Lip service, or real improvement? Using guidelines interactively on the path to better science

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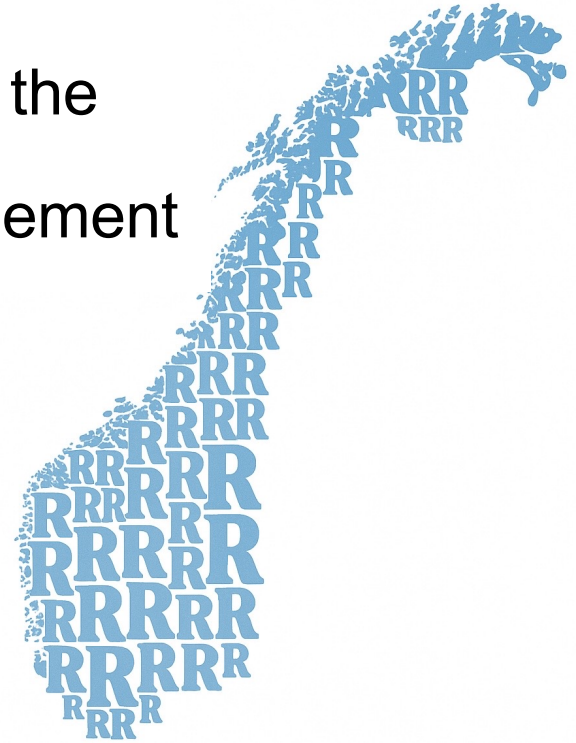
norecopa.no/CELASC

Norecopa

Norway's National Consensus Platform for the

Three Rs: Replacement, Reduction and Refinement

norecopa.no: 11,000 webpages
>1,000 hits a day
6-7 detailed newsletters a year
PREPARE planning checklist in 38 languages



https://norecopa.no

founded 2007

2027

Norecopa: PREPARE for better Science

What is better science?

- ✓ Replacement if possible
- ✓ Reduction and Refinement if not possible to replace
- ✓ Valid data (a true treatment effect)
- ✓ Reproducible and Translatable experiments
- ✓ Best possible animal welfare
- ✓ Health & Safety (of animals and people)
- ✓ Culture of Care at the animal facility
- ✓ Communication of best practice to others





Ignorance of ways to achieve these creates bad science

colourbox.com

Topics in 15 minutes 😳

- Are scientists merely paying lip service?
- How can we encourage them to use guidance from day one of planning?
- What does Norecopa offer?
- Can we use AI to improve the situation?

Disclosures

- Editor of the Norecopa website
- Lead author of the PREPARE guidelines for planning animal studies
- First time ever: Some of the text in this presentation was composed by ChatGPT, as part of a study to test its usefulness in improving compliance

The pathway to open (better) science

Norecopa: PREPARE for better Science

https://riojournal.com/article/105198

Norecopa: PREPARE for better Science

https://nrkbeta.no/2010/09/28/mediebransjens-svar-paa-elg-i-solnedgang

Norecopa: PREPARE for better Science

https://nrkbeta.no/2010/09/28/mediebransjens-svar-paa-elg-i-solnedgang

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My project has been funded, and the method has been published before, so why should I change the protocol?

“We followed the PREPARE and ARRIVE guidelines...”

Meta-research studies show that:
87% of papers still failed to report randomisation
86% failed to report blinding
Sample-size calculations are often absent (Leung et al., 2018; Song et al., 2023)

Merely requesting ARRIVE checklists during manuscript submission did not substantially improve compliance (Hair, Macleod & Sena, 2019)

Laboratory Animals
Volume 58, Issue 2, April 2024, Pages 109-115

https://doi.org/10.1177/00236772231181658

Sage Journals

Review Article

Twelve years after the ARRIVE guidelines: Animal research has not yet arrived at high standards

Junmin Song[1,*], Marco Solmi[2,3,4,5,6], Andre F Carvalho[7], Jae Il Shin[8,9,10], and John PA Ioannidis[11]

Hair *et al. Research Integrity and Peer Review* (2019) 4:12
https://doi.org/10.1186/s41073-019-0069-3

Research Integrity and Peer Review

RESEARCH Open Access

A randomised controlled trial of an Intervention to Improve Compliance with the ARRIVE guidelines (IICARus)

Kaitlyn Hair, Malcolm R. Macleod, and Emily S. Sena*, on behalf of the IICARus Collaboration

RESEARCH ARTICLE

ARRIVE has not ARRIVEd: Support for the ARRIVE (Animal Research: Reporting of *in vivo* Experiments) guidelines does not improve the reporting quality of papers in animal welfare, analgesia or anesthesia

Vivian Leung, Frédérik Rousseau-Blass, Guy Beauchamp, Daniel S. J. Pang*

Faculty of Veterinary Medicine, Université de Montréal, Saint-Hyacinthe, Québec, Canada

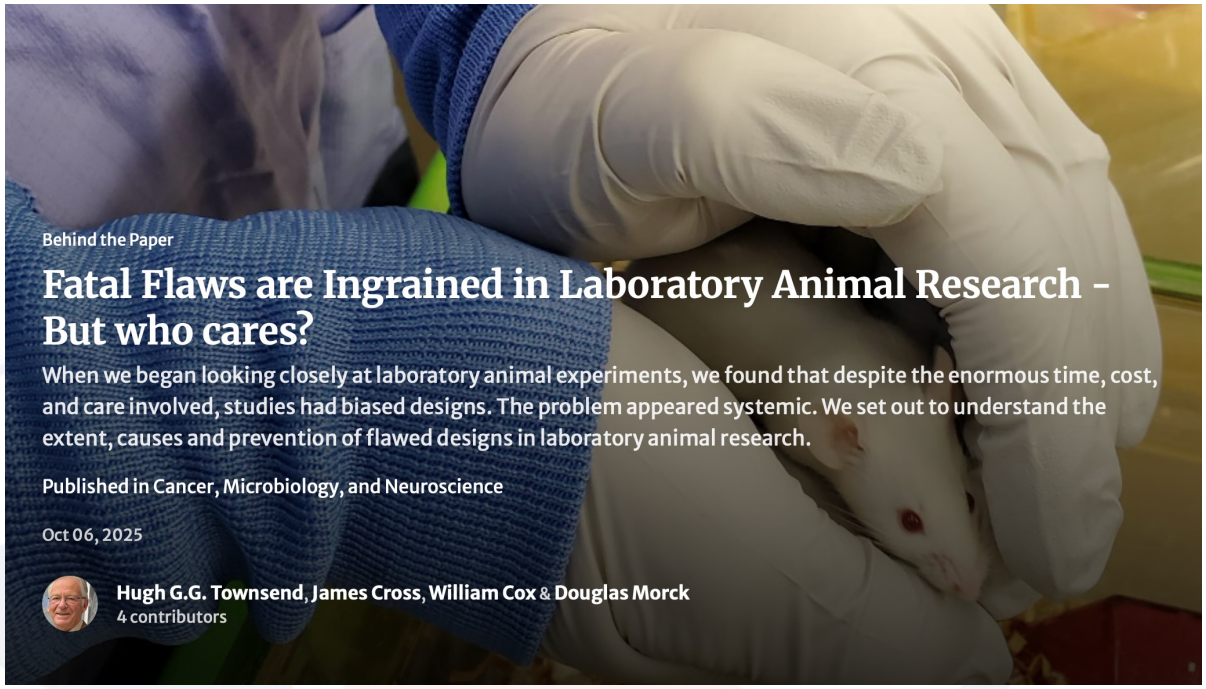
Norecopa: PREPARE for better Science

Article | Open access | Published: 21 August 2025

A call to action to address critical flaws and bias in laboratory animal experiments and preclinical research

Hugh G. G. Townsend ✉, Klaus Osterrieder, Murray D. Jelinski, Douglas W. Morck, Cheryl L. Waldner, William R. Cox, Volker Gerdts, Andrew A. Potter, Lorne A. Babiuk & James C. Cross

Scientific Reports **15**, Article number: 30745 (2025) | Cite this article



https://communities.springernature.com/posts/fatal-flaws-are-ingrained-in-laboratory-animal-research-but-who-cares

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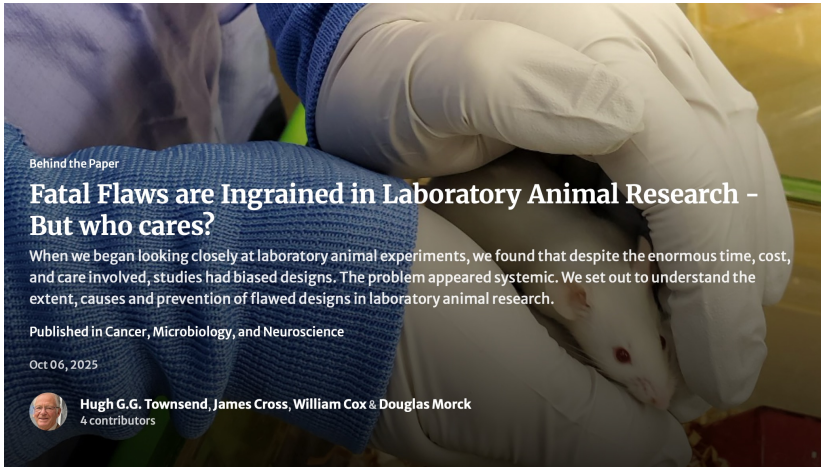
'Not even one followed the principles of rigorous experimental design'

Our paper, however, focuses specifically on the four fatal flaws that compromise the validity of most, if not all, laboratory animal experiments. If these flaws—related to failures in full randomization, full blinding, control of cage effect, and the use of the correct unit of analysis—are not rigorously addressed at the design and analysis stages, the resulting data are inherently unreliable and cannot support valid statistical inference.

