point: Non Animal Methods Are Already Replacing Animal Research

Bibliometric analysis from 2003 to 2022

7 research areas: breast cancer, lung disease, blood cancer, heart disease, neurodegenerative diseases, diabetes and toxicology

5 regions: USA, China, France, Germany, UK

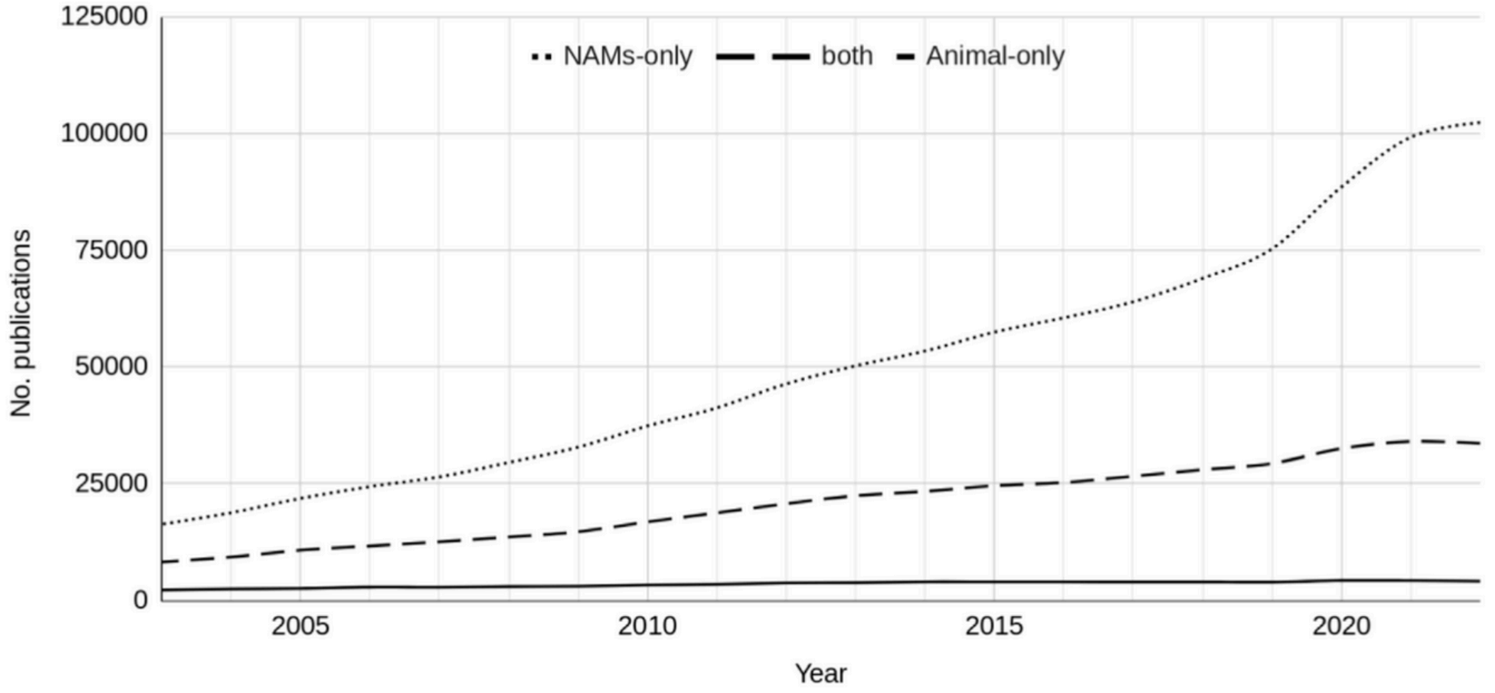

FIGURE 1
The total number of publications from the seven research areas that reported the use of NAMs-only, NAMs and animals and animals-only, between 2003 and 2022.

