

# Animal Protection Research Prize for social and civic engagement in the field of laboratory animals:

*Thank you from Norecopa!*

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**[norecopa.no/220425](https://norecopa.no/220425)**



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[carolsplaces.com](http://carolsplaces.com)

Norwegian School of Veterinary Science 1981-2011

*accredited by AAALAC International from 2002*



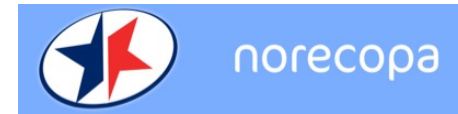
Secretary of Norecopa since its foundation in 2007

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[peta.org](http://peta.org)



Thanks to animal research,  
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protest 20.8 years longer.



According to the US Department of Health and Human Services, animal research has helped extend our life expectancy by 20.8 years. Of course, how you choose to spend those extra years is up to you.

Foundation for Biomedical Research

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[fbresearch.org](http://fbresearch.org)

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animal welfarists/activists



scientists



animal technicians



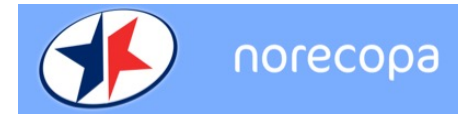
**veterinarian**



the authorities

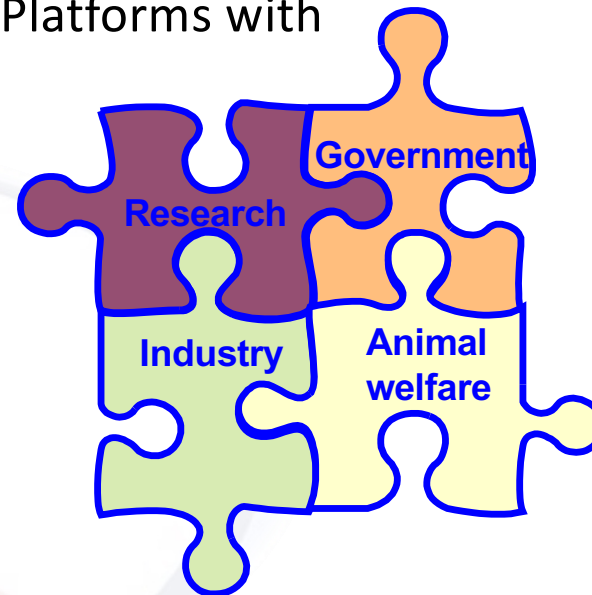


*All the time: weigh the potential benefits of the research against the harms of using animals*



*Norecopa is a National Consensus Platform for the 3Rs:  
**Replacement, Reduction and Refinement** of animal experiments*

*A member of **ecopa**:  
European Consensus-Platform for Alternatives  
which recognises National **Consensus** Platforms with  
**4 stakeholders** equally represented:*



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## ★ FULL MEMBERS

**3 R  
C C** Swiss 3R  
Competence  
Centre

### **Switzerland**

Swiss 3Rs Competence  
Centre.



### **Finland**

Finnish National Consensus  
Platform for Alternatives.

**FRANCO**PA

### **France**

French Platform for the  
Development of  
Alternative Methods in  
Testing.



### **Italy**

Italian Platform on  
Alternative Methods.



### **Norway**

Norway's Consensus-  
Platform for Replacement,  
Reduction and Refinement  
of Animal Experiments.



### **Spain**

Spanish Network for the  
Development of  
Alternative Methods.



### **Germany**

German Foundation for the  
Promotion of Alternate and  
Complementary Methods  
to Reduce Animal Testing.

## ★ 2 ASSOCIATE MEMBERS



### **Romania**

Romanian Center for  
Alternative Test Methods.



### **Austria**

The RepRefRed Society, the  
association "Gesellschaft  
zur Förderung von  
Alternativen Biomodellen".