Given the opportunity, we will strongly recommend that funding agencies verify that these core design elements are in place *before* a study proceeds to peer review. Without this foundation, even the best-intentioned initiatives such as PREPARE and ARRIVE cannot ensure that results will be credible, repeatable, reproducible and translatable to human and veterinary medicine.



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I have seen several presentations on this very topic at the American Association for Laboratory Animal Science national meeting. I attend this meeting because I have an interest in animal welfare. However, I wonder how many investigators make up the audience at this meeting. It is primarily aimed at facility care staff/managers and veterinarians/vet techs. Is this topic presented at other meetings? For instance, since this study data consisted of vaccine research, will this be presented at vaccine/immunology conferences? Do you plan to review work in other fields and potentially present at other conferences? In general I don't think this message is getting to the right audience. Hopefully this publication is a step in the right direction.

https://communities.springernature.com/posts/fatal-flaws-are-ingrained-in-laboratory-animal-research-but-who-cares

felasa2025
June 2–5
Athens, Greece

Session
E - Aiming for a Better Future
Trianti

Monday, June 2, 10:15 – 11:30

S2E3 'You All Shouldn't Be Here!' – How to Burst the 3R Bubble

felasa2025.eu

Neuroscience and immunology account for more than 20% of all animals used in Europe

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20,000 participants

fourwaves.com/blog/how-to-make-a-scientific-poster

Experiments were performed on spontaneously breathing adult male Wistar rats (anesthetized with sodium thiopentone 100 mg/kg i.p.). Two trephinations were made over the left parieto-occipital cortex, the dura mater was opened, and the exposed brain areas were superfused with regular artificial cerebrospinal fluid (ACSF, warmed to

Germany

no mention of analgesia

fourwaves.com/blog/how-to-make-a-scientific-poster

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Guidelines for the reporting of anaesthesia and analgesia in poster presentations of surgical research

PCOS for 21 days. Exercise groups were trained for 38 min/day five days a week for 12 weeks. After experimental protocol, thoracotomy was performed under 50 mg/kg sodium thiopental anesthesia. HOMA-IR, FSH, LH, thiol levels were analyzed in blood. Myokines were analyzed in

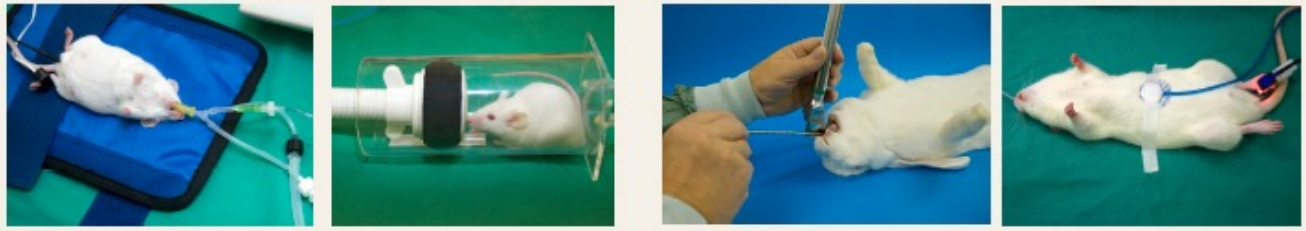
Turkey

no mention of analgesia

"Poor reporting does not necessarily mean poor practice..."
but these drug choices suggest an underlying problem

norecopa.no/R3FINED

Anaesthesia and Analgesia in Laboratory Animals: When Will Best Practice Become Standard?



RAT RESEARCH ANIMAL TRAINING

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PREPARE for better Science

R3FINED INTERNATIONAL Ltd

Prof. Paul Flecknell · Research Animal Training (RAT)

1

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The pathway to open (better) science

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https://riojournal.com/article/105198

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PREPARE

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The PREPARE Guidelines Checklist

Planning Research and Experimental Procedures on Animals: Recommendations for Excellence

Adrian J. Smith[a], R. Eddie Clutton[b], Elliot Lilley[c], Kristine E. Aa. Hansen[c] & Trond Brattelid[d]

[a]Norecopa, c/o Norwegian Veterinary Institute, P.O. Box 750 Sentrum, 0106 Oslo, Norway; [b]Royal (Dick) School of Veterinary Studies, Easter Bush, Midlothian, EH25 9RG, U.K.; [c]Research Animals Department, Science Group, RSPCA, Wilberforce Way, Southwater, Horsham, West Sussex, RH13 9RS, U.K.; [d]Section of Experimental Biomedicine, Department of Production Animal Clinical Sciences, Faculty of Veterinary Medicine, Norwegian University of Life Sciences, P.O. Box 8146 Dep., 0033 Oslo, Norway; [e]Division for Research Management and External Funding, Western Norway University of Applied Sciences, 5020 Bergen, Norway.

PREPARE[1] consists of planning guidelines which are complementary to reporting guidelines such as ARRIVE[2].
PREPARE covers the three broad areas which determine the quality of the preparation for animal studies:

1. **Formulation of the study**
2. **Dialogue between scientists and the animal facility**
3. **Quality control of the components in the study**

The topics will not always be addressed in the order in which they are presented here, and some topics overlap. The PREPARE checklist can be adapted to meet special needs, such as field studies. PREPARE includes guidance on the management of animal facilities, since in-house experiments are dependent upon their quality. The full version of the guidelines is available on the Norecopa website, with links to global resources, at **https://norecopa.no/PREPARE**.
The PREPARE guidelines are a dynamic set which will evolve as more species- and situation-specific guidelines are produced, and as best practice within Laboratory Animal Science progresses.

Topic	Recommendation
(A) Formulation of the study	
1. Literature searches	☐ Form a clear hypothesis, with primary and secondary outcomes. ☐ Consider the use of systematic reviews. ☐ Decide upon databases and information specialists to be consulted, and construct search terms. ☐ Assess the relevance of the species to be used, its biology and suitability to answer the experimental questions with the least suffering, and its welfare needs. ☐ Assess the reproducibility and translatability of the project.
2. Legal issues	☐ Consider how the research is affected by relevant legislation for animal research and other areas, e.g. animal transport, occupational health and safety. ☐ Locate relevant guidance documents (e.g. EU guidance on project evaluation).
3. Ethical issues, harm-benefit assessment and humane endpoints	☐ Construct a lay summary. ☐ In dialogue with ethics committees, consider whether statements about this type of research have already been produced. ☐ Address the 3Rs (replacement, reduction, refinement) and the 3Ss (good science, good sense, good sensibilities). ☐ Consider pre-registration and the publication of negative results. ☐ Perform a harm-benefit assessment and justify any likely animal harm. ☐ Discuss the learning objectives, if the animal use is for educational or training purposes. ☐ Allocate a severity classification to the project. ☐ Define objective, easily measurable and unequivocal humane endpoints. ☐ Discuss the justification, if any, for death as an end-point.
4. Experimental design and statistical analysis	☐ Consider pilot studies, statistical power and significance levels. ☐ Define the experimental unit and decide upon animal numbers. ☐ Choose methods of randomisation, prevent observer bias, and decide upon inclusion and exclusion criteria.

Topic	Recommendation
(B) Dialogue between scientists and the animal facility	
5. Objectives and timescale, funding and division of labour	☐ Arrange meetings with all relevant staff when early plans for the project exist. ☐ Construct an approximate timescale for the project, indicating the need for assistance with preparation, animal care, procedures and waste disposal/decontamination. ☐ Discuss and disclose all expected and potential costs. ☐ Construct a detailed plan for division of labour and expenses at all stages of the study.
6. Facility evaluation	☐ Conduct a physical inspection of the facilities, to evaluate building and equipment standards and needs. ☐ Discuss staffing levels at times of extra risk.
7. Education and training	☐ Assess the current competence of staff members and the need for further education or training prior to the study.
8. Health risks, waste disposal and decontamination	☐ Perform a risk assessment, in collaboration with the animal facility, for all persons and animals affected directly or indirectly by the study. ☐ Assess, and if necessary produce, specific guidance for all stages of the project. ☐ Discuss means for containment, decontamination, and disposal of all items in the study.
(C) Quality control of the components in the study	
9. Test substances and procedures	☐ Provide as much information as possible about test substances. ☐ Consider the feasibility and validity of test procedures and the skills needed to perform them.
10. Experimental animals	☐ Decide upon the characteristics of the animals that are essential for the study and for reporting. ☐ Avoid generation of surplus animals.
11. Quarantine and health monitoring	☐ Discuss the animals' likely health status, any needs for transport, quarantine and isolation, health monitoring and consequences for the personnel.
12. Housing and husbandry	☐ Attend to the animals' specific instincts and needs, in collaboration with expert staff. ☐ Discuss acclimatization, optimal housing conditions and procedures, environmental factors and any experimental limitations on these (e.g. food deprivation, solitary housing).
13. Experimental procedures	☐ Develop refined procedures for capture, immobilisation, marking, and release or rehoming. ☐ Develop refined procedures for substance administration, sampling, sedation and anaesthesia, surgery and other techniques.
14. Humane killing, release, reuse or rehoming	☐ Consult relevant legislation and guidelines well in advance of the study. ☐ Define primary and emergency methods for humane killing. ☐ Assess the competence of those who may have to perform these tasks.
15. Necropsy	☐ Construct a systematic plan for all stages of necropsy, including location, and identification of all animals and samples.