(Taylor *et al.*, 2024)

The Tipping Point: Non Animal Methods Are Already Replacing Animal Research

High failure rate of drugs through clinical trials, particularly for these disease areas (94.7% cancer, 94.1% neurology, 95.2% cardiovascular and 92.5% for respiratory diseases

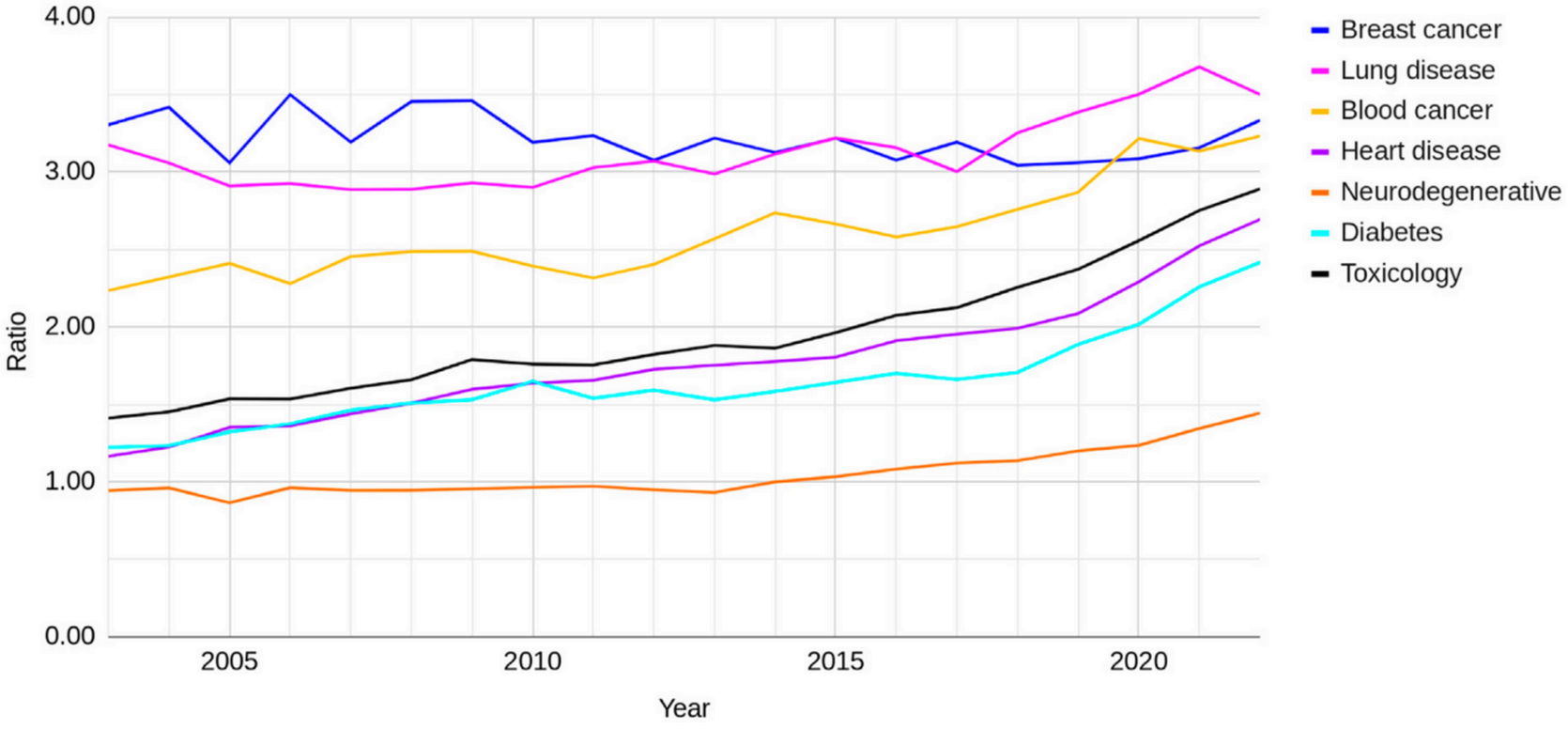

FIGURE 4
The ratio of NAMs-only to animal-based publications for seven research areas between 2003 and 2022.

