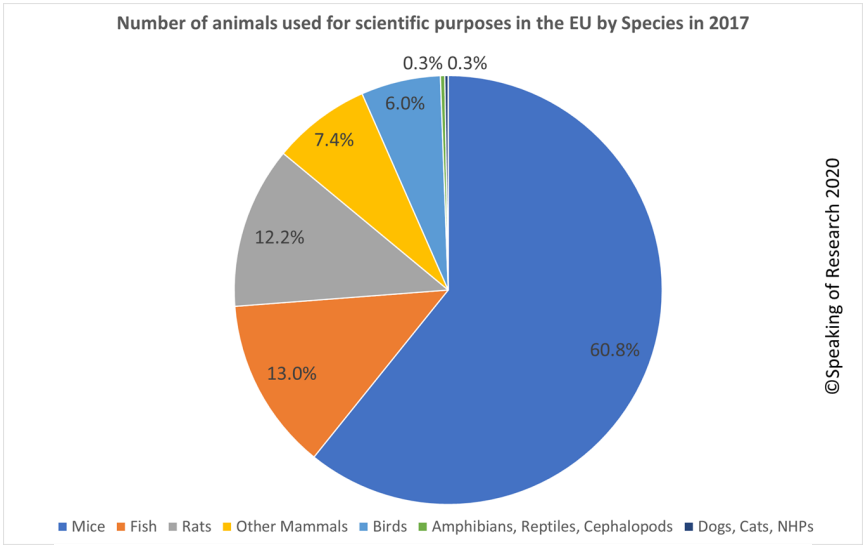
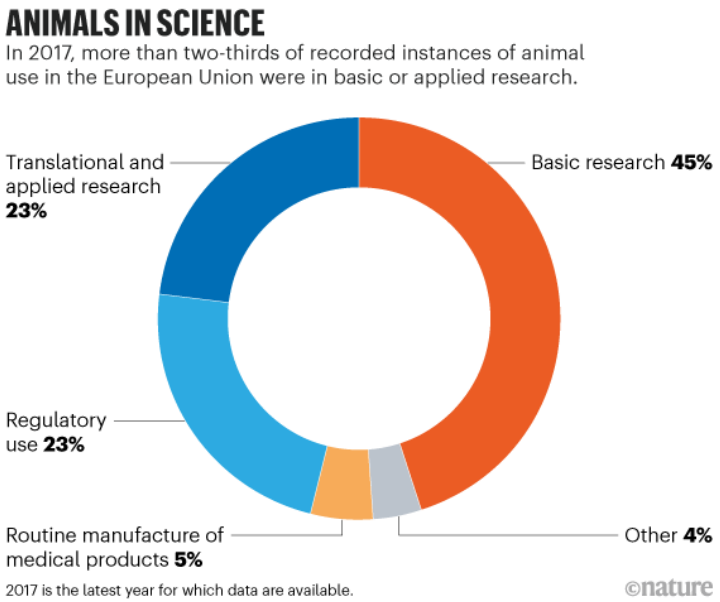
PROMOTION OF NON ANIMALS MODELS (NAMS)

Why are animals used in research?





Pros	Cons
Ease of handling: • Small size • Short reproductive cycle and lifespan • Mild-tempered and docile • Much information available • Possibility for breeding genetically manipulated as model human diseases • Control of the environment • Help to perfect surgical techniques	• Relevance: some substances tested may never be used • Cost: very expensive • Welfare: animals are injured or killed during testing • Alternative methods of testing do not simulate humans in the same way or are not available • Cruelty

Regulatory: regulatory measures to protect animals from harm and ethical considerations surrounding their use in scientific research

https://speakingofresearch.com/2020/02/07/the-eu-publishes-animal-use-statistics-from-2015-2017/
https://images.app.goo.gl/sm1U8pUSEcaXKKni9

Why making the leap to alternatives to animal testing ?

Animal research and testing uses > 100 million animals/year

- Waste production
- Sources of pollution
- Impact on worker's mental health
- Impact on biodiversity

Citizen needs

Regulatory demands

Planetary boundaries

Why making the leap to alternatives to animal testing ?

Animal uses in science

77% of EU citizens want a transition to non-animal science

- 3Rs principles (Russels and Burch, 1959): Replace, Reduce, Refine
- Alternatives to animal testing are the future gold standard

Regulatory demands

Planetary boundaries

Why making the leap to alternatives to animal testing ?