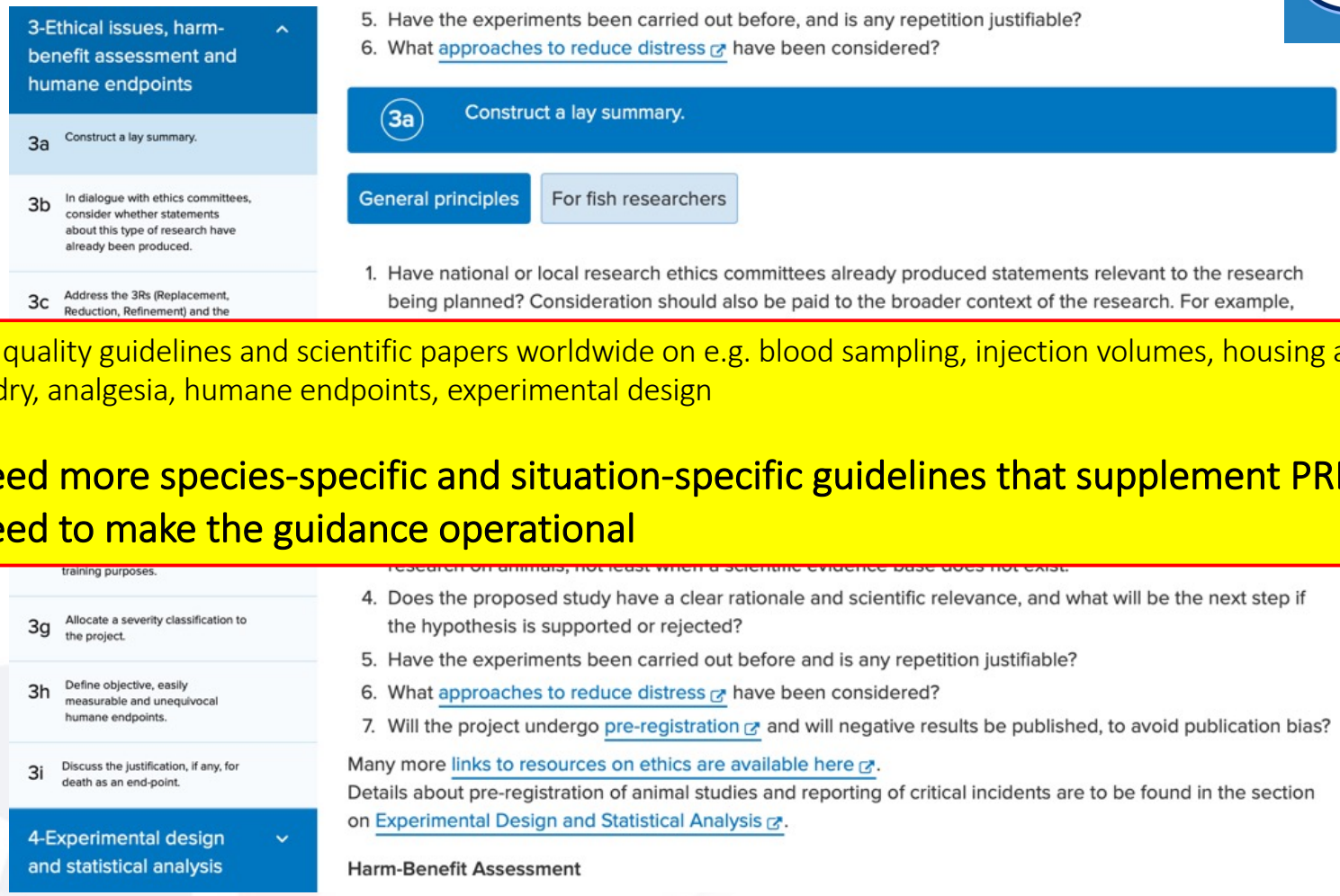
References

1. Smith AJ, Clutton RE, Lilley E, Hansen KEA & Brattelid T. PREPARE:Guidelines for Planning Animal Research and Testing. *Laboratory Animals*, 2017, DOI: 10.1177/0023677217724823.
2. Kilkenny C, Browne WJ, Cuthill IC *et al.* Improving Bioscience Research Reporting: The ARRIVE Guidelines for Reporting Animal Research. *PloS Biology*, 2010; DOI: 10.1371/journal.pbio.1000412.

Further information
https://norecopa.no/PREPARE / *post@norecopa.no* / @norecopa

Norecopa: PREPARE for better Science

norecopa.no/PREPARE



Links to quality guidelines and scientific papers worldwide on e.g. blood sampling, injection volumes, housing and husbandry, analgesia, humane endpoints, experimental design

We need more species-specific and situation-specific guidelines that supplement PREPARE!
We need to make the guidance operational

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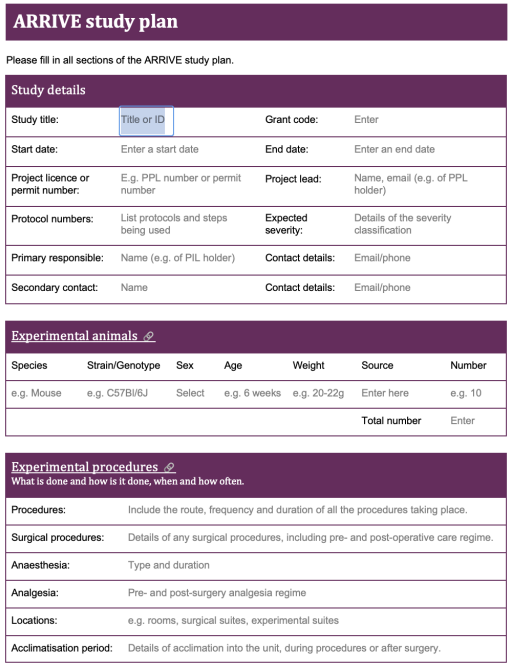
Citing guidelines and publishing in ARRIVE-endorsing journals

is no help without

- fully integrating the principles in PREPARE & ARRIVE:
  - study planning
  - execution
  - transparent reporting

The bottleneck now seems to be lack of implementation, not lack of guidance



ARRIVE study plan

Please fill in all sections of the ARRIVE study plan.

Study details

Study title:	Title or ID	Grant code:	Enter
Start date:	Enter a start date	End date:	Enter an end date
Project licence or permit number:	E.g. PPL number or permit number	Project lead:	Name, email (e.g. of PPL holder)
Protocol numbers:	List protocols and steps being used	Expected severity:	Details of the severity classification
Primary responsible:	Name (e.g. of PIL holder)	Contact details:	Email/phone
Secondary contact:	Name	Contact details:	Email/phone

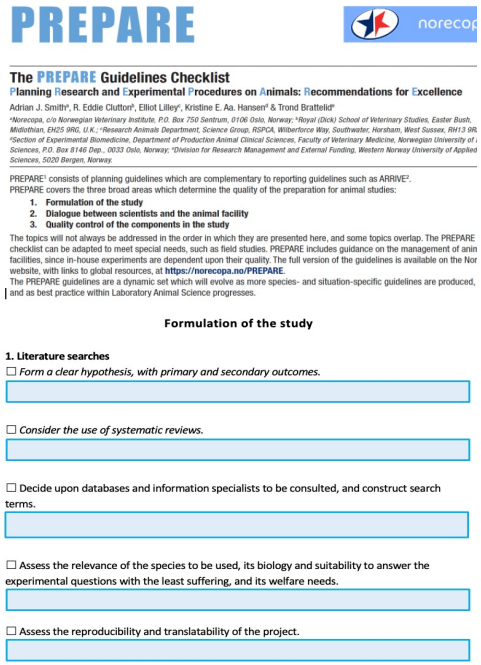
Experimental animals

Species	Strain/Genotype	Sex	Age	Weight	Source	Number
e.g. Mouse	e.g. C57Bl/6J	Select	e.g. 6 weeks	e.g. 20-22g	Enter here	e.g. 10
					Total number	Enter

Experimental procedures

What is done and how is it done, when and how often.

Procedures:	Include the route, frequency and duration of all the procedures taking place.
Surgical procedures:	Details of any surgical procedures, including pre- and post-operative care regime.
Anaesthesia:	Type and duration
Analgesia:	Pre- and post-surgery analgesia regime
Locations:	e.g. rooms, surgical suites, experimental suites
Acclimatisation period:	Details of acclimation into the unit, during procedures or after surgery.



PREPARE

norecop

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☐ Assess the relevance of the species to be used, its biology and suitability to answer the experimental questions with the least suffering, and its welfare needs.

☐ Assess the reproducibility and translatability of the project.

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There are fillable versions of ARRIVE and PREPARE that can be used as Study Plans

https://arriveguidelines.org/resources/study-plan
https://norecopa.no/prepare/prepare-checklist

Enhancing **Q**uality **i**n **P**reclinical **D**ata - Vootele Voikar 0915 today

EQIPD operationalises ARRIVE and PREPARE:

Connects planning, practice and reporting

EQIPD ensures consistency and traceability during study conduct

norecopa.no/3r-guide/eqipd

There is a real risk that guidelines are treated as a compliance ritual, rather than tools to improve science.

The ‘lip service’ problem is driven by

- incentives for novelty, speed and positive results, rather than for rigour, reproducibility and transparency
- checklist fatigue (multiple overlapping requirements from funders, institutional review boards, regulators and journals
- late-stage engagement (at manuscript submission)
- insufficient training in how to use study design to improve validity and translatability
- cultural separation: is LAS seen as regulatory support rather than an intellectual partner?

AI systems can train on

ARRIVE
PREPARE
Resources from 3R centres
FELASA recommendations
Evidence of systematic reviews
Situation- and species-specific guidelines

How could AI help improve the situation?