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## ***"PREPARE for 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)
- a culture of care at the animal facility
- communication of best practice to others



colourbox.com

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## More than 3Rs

### ***The 3 Rs to minimise the harm:***

- *Replace the unnecessary experiments*
- *Reduce the number of animals used*
- *Refine the conditions for the animals*

### ***The 3 Vs to increase the validity of the experiment:***

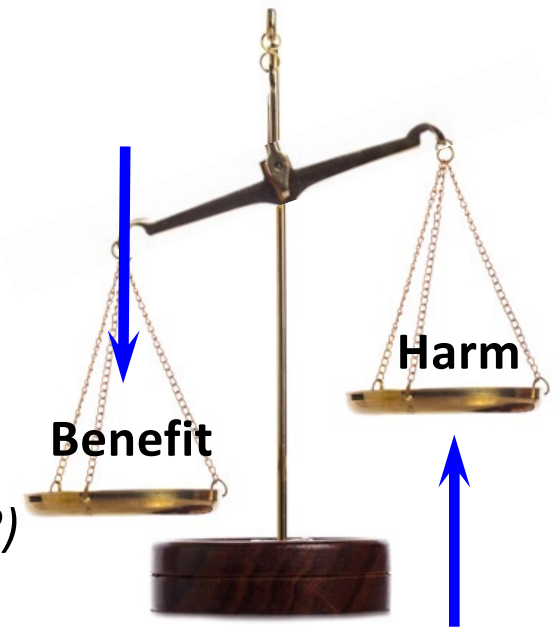
- *Construct Validity (can the model answer the question?)*
- *Internal Validity (has the experiment been correctly designed?)*
- *External Validity (are the results translatable to the target group?)*

### ***The 3 Ss - use your commonsense and your heart***

- *Good Science*
- *Good Sense*
- *Good Sensibilities*



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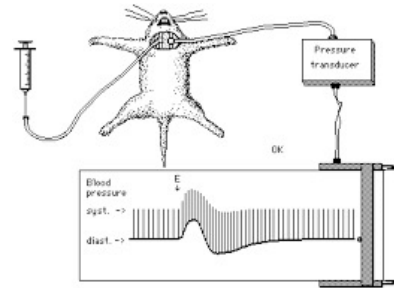


[norecopa.no/3R](https://norecopa.no/3R)  
[norecopa.no/3V](https://norecopa.no/3V)  
[norecopa.no/3S](https://norecopa.no/3S)

***Our work with alternatives started 34 years ago ...***



wikipedia.org



Pharmatutor



NORINA, 1991



*Laboratory Animals Ltd, 1996*

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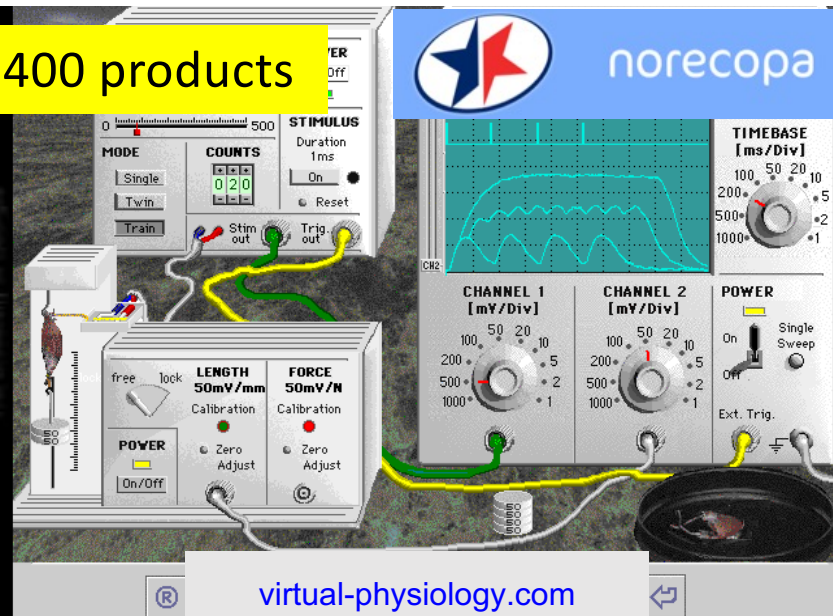
***“Current status and future developments of databases on alternative methods”***



ECVAM workshop, Neubiberg, Munich, 1996

Norecopa: PREPARE for better research

NORINA database: today approx. 3,400 products





## TextBase:

1,900 books related to  
Lab Animal Science, welfare  
and alternatives:

[norecopa.no/textbase](http://norecopa.no/textbase)

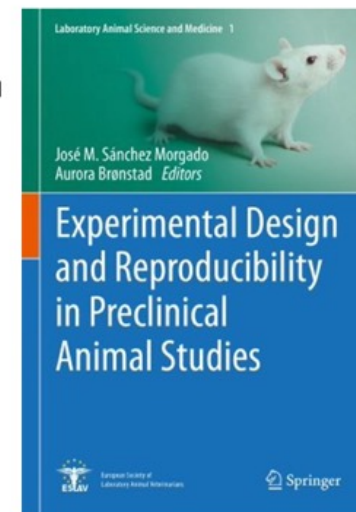
## Experimental Design and Reproducibility in Preclinical Animal Studies

By José M. Sánchez Morgado & Aurora Brønstad (Eds.)