Animal uses in science

Citizen needs

Regulatory demands

- EU Directive 2010/63/EU
- EU Parliament motion to phase out animal testing (2021)
- EC roadmap to phase out animal testing (2023)

Planetary boundaries

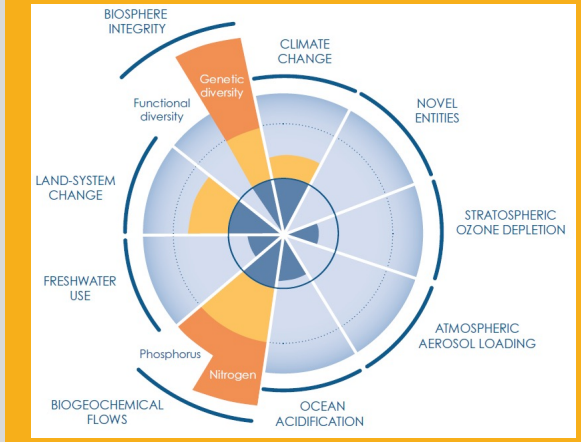
Why making the leap to alternatives to animal testing ?

Animal uses in science

Citizen needs

Regulatory demands

Planetary boundaries



- Need for a better definition of water, biodiversity and natural resources targets
- Petrochemical contribute to climate change
- Green deal with zero pollution action plan for water, soil, air (2019)

What Are the Alternatives?

In vitro

In silico

Non-sentient organisms

What Are the Alternatives?

In vitro

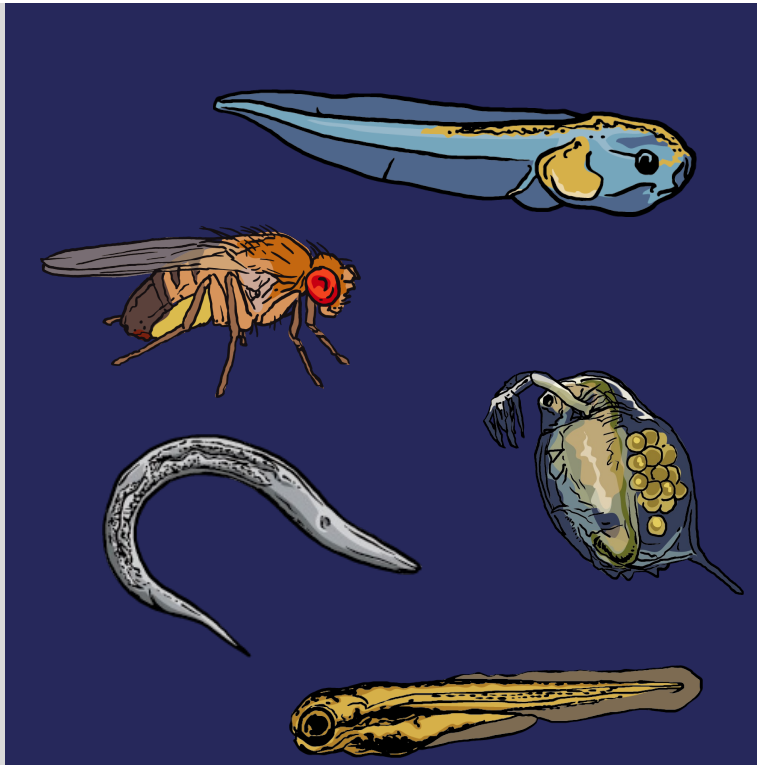
In silico

Non-sentient organisms

What Are the Alternatives?

In vitro

In silico



Non-sentient organisms

Game to design

Code? Open source preferred

Interface? Web preferred

Audience? Public +/- scientific community

Graphic design? No intervention

Presentation? During the hackathon organized by the EU project “ONTOX” (21-23 April 2024)

USE? Science festival, open days, schools/academia

Prize? Participation to the hackathon to present your game with travel and accommodation included


HACK TO SAVE LIVES
AND AVOID ANIMAL
SUFFERING

Hackathon

When? 21-23 April 2024

Where? Utrecht science park; Heidelberglaan 7; 3584 CS, Utrecht; The Netherlands

WHO? community of forward-thinkers and problem-solvers interested in the intersection of AI and ethical toxicology

What? ARTIFICIAL INTELLIGENCE (AI) IN TOXICOLOGY – A POTENTIAL DRIVER FOR REDUCING/REPLACING LABORATORY ANIMALS IN THE FUTURE. WE ARE LOOKING FOR SOLUTIONS AND INNOVATIVE IDEAS TO MOVE FORWARD.