- For example:
  - ✓ automated detection of missing items in PREPARE and ARRIVE
  - ✓ real-time design feedback
  - ✓ manuscript screening before submission

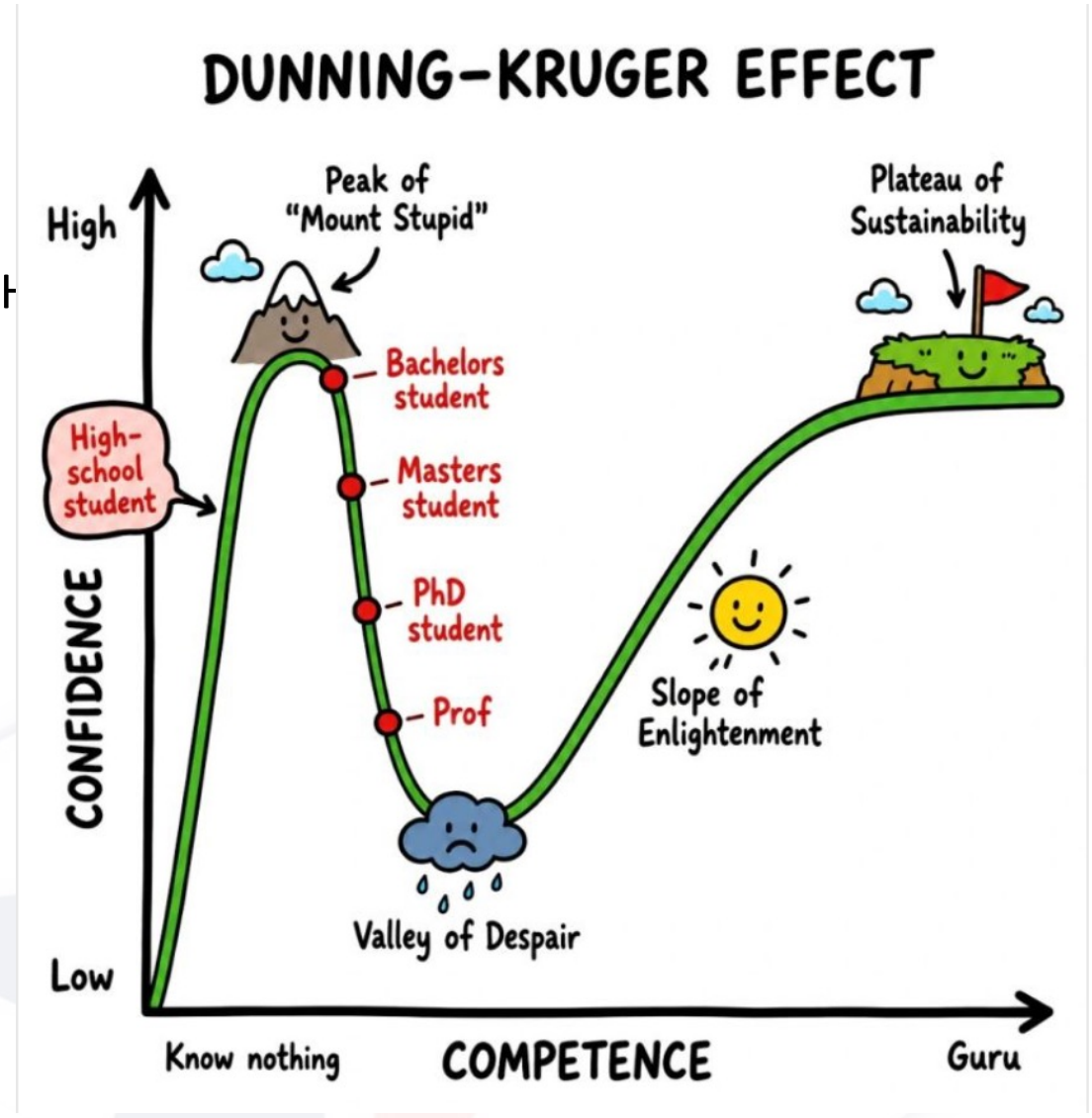
But AI systems must

- be transparent about their sources
- distinguish evidence from opinion
- avoid hallucinations
- preserve human ethical responsibility
- avoid reinforcing poor historical practices

i.e. *AI-assisted expertise*
not *AI-driven decision making*

We need to make experimental design

- ✓ easier
- ✓ earlier
- ✓ more visible
- ✓ more collaborative
- ✓ more intellectually engaging



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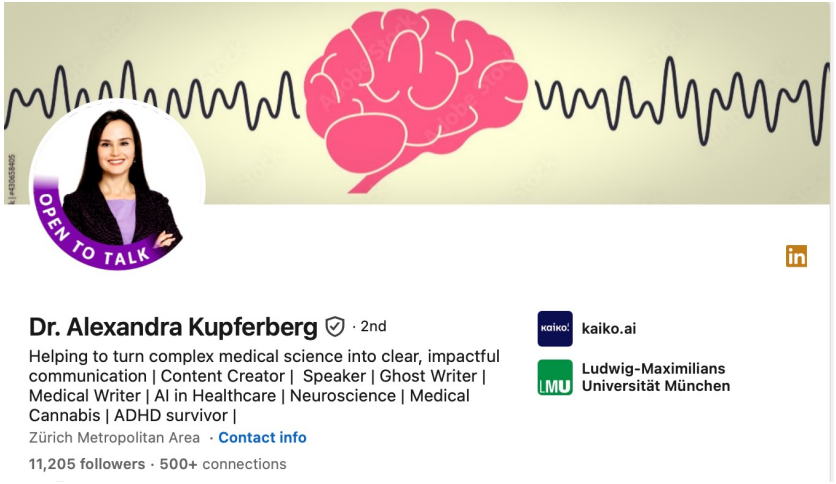


Norecopa: PREPARE for better Science

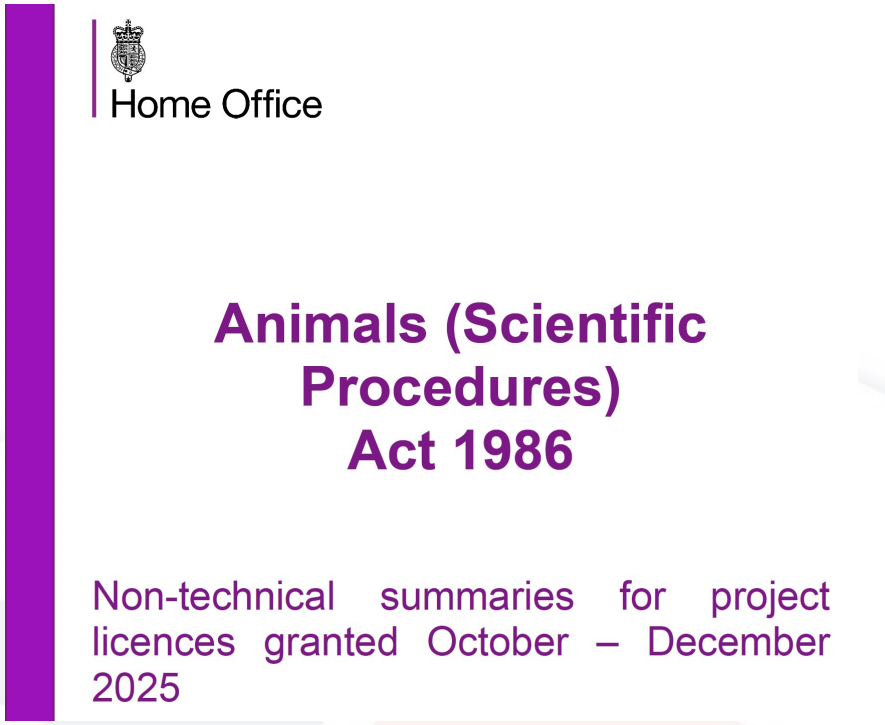
Choose your AI model correctly – not easy in a rapidly developing field

A case in point:

An analysis of the Non-Technical Summaries of projects approved in the UK

The small matter of "hallucination"....