(Taylor *et al.*, 2024)

The Tipping Point: Non Animal Methods Are Already Replacing Animal Research

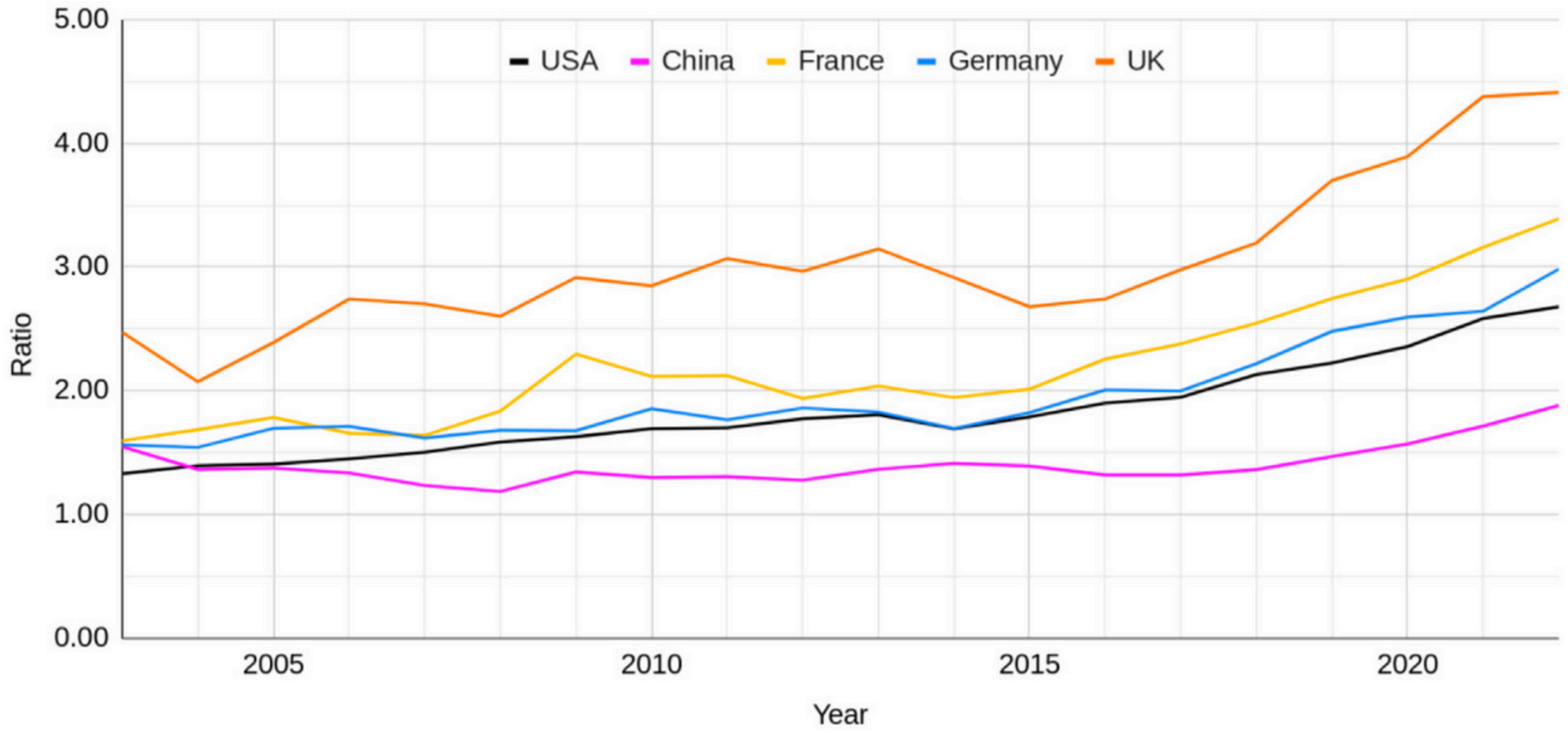

FIGURE 5
The ratio of NAMs-only to animal-based publications across all seven research areas from the USA, China, France, Germany and the United Kingdom between 2003 and 2022.