More info: https://ontox-project.eu/hackathon/

Programme

SUNDAY | 21 APRIL 2024

16:00 – 16:30 Reception/registration

16:30 – 16:45 Welcome and practical issues

16:45 – 17:30 Key-note speaker

17:30 – 17:45 Introduction to the "hackathon process"

17:45 – 18:30 Short presentation of the four issues

18:30 – 19:00 Established teams – teambuilding / internal introduction

19:00 – 21:00 Team activities, Icebreaker followed by dinner

MONDAY | 22 APRIL 2024

09:00 – 09:30 Introduction to Day 2

09:30 – 10:15 Key-note speaker

10:15 – 10:30 Coffee break

10:30 – 11:30 Discussion in breakout-groups – the overall theme of the hackathon

11:30 – 12:00 Detailed intro of addressed issues to respective breakout-groups

12:00 – 18:30 Working in breakout-groups on respective issues – breaks for lunch and coffee included

18:30 – 21:00 Icebreaker and dinner

TUESDAY | 23 APRIL 2024

08:00 – 08:30 How to make a nice pitch – communicating your results

08:30 – 10:45 Breakout-groups finalise their presentations

10:45 – 11:00 Coffee break

11:00 – 13:00 Presentations from all breakout-groups

13:00 – 14:00 Lunch and jury evaluation

14:00 – 14:45 Jury moment and award of winner

14:45 – 15:00 Final remarks and sending home

Issue #1: How to drive the use of AI in chemical risk assessment?

EXPLORE CUTTING-EDGE APPROACHES TO ENHANCE THE ROLE OF AI IN ASSESSING CHEMICAL RISKS AND FOSTERING SAFER ENVIRONMENTS

- Approximately 20 000 **chemicals** are registered in the EU under the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) → number and exposition will increase in the future → health effects ?
- The present modus operandi for testing chemicals is not sufficient to secure European citizens' better protection from chemicals in the future → Use of **AI** but transparency in the algorithms ? explainability /confidence in the models? compliance with regulation ?
- Solutions for sharing **data** (big data) + industrial **intellectual property** rights (IPR) ?

Issue #2: To predict or protect?

DELVE INTO THE BALANCE BETWEEN PREDICTIVE CAPABILITIES AND PROTECTIVE MEASURES WHEN IT COMES TO HUMAN HEALTH AND ENVIRONMENTAL WELL-BEING

- Toxicological testing are **hazard-oriented** → Intended use ? Applications ? Probability of adverse outcomes ?
- Current safety assessment of chemicals aims to **predict a potential toxic effect** on humans or in the environment based on the characteristics and properties of a chemical → personal exposition?
- No exposure, no risk → reduction of the number of tests to predict the toxicity of chemicals for **specific applications** ?
- High level of certainty + low probability of exposure → minimal **risk** for that specific chemical in that specific application ?
- Low level of uncertainty + high probability of exposure to a toxic substance → high risk + risk management **strategy**?
- Exposure + high **uncertainty** → more testing ?
- Absence of **evidence** of no risk is not evidence of a risk → How to prove the absence of something that is absent?

Issue #3: How can we secure human health and environmental protection at the same time?

DISCUSS STRATEGIES FOR ACHIEVING DUAL OBJECTIVES—ENSURING HUMAN HEALTH AND SAFEGUARDING THE ENVIRONMENT—THROUGH INNOVATIVE TECHNOLOGIES AND PRACTICES

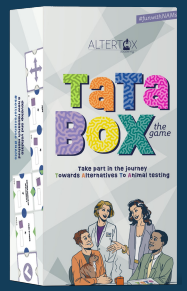
- EU wants to be the first climate-neutral contingent = protection of the environment + ensure healthy food, safe and sustainable transport, energy, and industry → strategy ?
- Health vs environmental protection : opposing interests or converging objectives ? What to prioritize ? How to mitigate ?

Issue #4: How can we facilitate the transition from animal tests to full implementation of human-relevant methods?