Available as pdf files on the Home Office website


Home Office

Animals (Scientific Procedures) Act 1986

Non-technical summaries for project licences granted October – December 2025

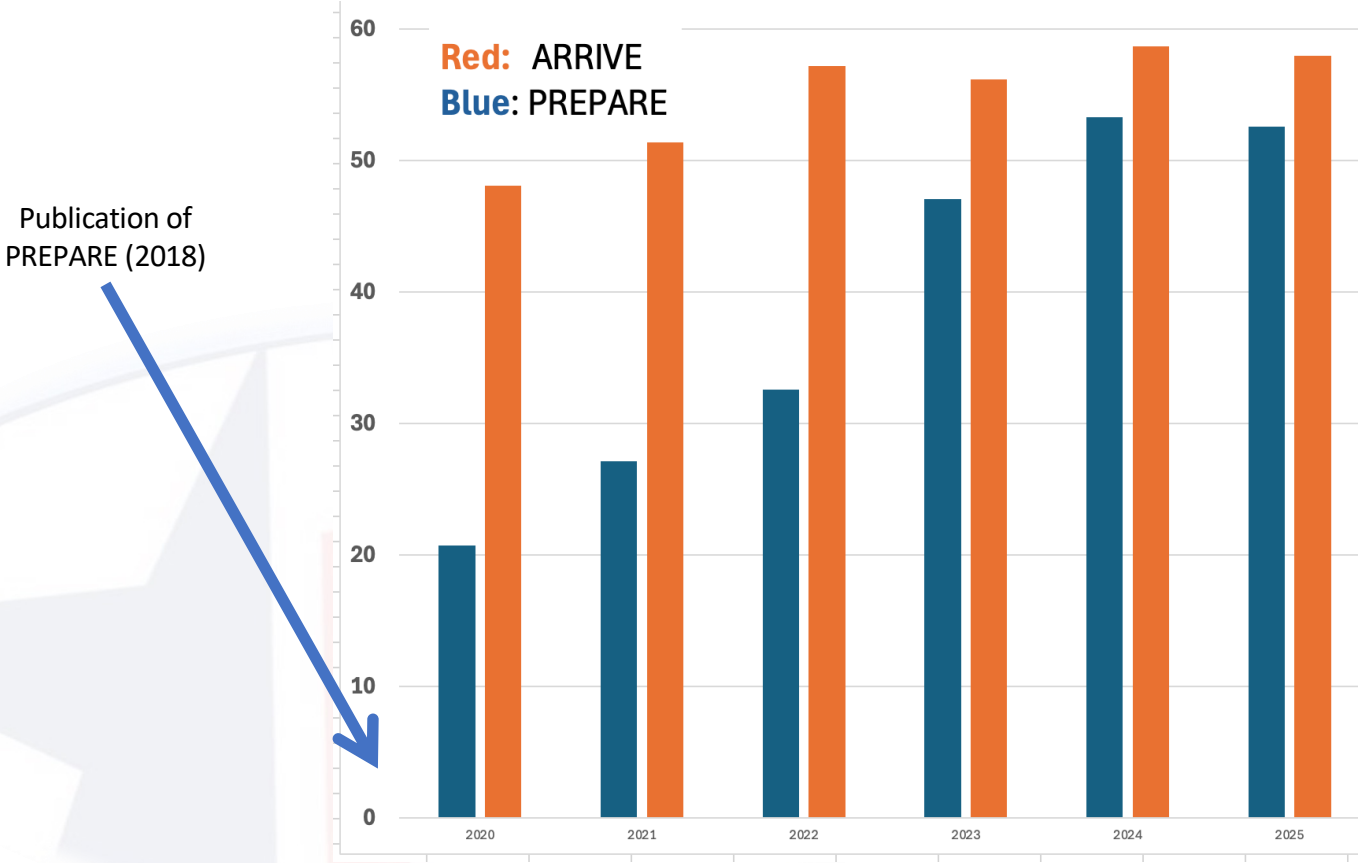

Home Office

1. Table of Contents

1. Basic and translational mechanisms of neurodegeneration 6
2. Delivery of Genetic and Cell Therapies for Respiratory Diseases 16
3. Developing image-guided cancer treatments 23
4. Discovery of novel therapeutics for the treatment of neurodegenerative disease 30
5. Effects of gut-brain signalling on behaviour in health and disease 40
6. Endocrine disrupting chemicals in waterways and the impact on the survival and breeding success of songbirds 48
7. Evaluation of Cardiovascular Devices for Diagnosis or Treatment 57
8. Genetic control of B cell responses and pathology 66
9. Identifying novel strategies to modulate neuroinflammation 73
10. Immune mediated disease and immunomodulation by parasites 82
11. Influenza virus research in animals as models for human disease. 93
12. Information processing in the dementia brain 102

https://www.gov.uk/government/collections/non-technical-summaries-of-projects-granted-under-aspa

Percentage of UK approved projects that cite ARRIVE & PREPARE in their Non-Technical Summaries



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What did AI find?

OK

Using the full text of the uploaded PDF, I found **31 project summaries that explicitly mention "PREPARE"** (usually the Norecopa PREPARE guidelines):

1. Genetic control of B cell responses and pathology
2. Immune mediated disease and immunomodulation by parasites
3. Laboratory Rodent Anaesthesia and Analgesia
4. Mechanisms regulating short and long-lived adaptive immune responses (2025)
5. Mouse models of pancreatic cancer and therapy
6. Regulation of female fertility in health and disease
7. Responsiveness of adult neurogenesis to environmental interventions
8. The host-gut microbiome interface during inflammatory disease
9. Breeding, maintenance and phenotyping of genetically altered mouse models for dementia drug discovery
10. Cerebrovascular function across the lifecourse in health and disease
11. Circadian and visual responses in health and disease
12. Development and plasticity of synapses and networks
13. Genetics of Down Syndrome
14. Inflammation and tissue repair in health and disease: from mechanistic insight to dysfunction and rescue
15. Novel methods for cell type-specific drug delivery
16. Role of Transposable Elements in mammalian development
17. Studying microbial pathogenesis to cure infections
18. The influence of genetic background and husbandry treatments on fish microbiota and gill health during disease and routine husbandry
19. Understanding the regulation of behaviour and physiology by genes and nutrients
20. Unravelling Microbiome and Angiogenesis Networks in Cancer and Beyond
21. Cryopreservation, rederivation, breeding and maintenance as a service
22. Investigating how the interface between metabolic homeostasis and the immune system influences liver cancer development
23. Investigating the biological and therapeutic implications of cell trafficking and ageing in cancer risk, development and progression
24. Macrophages as a cell therapy for inflammatory and fibrotic diseases
25. Metabolism in the immune system
26. Non-clinical toxicology evaluation of therapeutic substances
27. Novel Strategies for Targeted Cancer Immunotherapy and Drug Delivery
28. Physical signals and their interaction with biochemical signalling in vertebrate tissues and cells
29. Physiological and neurobiological functions of the Trappc9 gene in mice
30. Support to provide fish lines
31. Therapeutic approaches and pathophysiolo[illegible]f neuromuscular disorders

but when it converted it into an Excel file

	Project No.	Project Title
2	1	Computational tools: Computational tools will be used to select antigens for inclusion in
3	2	Pilot studies: Small- scale pilot studies will be conducted when introducing new vaccine
4	3	Cryopreservation of mouse tissue: Mouse tissue will be cryopreserved for later use or sharing with collaborators, ensuring that valuable samples are preserved for future
5	4	Collaboration and sample sharing: We will share samples with collaborating groups
6	5	Colony management: We will implement good colony management practices to ensure that only the necessary cohorts are bred for experiments. Breeding data from our mouse
7	6	Global Economies: By reducing disease burden and minimizing the economic impact of outbreaks, better vaccines can contribute to a more stable workforce and reduce
8	7	Vulnerable Communities in Low -Resource Settings: Improved vaccines could offer more
9	8	Future Generations: With the potential to prevent cancers and chronic diseases linked to Epstein Barr Virus, along with reducing the risks of rabies and emerging pathogen
10	9	Dendritic Cells Play a role in immune signalling and antigen presentation.
11	10	T Cells and Other Immune Cells Involved in immune surveillance and muscle recovery
12	11	Fibroblasts Contribute to extracellular matrix maintenance and fibrosis.
13	12	Tenocytes Tendon -associated cells involved in muscle -tendon interactions.
14	13	Intrinsic and extrinsic factors regulating pancreas
15	14	Investigating the role of neutrophils in inflammation
16	15	Laboratory Rodent Anaesthesia and Analgesia
17	16	Mechanisms regulating short and long -lived
18	17	Modulation of brain circuits underlying learning and
19	18	Molecular Imaging in Cancer
20	19	Mouse models of pancreatic cancer and therapy
21	20	Neural control of growth and fertility
22	21	Neural mechanisms for learning and memory
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Text taken from projects 28 and 96

Hallucination? Fabrication!

ChatGPT was not the right app to use (Claude or Python, maybe?)

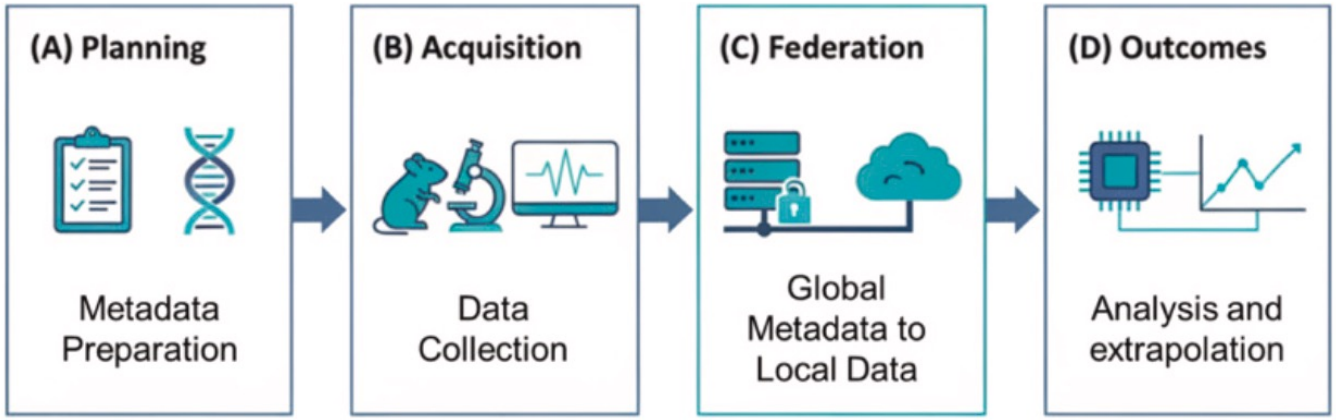
Neuroscience Applied
Volume 5, 2026, 106998

Short Communication

Data welfare is animal welfare: Building a WellFAIR research ecosystem

Benoit Petit-Demoulière [a], Damien Huzard [b c]

Finally, we must bridge the sociological gap that frequently separates the "3R/Welfare" community—veterinarians and ethics bodies—from bench scientists. This separation creates a disconnect where ethical oversight and daily data production operate in parallel silos. The **"Culture of Care"**—traditionally defined as a commitment to animal welfare beyond legal minimums—must **naturally extend** to include "Data Care." We must reimagine regulatory training to encompass not just the physical well-being of the animal, but the integrity of the data it produces.



Norecopa: PREPARE for better Science

FOUNDER

Damien Huzard, PhD

Damien Huzard, PhD, is the founder and CEO of Neuronautix. With over a decade of experience in behavioral and preclinical neuroscience and a PhD from EPFL, Switzerland, Damien specializes in mouse models, behavioral analysis, Home-Cage Monitoring, physiological recordings, metadata management, and FAIR data strategies.

He develops open-source tools and scientific software prototypes to improve behavioral data analysis, metadata structuring, and reproducible preclinical research.

Full profile & publications

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From *Culture of Care* to *Data Care*

Findability
Accessibility
Interoperability
Reusability

Wilkinson *et al.*, 2016
https://www.nature.com/articles/sdata201618

Import

Upload your research documents to assess ARRIVE 2.0 reporting completeness and PREPARE study planning readiness — with or without a dataset.

Try the demo — no API key needed
Loads a pre-filled example from **Huzard et al. (2025), Translational Psychiatry** — mechanical itch hypersensitivity in a Shank3 mouse model of autism. All ARRIVE 2.0 and PREPARE fields are extracted and ready to explore.

Load example dataset

Research Documents — Always available

Upload publications or protocols to extract ARRIVE 2.0 and PREPARE metadata. No dataset required.