Record number: 8619d

This book provides grounds on how to plan and conduct animal experiments that can be reproduced by others. It touches on factors that may impact the reproducibility of animal studies including: the animal genetic background, the animal microbial flora, environmental and physiological variables affecting the animal, animal welfare, statistics and experimental design, systematic reviews of animal studies, and the publishing process.

The book addresses advanced undergraduates, graduate students and all scientists working with animals.



[norecopa.no/textbase/experimental-design-and-reproducibility-in-preclinical-animal-studies](http://norecopa.no/textbase/experimental-design-and-reproducibility-in-preclinical-animal-studies)

# 3R-Guide: over 400 guidelines for animal studies

## norecopa.no/3r-guide



norecopa

### Working Party Report

Guidance on the severity classification of scientific procedures involving fish: report of a Working Group appointed by the Norwegian Consensus-Platform for the Replacement, Reduction and Refinement of animal experiments (Norecopa)

P Hawkins (Convenor)<sup>1</sup>, N Demisson<sup>2</sup>, G Goodman<sup>3</sup>, S Hetherington<sup>4</sup>, S Llywelyn-Jones<sup>5</sup>, K Ryde<sup>6</sup> and A J Smith<sup>7</sup>

<sup>1</sup>Norwegian Animal Experiment, RIVM, Wilhelmsdijk, Southwold, West Sussex PO43 9RS, UK; <sup>2</sup>Animals (Scientific Procedures) Inspectorate, Home Office, PO Box 6773, Dundee DD1 9YW, UK; <sup>3</sup>Biological Services, The University of Edinburgh, Chancellor Building, 48, Little France Crescent, Edinburgh EH9 1JH, UK; <sup>4</sup>CFRIS, Painesfield Road, Lowestoft, NR33 0HT, UK; <sup>5</sup>King's College London, Biological Services Unit, 4th floor, Hodgkin Building, Guy's Campus, London SE11 1UL, UK; <sup>6</sup>Norecopa, c/o Norwegian Veterinary Institute, PO Box 750 Sentrum, N-0108 Oslo, Norway

### Abstract

The severity classification of procedures using animals is an important tool to help focus the implementation of refinement and to assist in reporting the application of the 3Rs (replacement, reduction and refinement). The recently revised Directive that regulates animal research and testing within the European Union requires Member States to ensure that all procedures are classified as 'non-recovery', 'mild', 'moderate' or 'severe', using assignment criteria set out by the European Commission (EC). However, these are focused upon terrestrial species, so are of limited relevance to fish users. A Working Group set up by the Norwegian Consensus-Platform for the 3Rs (Norecopa) has produced guidance on the classification of severity in scientific procedures involving fish, including examples of 'subthreshold', 'mild', 'moderate', 'severe' and 'upper threshold' procedures. The aims are to complement the EC guidelines and help to ensure that all suffering fish is effectively predicted and minimized. Norecopa has established a website ([www.norecopa.no/categories](http://www.norecopa.no/categories)) where more information on severity classification for procedures using fish, including field research, will be made available.

**Keywords:** Fish, harm-benefit assessment, humane endpoints, refinement, severity

**Laboratory Animals** 2011; 1-6. DOI: 10.1255/la.2011.010181

### Background

An effective prediction of the effects of a research protocol on the animals concerned helps to ensure that any pain, suffering or distress they may experience will be effectively anticipated, recognized and alleviated. This is essential not only for animal welfare but also for scientific validity, because physiological and behavioural responses to suffering can significantly affect data quality. Severity classification is thus an important tool to help focus the implementation of refinement, including monitoring its progress, and to assist in reporting the application of the 3Rs (replacement, reduction and refinement) of Russell and Burch<sup>1</sup>, which is now an integral part of the legislation on animal research and testing in many countries. Prediction of severity are also fundamental to the harm-benefit

assessments undertaken by bodies such as regulatory authorities and ethical committees when deciding whether or not a project should be licensed or funded.