EXPLORE METHODS AND IDEAS TO ACCELERATE THE TRANSITION FROM TRADITIONAL ANIMAL TESTING TO MORE HUMAN-RELEVANT AND ETHICAL APPROACHES

- EU **Citizens' Initiative** "Save cruelty-free cosmetics – commit to a Europe without animal testing" has put pressure on EU Commission to accelerate the implementation of non-animal and human-relevant testing of chemical substances in the future.
- **Scepticism** related to new approach methodologies (NAMs) + Artificial Intelligence (AI) + models with human cell culture (*in vitro* test methods) + computer-simulated models (*in silico* test methods) but traditional laboratory test using living animals (*in vivo* test methods) have similar uncertainties + several examples of diseases caused by chemical exposure specific for respective species → strategy for transition to NAMs?
- The present traditional testing capacity is insufficient and acceptance of using animals for testing decreases → How to secure a better **protection** of European citizens from all existing and new chemicals in the future?
- The present regulations require an increased number of animal studies before chemicals are approved for use in specific applications (pharma, food, cosmetics, biocides, etc.) + NAMs, are only fully accepted in relatively few areas + regulatory authorities required **validation of NAMs** (benchmark with in vivo studies) → Implementation of NAMs by industry is driven by full acceptance by regulatory authorities?

“Inspiring innovation
and collaboration around
New Approach Methodologies (NAMs)”



How TaTaBoX Address the Challenge of NAMs?

INCEPTION

- Translate Altertox 10 years know-how on 1 support
- Generate unique experience

OBJECTIVES

- Opening conversations about NAMs
- Edutainment game
- Create a fun and convivial environment

Key Features

- Interactive gameplay
- Educational content
- Collaborative challenges
- Real-world problem-solving

Benefits

- Inspires innovation
- Encourages collaboration
- Fosters critical thinking
- Raises awareness about NAMs
- Makes learning engaging, efficient and enjoyable