Published Paper (PDF)
Extract ARRIVE 2.0 reporting fields and study metadata from a published paper or preprint.

Drop paper PDF here
or click to browse

Protocol / Study Plan (PDF)
Assess PREPARE planning readiness from a protocol document or study plan.

Drop protocol PDF here
or click to browse

Protocol Notes (Free Text)
Paste protocol notes, study plan text, or any relevant text to extract PREPARE and ARRIVE metadata with AI.

Paste protocol notes, study plan, or any relevant text here...

AI analysis requires an OpenAI key. Configure it in Settings.

Analyse with AI

Dataset — Optional

Upload your results data for a full FAIR assessment. Not required for ARRIVE/PREPARE assessment only.

Drop CSV or Excel file here
or click to browse

or

Skip — Assess ARRIVE/PREPARE only

Opens Templates page in ARRIVE/PREPARE assessment mode

What this tool assesses

ARRIVE 2.0 — Did you report everything needed to evaluate your published study?

PREPARE — Did you plan everything needed before running your experiment?

FAIR — Is your dataset Findable, Accessible, Interoperable, and Reusable? (requires dataset upload)

These are readiness assessments, not legal or regulatory certifications.

Standards Templates

Assess your study against ARRIVE 2.0 reporting standards and PREPARE study planning readiness.

ARRIVE 2.0
Reporting completeness assessment
Did you report everything needed to evaluate your published study?

PREPARE
Study planning readiness
Did you plan everything needed before running your experiment?

ARRIVE-PREPARE Crosswalk Recommended
Both phases together
Assess planning AND reporting in one combined review.

FAIR-Readiness Score

Rule-based, transparent assessment — not a regulatory certification

50 / 100

FAIR-Readiness Estimate
Rule-based score — not a regulatory certification

F — Findable 20 / 25
Main weakness: Missing creator or contact
- Dataset title present
- Dataset description present
- Dataset identifier / URI present
- Creator or contact present
- Keywords or ontology terms present

A — Accessible 10 / 20
Main weakness: No access conditions stated
- License defined
- Access conditions stated
- File format open (CSV)
- Contact or repository present

I — Interoperable 5 / 30
Main weakness: No controlled vocabularies or URI mapping
- Column metadata present
- Units defined for measurements
- Controlled vocabularies used
- External ontology or URI mapping
- JSON-LD or CSVW export ready
- Stable identifiers for entities

R — Reusable 15 / 30
Main weakness: No protocol or method described
- Protocol or method described
- Provenance captured
- Data dictionary present
- Missing values documented
- Version or date recorded
- declares_template_conformance

Benjamin Victor Ineichen · 1st
Professor, MD, PhD
1d · Edited ·

Can large language models help make drug development more efficient and evidence-based?

Over the next four years, our COST Action LLM4Drugs will bring together >50 experts and early career researchers from 16 European countries to address exactly this question.

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Data privacy

Use API (*Application Programming Interface*) versions so that your data is not used to train models, unlike the consumer versions of ChatGPT and Claude

Consider using local Large Language Models (LLMs) on a private server, so no data ever leaves your institution’s network

NC 3Rs National Centre for the Replacement Refinement & Reduction of Animals in Research

Who we are | Our portfolio | Our funding schemes | 3Rs resource library

Home › Who we are

Our strategy

We will fund the development of a tool to automatically check compliance with the **ARRIVE Essential 10** reporting recommendations for *in vivo* research, helping researchers and journals ensure that publications include all of the information required to assess the reliability of the findings presented. The tool will be available by the end of 2024 and will be free to use. Our goal is to have at least 50 journals employing the compliance checker as part of their editorial processes in the first year following its release.

https://nc3rs.org.uk/who-we-are/our-strategy

We need to reposition Laboratory Animal Science

From a peripheral function
To an integrated scientific quality discipline that supports better research

From "How do I satisfy the requirements?"

To "How do I produce the most reliable and informative science possible?"

Scientists will be more engaged if they see that good planning

- reduces failed experiments
- decreases variability
- lowers animal numbers
- improves publication quality
- strengthens grants

and that

- poor welfare affects physiology and behaviour
- stressed animals produce noisier data
- underpowered studies waste animals
- biased experiments undermine translation to humans

Move from "Have you complied with PREPARE?"
to "How did good planning improve your science?"

Scientists respond better to

- decision trees
- protocol builders
- interactive design assistants
- example datasets
- automated reporting prompts
- specific templates

"You are using male mice only. Would sex balance affect translational validity?"

"This analgesic may influence your inflammatory endpoint."

"Your proposed group size appears underpowered given expected variance."

"Circadian timing may confound this behavioural assay."

Move from "compliance after design" to "quality assistance during design"

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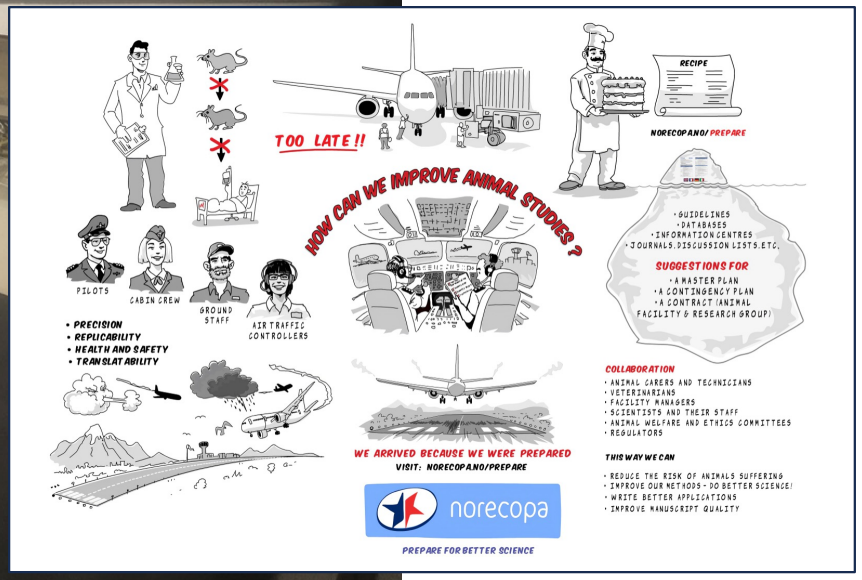
"We ARRIVED, because we were PREPARED"

- ✓ *Better Science*
- ✓ *Improved animal welfare*
- ✓ *Advancement of the 3Rs*
- ✓ *Safer working environment*



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https://norecopa.no/prepare/film

We can also be better at reporting 3R advances!

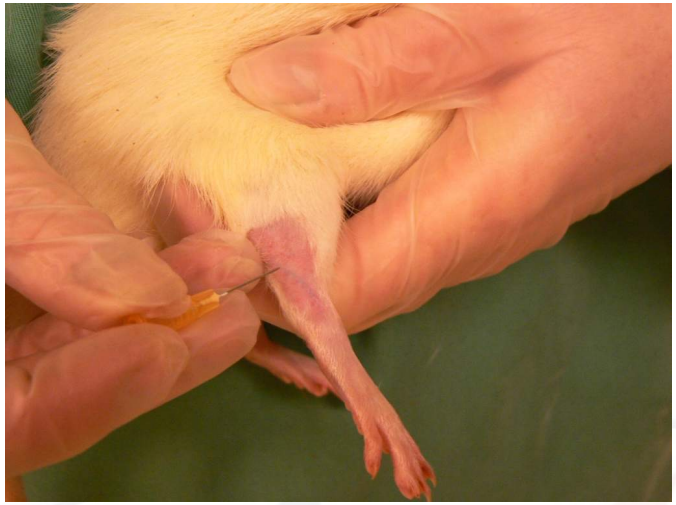
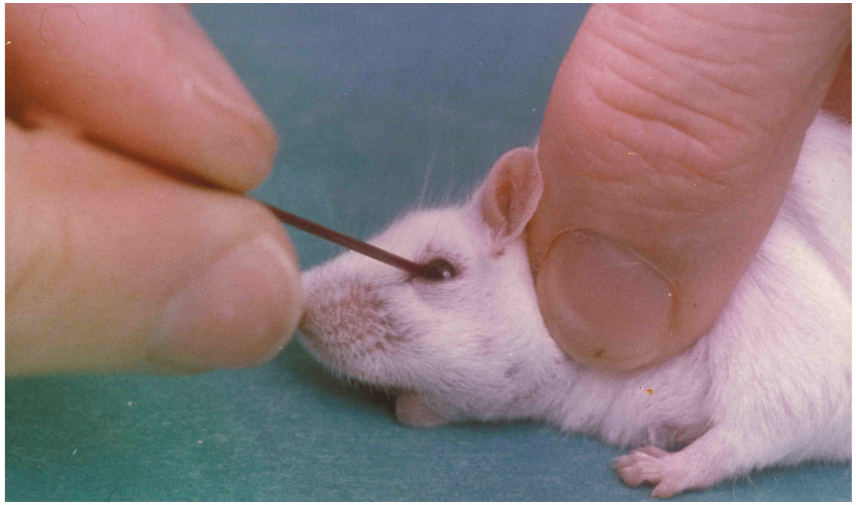


foto: NMBU



SCID-Hu mice immunized with a pneumococcal vaccine produce specific human antibodies and show increased resistance to infection.