There may also be a legal requirement to predict and classify severity. For example, the new Directive regulating animal use within the European Union, which must be implemented within all Member States by January 2013, requires the severity of each procedure to be classified on the basis of the degree of pain, suffering, distress or lasting harm expected to be experienced by an individual animal during the course of the procedure, with the aim of enhancing transparency, facilitating the project authorization process and providing tools for monitoring compliance.<sup>2</sup> Member States will have to ensure that all procedures are classified as 'non-recovery', 'mild', 'moderate' or 'severe' on a case-by-case basis, using the assignment

## AVMA Guidelines for the Euthanasia of Animals: 2020 Edition\*

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Raymond Anthony, PhD (Ethicist), University of Alaska Anchorage, Anchorage, Alaska  
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\*The AVMA Panel on Euthanasia develops the content of the guidelines, with support from its working groups. The panel is required to do a comprehensive review and update of the report at least every 10 years, although more frequent major reviews are possible based on substantive information gleaned from new research and experience with practical implementation. To ensure the guidelines remain as up-to-date as possible, interim revisions (editorial substantive updates, but of a less extensive nature than a major revision) are also acknowledged.

ATLA 34, 161-162, 2009

## A Gold Standard Publication Checklist to Improve Quality of Animal Studies, to Fully Integrate the and to Make Systematic Reviews More Feasible

Carlijn R. Hooijmans, Marlies Leenaars and Merel Ritskes-Hoitinga

Radboud University Nijmegen Medical Centre, Central Animal Laboratory and 3R Research Nijmegen, The Netherlands

**Summary**—Systematic reviews are generally regarded by professionals in the field of medicine as the highest level of medical evidence, and they are already standard practice for them. However, they are not yet widely used nor undertaken in the field of animal experimentation; there is a lot to be gained from the process. Therefore, a gold standard publication checklist for animal studies is presented in this paper. The items on the checklist have been selected on the basis of literature analysis and the resulting scientific evidence that these factors are decisive in the outcome of animal studies. In order to make future systematic reviews and meta-analyses possible, to allow others to replicate and build on work previously published, demands on animals needed in animal experimentation (reduction), improve animal welfare (refinement) and improve the quality of scientific papers on animal experimentation, this publication checklist is used and followed. We have discussed and optimized this GSPC through feedback from experts in the field of animal experimentation. From these interviews, it became clear that the adoption of this GSPC when journals demand it. The GSPC was compared with the current standards in animal studies. In general, the journals' demands for the description of the animal studies that it is not possible to repeat the studies, let alone carry out a systematic review. By using animal studies, the quality of scientific papers will be improved. The use of the GSPC and its improvement in the quality of scientific papers will also contribute to decreased variation in standardization and, as a consequence, a reduction in the numbers of animals used and the outcome of animal studies. It is of major importance that journal editors become convinced of these recommendations, because only then will scientists follow these guidelines to the full.

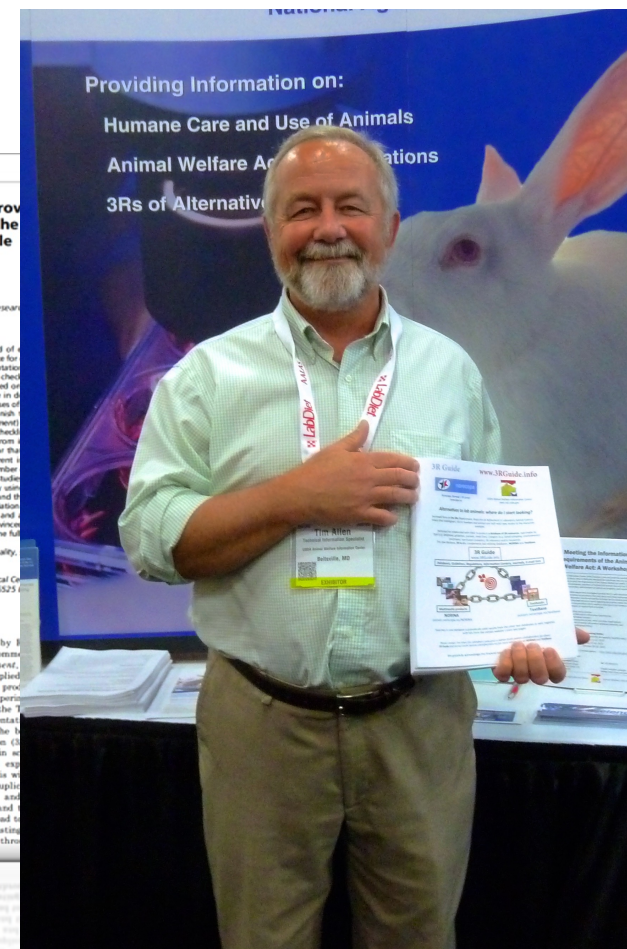
**Key words:** animal experimentation, meta-analysis, publication checklist, scientific quality, review