Education / trainings

Dive into the Ecosystem of NAMs

TaTaBoX

Embody a Real Actor

Play with 52 Real Scientific Actions

1 Tile

1 Scientific Action

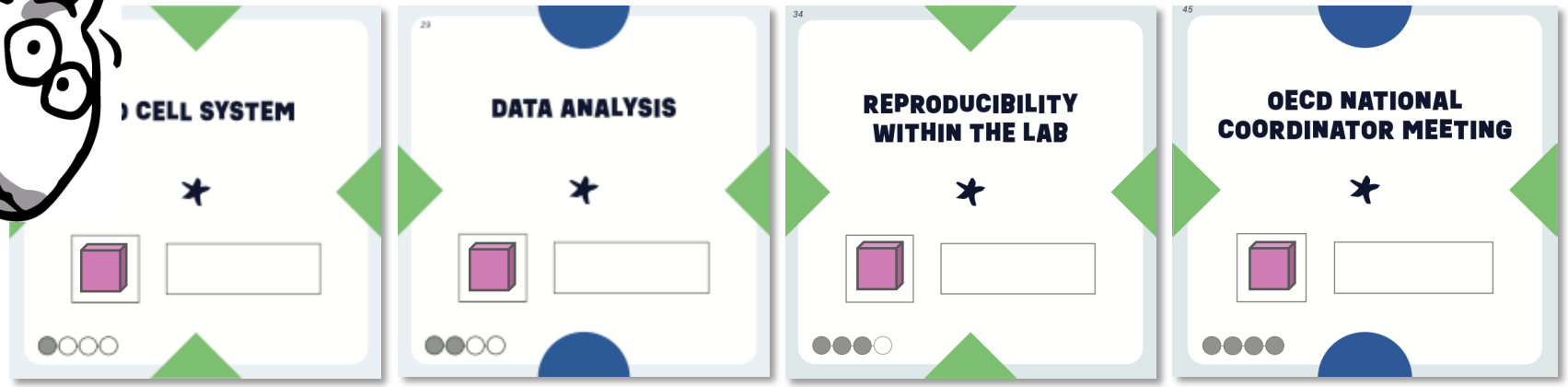
1 Definition

Education / trainings

Gameplay

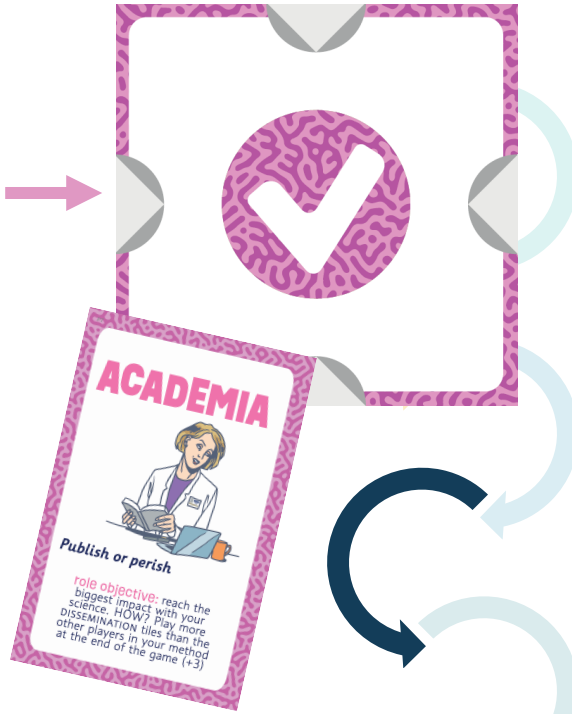
TaTaBoX

Connect the tiles



Step 1 Step 2 Step 3 Step 4

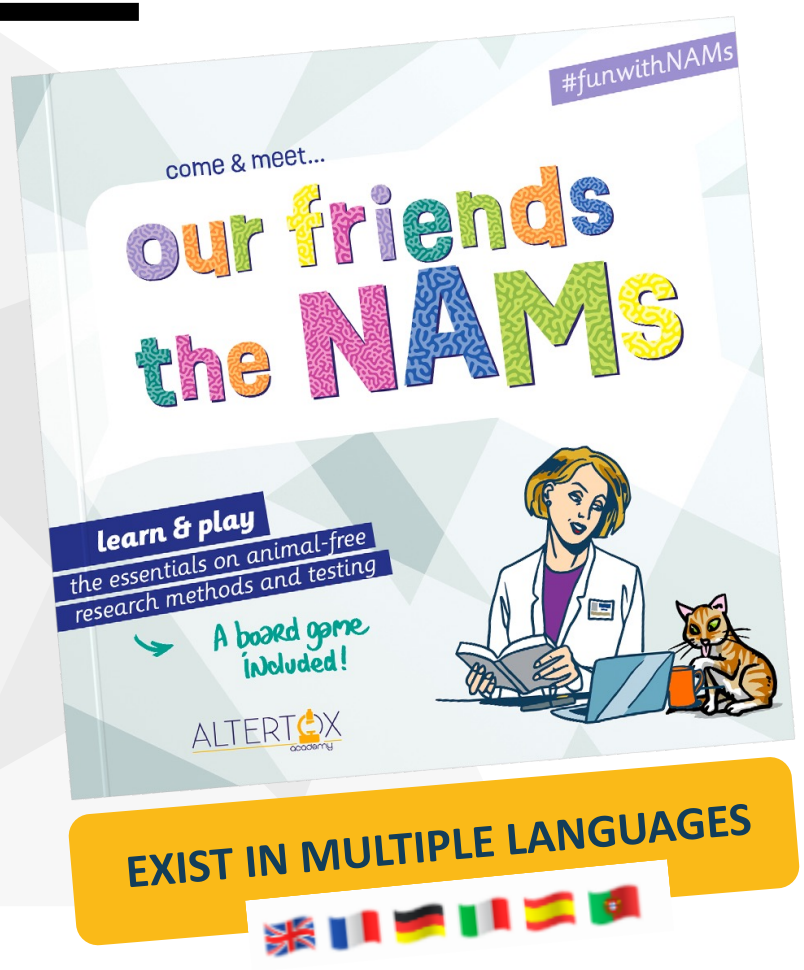
Validation



1 connection
= 1 animal saved
= 1 point

Education / trainings

Public Outreach - Our friends the NAMs



What is "Our friends the NAMs"?

- Complex scientific content translated in layman term using *crosswords, Find the 10 Differences, labyrinth and comics etc*...as dissemination format
- Dedicated to general public from **primary school onward**

Ideal for communicating to a general public

- Perfect for open days (families or schools) and communication kits
- Portrait of Influential Scientists and Discover Their Contributions to NAMs

Customize your science content for your target audience

- **Altertox** translates your science in an engaging manner
- **Altertox** supports you in the design, layout, and images to match your presentation style, online content with QR code

Public outreach

Public Outreach - Little genius

EXIST IN MULTIPLE LANGUAGES

What is “Little Genius”?

- Complex scientific content translated in layman term as a quiz game
- Dedicated to general public from **secondary school onward**

Ideal for communicating to a general public

- Perfect for open days (families or schools) and communication kits
- Introduce scientific themes e.g. life sciences, toxicology, EU policy, EU research projects output… through a fun and engaging activity
- It is composed of 12 questions per scientific theme with two levels of difficulties (kid & adult)

Customize your science content for your target audience

- Altertox translates your science in an engaging manner
- Altertox supports you in the design, layout, and images to match your presentation style, online content with QR code

Public outreach