Aaberge I.S. *et al.*, Infection & Immunity, 1992, 60 (10): 4146-4153
https://journals.asm.org/doi/10.1128/iai.60.10.4146-4153.1992

Saphenous vein puncture for blood sampling of the mouse, rat, hamster, gerbil, guineapig, ferret and mink

Annelise Hem[1], Adrian J. Smith[2] & Per Solberg[1]

[1]Laboratory Animal Unit, National Institute of Public Health, PO Box 4404 Torshov, N-0403 Oslo and [2]Laboratory Animal Unit, Norwegian School of Veterinary Science, PO Box 8146 Dep., N-0033 Oslo, Norway

© Laboratory Animals Ltd. *Laboratory Animals* (1998) **32**, 364–368

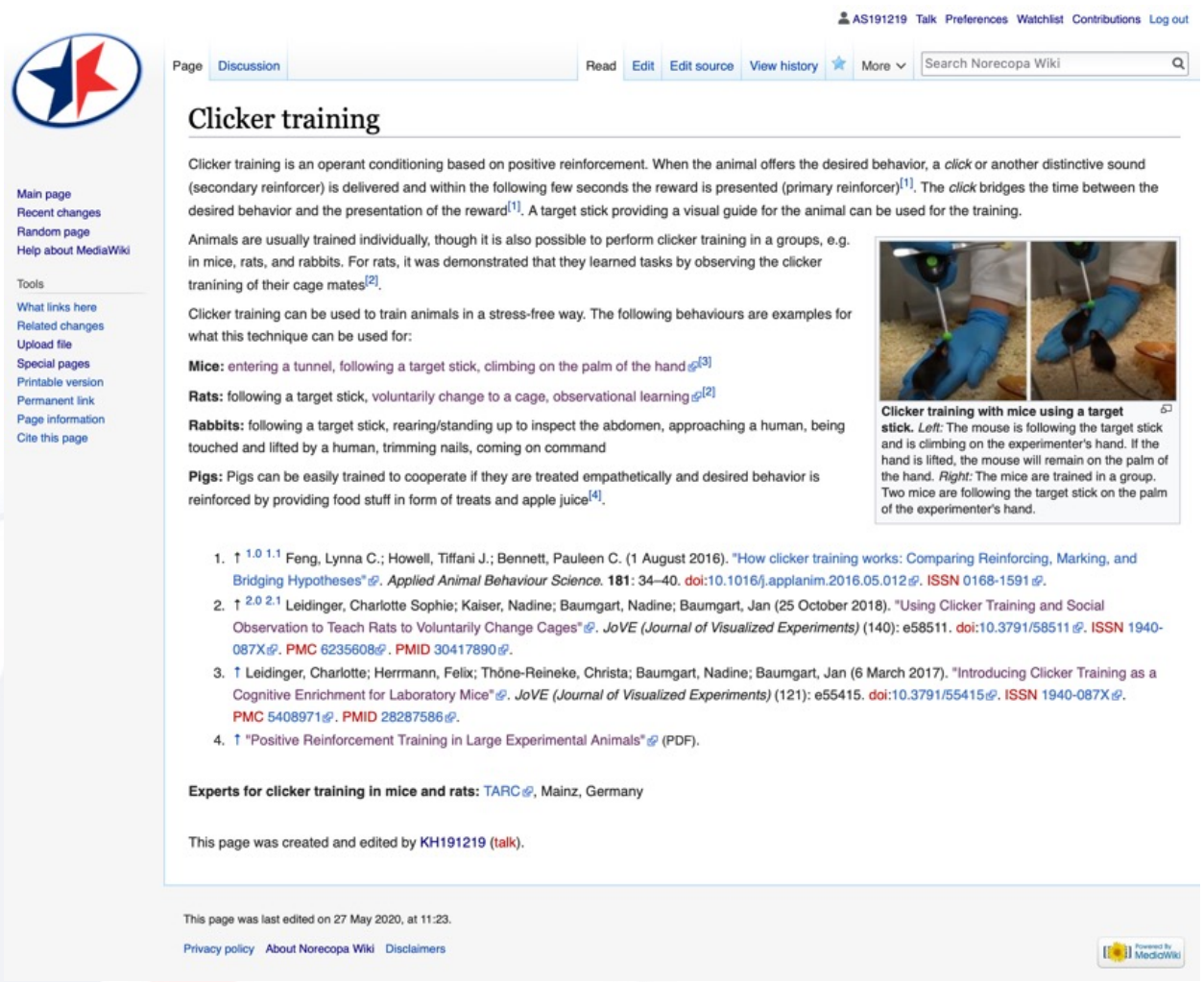
Summary

A method is described for blood collection from the lateral saphenous vein. This enables rapid sampling, which if necessary can be repeated from the same site without a need for new puncture wounds. The method is a humane and practical alternative to cardiac and retro-orbital puncture, in species where venepuncture has traditionally been regarded as problematic.

Keywords Saphenous vein; blood sampling; mouse; rat; hamster; gerbil; guineapig; rodent; ferret; mink

Not necessarily a high-impact journal

Refinement Wiki: wiki.norecopa.no



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Clicker training

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Clicker training is an operant conditioning based on positive reinforcement. When the animal offers the desired behavior, a *click* or another distinctive sound (secondary reinforcer) is delivered and within the following few seconds the reward is presented (primary reinforcer)[1]. The *click* bridges the time between the desired behavior and the presentation of the reward[1]. A target stick providing a visual guide for the animal can be used for the training.

Animals are usually trained individually, though it is also possible to perform clicker training in a groups, e.g. in mice, rats, and rabbits. For rats, it was demonstrated that they learned tasks by observing the clicker tranining of their cage mates[2].

Clicker training can be used to train animals in a stress-free way. The following behaviours are examples for what this technique can be used for:

Mice: entering a tunnel, following a target stick, climbing on the palm of the hand[3]

Rats: following a target stick, voluntarily change to a cage, observational learning[2]

Rabbits: following a target stick, rearing/standing up to inspect the abdomen, approaching a human, being touched and lifted by a human, trimming nails, coming on command

Pigs: Pigs can be easily trained to cooperate if they are treated empathetically and desired behavior is reinforced by providing food stuff in form of treats and apple juice[4].

Clicker training with mice using a target stick. *Left:* The mouse is following the target stick and is climbing on the experimenter's hand. If the hand is lifted, the mouse will remain on the palm of the hand. *Right:* The mice are trained in a group. Two mice are following the target stick on the palm of the experimenter's hand.

1. ↑ 1.0 1.1 Feng, Lynna C.; Howell, Tiffani J.; Bennett, Pauleen C. (1 August 2016). "How clicker training works: Comparing Reinforcing, Marking, and Bridging Hypotheses". *Applied Animal Behaviour Science*. **181**: 34–40. doi:10.1016/j.applanim.2016.05.012. ISSN 0168-1591.
2. ↑ 2.0 2.1 Leidinger, Charlotte Sophie; Kaiser, Nadine; Baumgart, Nadine; Baumgart, Jan (25 October 2018). "Using Clicker Training and Social Observation to Teach Rats to Voluntarily Change Cages". *JoVE (Journal of Visualized Experiments)* (140): e58511. doi:10.3791/58511. ISSN 1940-087X. PMC 6235608. PMID 30417890.
3. ↑ Leidinger, Charlotte; Herrmann, Felix; Thöne-Reineke, Christa; Baumgart, Nadine; Baumgart, Jan (6 March 2017). "Introducing Clicker Training as a Cognitive Enrichment for Laboratory Mice". *JoVE (Journal of Visualized Experiments)* (121): e55415. doi:10.3791/55415. ISSN 1940-087X. PMC 5408971. PMID 28287586.
4. ↑ "Positive Reinforcement Training in Large Experimental Animals" (PDF).

Experts for clicker training in mice and rats: TARC, Mainz, Germany

This page was created and edited by KH191219 (talk).

This page was last edited on 27 May 2020, at 11:23.

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c. 75 topics (June 2026)

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- Acclimatisation
- Adrian Smith
- Alphaxalone
- Anaesthesia in neonates
- Analgesia
- Asepsis
- Blood sampling of hamsters
- Blood sampling of pigs
- Blood sampling of rainbow trout
- Breeding strategies for mice
- Clicker training
- Contingency plans
- Decapitation
- Dehydration
- Detecting early onset of clinical signs in the mouse model of Covid-19
- Detection of pain and distress in mice
- EMLA cream
- Embryo transfer
- Experimental Autoimmune Encephalomyeltis (EAE)
- Facial expression analysis
- Food crunchers
- Forced swim test
- General discusson on use of analgesics
- Genotyping mice
- Geriatric mice
- Habituation training
- Health monitoring
- High-fat diets
- Hot Bead Sterilisers
- Housing nude mice
- Housing research fish
- Humane endpoints
- Hydrodynamic gene delivery
- Intra-ocular injections
- Intranasal administration
- Intraperitoneal injection
- Intraperitoneal pentobarbitone
- Irradiation for haematology studies
- Ketamine and alpha-2 agonist combinations
- Lockbox enrichment
- Long-term anaesthesia in rodents
- Lumpfish
- MDA (micropipette-guided drug administration) Method
- Main Page
- Marble Burying Test
- Metabolic cages
- Microchipping rats and mice
- Minipumps
- Montanide adjuvant
- Mouse Grimace Scale
- Mouse handling
- Nest building material
- Non-invasive genetic sampling in wildlife research
- Oestrus suppression in ferrets
- Pneumocystis murina
- Recapping needles
- Refinement of oral gavage
- Rotarod Test
- Screening cell lines
- Sedation of cattle
- Splenectomy
- Sterilisation of instruments
- TTEAM and TTouch
- Tail vein injection
- Tamoxifen
- Tamoxifen information sheet V4.pdf
- The use of DMSO
- Tramadol
- Transport stress
- Tumour cell implant into mammary fat pad
- Ulcerative Dermatitis in Mice
- Water quality
- Xenopus laevis
- Zebrafish swabbing

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- News of Norecopa
- Highlights from Norecopa's Annual Meeting
- Aurora Brønstad wins Norecopa's 3R Prize
- UFAW Handbook - new edition published
- Website of the Nordic Zebrafish Network
- Refinement of oral administration
- European Network of National Networks of Animal Welfare Bodies
- Mouse tail simulator for i.v. injection
- News of other 3R Centres and activities
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Aurora Brønstad wins Norecopa's 3R Prize

We congratulate Aurora Brønstad, laboratory animal veterinarian at the University of Bergen, who was awarded Norecopa's annual 3R Prize on 4 June, after the annual meeting.