(Taylor *et al.*, 2024)

So if the science is here — why are we still talking about ‘phasing out’?

Phasing Out Is Not Progress —
It’s Prolonged Harm

Animals are still being bred right now – phasing out doesn’t stop suffering, government licenses still issued.

Delays mean more deaths – both human and animal. Every year of inaction allows avoidable suffering and missed cures - it’s detrimental on scientific and moral grounds for animals and humans.

Government promises change – animals don’t survive politics. UK Government plans? The EPA’s original plan to “phase out” animal tests by 2035 was rolled back with a change in administration.

Legal and illegal exports of animals, especially primates and dogs, continue while our governments stall – every delay fuels demand for more shipments and more suffering.

The rehoming of millions of tortured and in need of recovery animals - where are the plans?

If you’re still breeding, you are not phasing out – you are part of the problem and complicit to the deaths of humans and animals when you know there is a clear animal-free solution.

What You Can Do

❤️ **Support**
Donate, sign petitions, or volunteer to help advance animal-free science.

📲 **Follow**
Instagram: @medicinewithoutcruelty
Bluesky: @medsnotcruelty
Twitter/X: @medsnotcruelty
Facebook: @medicinewithoutcruelty
YouTube: @medicinewithoutcruelty

📢 **Share**
Share this message. Talk to friends, colleagues, and challenge outdated narratives in educational insitutions.

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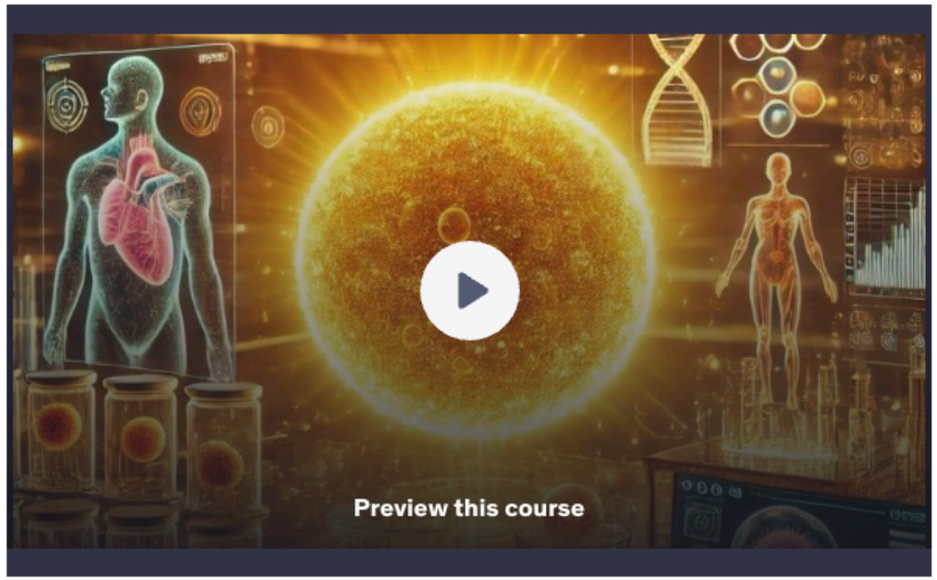
The SUN Project Part 1



Stop & Use Non-animal Methods: SUN Part 1

Learn why need to stop animal testing and adopt non-animal methods today!

Free tutorial 0.0 ☆☆☆☆☆ (0 ratings) 171 students
1hr 23min of on-demand video

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- ✓ Recognise why animal testing must end now
- ✓ Describe the basics of human biology
- ✓ Explain three non-animal methods used in science
- ✓ Apply knowledge of non-animal methods to real-world examples

No more phase-outs. No more delay. End it now — for animal and human life

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