There were two nominees for this year's prize in addition to Aurora Brønstad:

- Cesilie Røtnes Amundsen at Nord University was nominated for her contributions to fish welfare, teaching and implementation of the 3Rs, including the initiative to start a Nordic Zebrafish Network, of which she is the leader.

Website of the Nordic Zebrafish Network

In a previous newsletter we informed of the creation of a Nordic Zebrafish Network, founded in November 2023.

The Network has started to build its website, which is hosted by the Karolinska Institutet in Stockholm.

The Network will arrange its second course on the husbandry and use of zebrafish in November, followed (like last year) by a Network meeting to discuss the way ahead.

Suggestions for resources to add to the website are very welcome.

June 2026

- Animal-Free Chemical Safety Assessment and Roadmap Implementation Conference, Brussels, 1-3 June 2026
- Colony Management Fundamentals, webinar (Alexandra Deick), 2 June 2026
- Bridging the Translational Gap: Bioprinted Liver Models for Predictive Drug Testing & Regenerative Medicine, webinar (Shaochen Chen & Ting-Yu Lu), 2 June 2026
- Exploring Whistleblowing and Breaches of Good Research Practice, UKRIO webinar, 3 June 2026
- Developing In Utero Nano-Injection: More Results in Fewer Mice, webinar (Emma Andersson), 3 June 2026
- Reducing Animal Use with One-step CRISPR Mutagenesis: The i-GONAD Method, webinar (Andrei Chagin), 3 June 2026
- Impact of Sound on the Welfare of Animals Used for Experiments, webinar (Pralle Kriengwatana), 3 June 2026
- NAMs Technology Partn3Ring webinar series, Session 4, 3 June 2026
- Basic Mouse Colony Management Course, webinar (Alexandra Deick), 4 June 2026
- CCAC National Workshop, virtual event, 4 June 2026
- 2nd Central East-European Laboratory Animal Science Congress (CELASC, CELAS-ESLAV-ECLAM), Budapest, 3-5 June 2026
- Annual CALAS Symposium, Toronto ON, 6-9 June 2026
- Introduction to Systematic Review and Meta-Analysis of Animal Studies, online workshop, 8-10 June 2026
- A New Refinement Strategy to Oral Gavage: The Micropipette-Guided Drug Administration (MDA) Method, webinar (Paulin , 2026
- Data-Driven Breeding Planning, webinar (Alexandra Deick), 9 June 2026
- 'Data Care' is the New Frontier of Animal Welfare, webinar (Benoit Petit-Demoulière & Damien Huzard), 9 June 2026
- Openness in Animal Research Conference, West Midlands, 9-10 June 2026
- Spanish language lab animal symposium, Los Angeles/online, 9-10 June 2026
- Effective communication with animal science committees, webinar (Ngaire Dennison), 10 June 2026
- Replacing sentinels with environmental health monitoring, webinar (Megan LaFollette & Juanita Raath), 10 June 2026
- Laboratory Skills for Animal Technicians, Harwell, 10 June 2026
- 50th AFSTAL congress, Reims, 10-12 June 2026
- Norecopa's Annual Meeting, Ås/online, 11 June 2026
- Data-Driven Breeding Planning, webinar (Alexandra Deick), 11 June 2026
- Swiss 3Rs Day: 3Rs in Immunology and Infectious Disease, Basel, 11 June 2026
- Navigating Mouse Nomenclature and Genetic Drift - Best Practices for Research Integrity, Charles River webinar, 11 June 2026
- R3FINE Conference & Workshop, Istanbul, 11-14 June 2026
- Seminar series on "Understanding and Improving Animal Experiments", 12 June 2026
- Advancing Animal-Free Science Through Innovation & Engagement, Brussels, 15-
- Summer Immersion on Innovative Approaches in
- Epic Breeding
- online workshop, 16 - 19 June 2026
- , webinar (J-P Mocho), 17 June 2026
- 16th Minipig Research Forum, Rome, 17-19 June 2026
- Epic Breeding Fails, webinar (Alexandra Deick), 18 June 2026
- RE-Place Educational Webinars on Innovative Human-Relevant Approaches in Drug Research, webinar, 18 June 2026
- From soap boxes to stand up - doing openness as an individual, UAR webinar, 18 June 2026
- Using Conditional Transgenic Models, Harwell, 18-19 June 2026
- Practical guidance on how to include sex as a biological variable in study design and analysis, webinar (Ivana Jaric), 19 June 2026
- Principles and Practices of Biosafety, Charlotte, 21 - 26 June 2026
- ART (Animal Research Tomorrow) Award Ceremony and Conference, online event, 22 June 2026
- EALAS Panel Experts: Ask your surgical questions, webinar, 22 June 2026
- 7th International Focus on Severe Suffering meeting, RSPCA event, Madrid, 22-23 June 2026
- European Organ-on-Chip Society (EUROoCS) Annual Meeting, Braga, 22-24 June 2026
- René Remie Rodent Surgery Training Course (3 days), 22-24 June 2026
- René Remie Rodent Surgery Training Course (5 days), 22-26 June 2026
- SABV (Sex As a Biological Variable) Symposium, Zurich, 23-24 June 2026
- UFAW Centenary Conference, London/online, 23-25 June 2026
- Influencing people with integrity, online course, 29-30 June 2026
- 23rd International ESTIV congress, Maastricht, 29 June - 2 July 2026
- CAMCON26 - 3rd International CAM (Chorioallantoic membrane) Congress, Liverpool, 30 June - 2 July 2026

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+ webpages for recorded meetings, sorted by PREPARE topics

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Monthly webinars:

The Validity of Animal Models

What We Get Right, What We Get Wrong, and Why It Matters

Free webinar (via Google Meet)

- **Up to 1,000 registered participants**
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- Additional participants will join in **view-only mode**
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Speaker

Joseph Garner, D.Phil., is Professor in the Department of Comparative Medicine at Stanford University and an internationally recognized expert in laboratory mouse behavior and welfare. Trained at University of Oxford and University of California, Davis, his work focuses on why animal research often fails to translate to human outcomes and how improving animal welfare can strengthen scientific validity. Dr. Garner leads innovative 3Rs services supporting better experimental design and methodology. He has authored over 190 peer-reviewed papers and received multiple international awards for advancing animal welfare and translational science.

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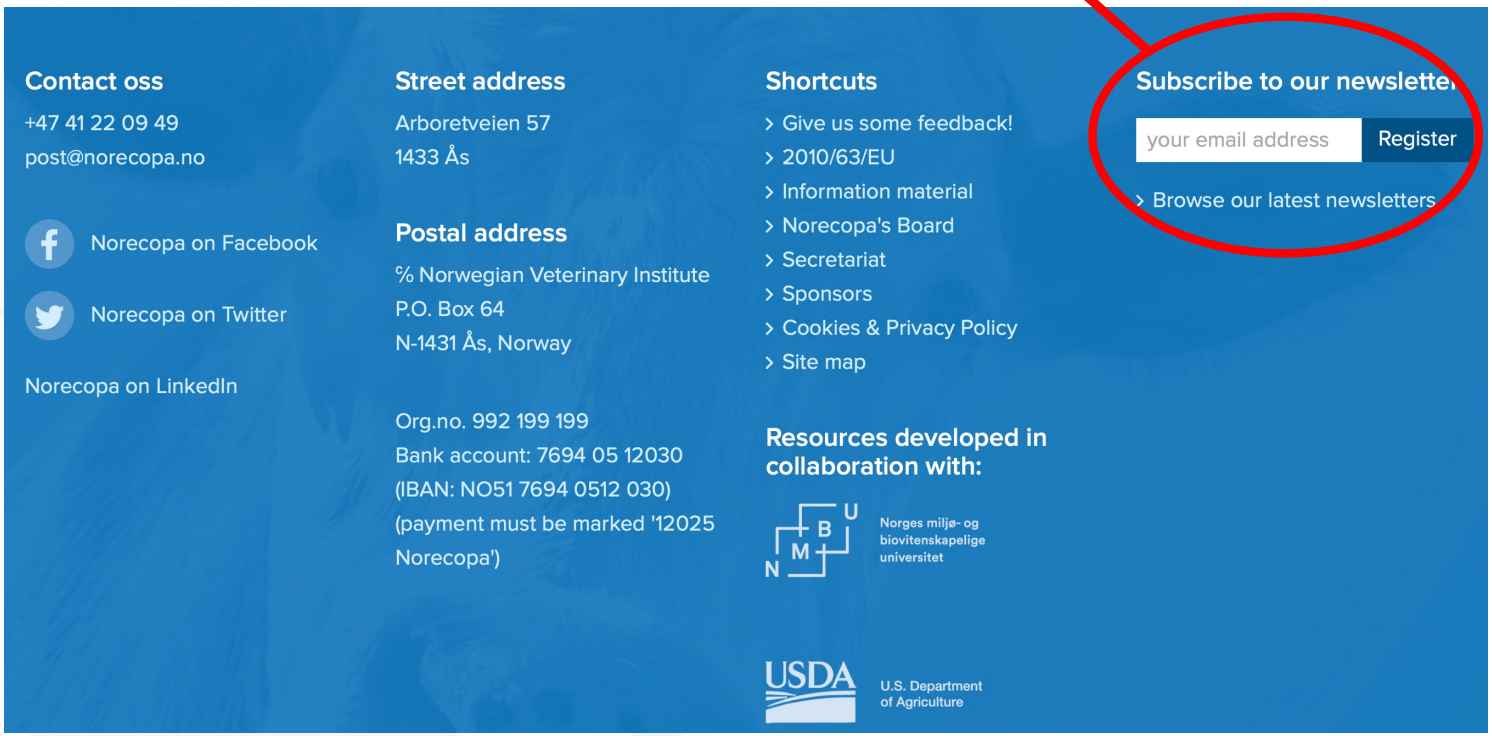

Thank you for listening!

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