**Address for correspondence:** Carlijn Hooijmans, Radboud University Nijmegen Medical Centre, Central Animal Laboratory and 3R Research Centre, Geert Groeninklaan 29, suite 231, 6525 GJ The Netherlands.  
E-mail: C.Hooijmans@isg.umcn.nl

### Introduction

A systematic review (SR) is a literature review focused on a single question which tries to identify, appraise, select and synthesize all available high-quality research evidence relevant to that question (1). SRs are generally regarded by evidence-based medicine professionals as the highest level of medical evidence, and they are already standard practice in clinical studies. However, SRs are not yet widely used nor undertaken in the animal experimentation field, although there would be a lot to be gained from the process. A systematic approach to incorporate all available relevant literature into the design of an animal experiment is a prerequisite for research which is of high scientific quality. Good science, from a scientific as well as an animal welfare point of view, is the basis of the book *The Principles of Humane*

*Experimental Technique*, by Russell and Burch (2). In this book, they recommend that the principles (Replacement, Refinement) should be applied in animal studies. Besides pre-research, SRs of animal experiments provide the proper argumentation for the animal model will give the best results. The clinical research question (3) whether there are gaps in the knowledge that require new animal experiments and refinement. This is a necessary step in the planning of animal experiments (reduction), and unnecessary animal use and the animal studies will also lead to the reduction of the already existing from animal experiments, three



Tim Allen, AWIC, USDA

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## Working Party Report

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<sup>1</sup>Research Animals Department, RSPCA, Woburn Way, Southwark, West Sussex RH13 9RL, UK; <sup>2</sup>Animals (Scientific Procedures) Inspectorate, Home Office, PO Box 6778, Dundee DD1 9MW, UK; <sup>3</sup>Biological Services, The University of Edinburgh, Charlotte Building, 48, Little France Crescent, Edinburgh EH8 4JB, UK; <sup>4</sup>CEFAS, Wellesford Road, Lowestoft, NR33 0HT, UK; <sup>5</sup>King's College London, Biomedical Services Unit, 4th floor, Hodgkin Building, Guy's Campus, London SE1 1UL, UK; <sup>6</sup>Norecopa, c/o Norwegian Veterinary Institute, PO Box 750 Sentrum, N-0108 Oslo, Norway  
Corresponding author: P Hawkins. Email: phawkins@nrcopa.org.uk

### Abstract

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*Laboratory Animals* 2011; 1-6. DOI: 10.1258/la.2011.010181

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assessments undertaken by bodies such as regulatory authorities and ethical committees when deciding whether or not a project should be licensed or funded.

There may also be a legal requirement to predict and classify severity. For example, the new Directive regulating animal use within the European Union, which must be implemented within all Member States by January 2013, requires the severity of each procedure to be classified on the basis of the 'degree of pain, suffering, distress or lasting harm expected to be experienced by an individual animal during the course of the procedure', with the aim of enhancing transparency, facilitating the project authorization process and providing tools for monitoring compliance.<sup>2</sup> Member States will have to ensure that all procedures are classified as 'non-recovery', 'mild', 'moderate' or 'severe' on a case-by-case basis, using the assignment

# Guidance on the severity classification of procedures involving fish

## A supplement to EU's guidance

Expert working group on severity classification of scientific procedures performed on animals

FINAL REPORT

Brussels, July 2009

Conducted in support of the revision of Directive 86/609/EEC on the protection of animals used for scientific purposes

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11.

[http://ec.europa.eu/environment/chemicals/lab\\_animals/pdf/report\\_ewg.pdf](http://ec.europa.eu/environment/chemicals/lab_animals/pdf/report_ewg.pdf)

P Hawkins, N Dennison, G Goodman, S Hetherington, S Llywelyn-Jones, K Ryder and AJ Smith (2011)

[norecopa.no/categories](http://www.norecopa.no/categories)

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## Databases & Guidelines

Published lists of resources are difficult to search and quickly become outdated. Lists on a website are easier to search, but do not enable the use of filters or intelligent search engines.

***Norecopa has therefore constructed four databases, which together with all the text on this website can be searched simultaneously using the search field at the top of every page.***

- › [3R Guide](#): a global overview of **databases, guidelines, information centres, journals, email lists, regulations and policies** which may be of use when planning experiments which might include animals. [A quick overview of all the guidelines can be accessed here](#). Norecopa has written several of these, including [the PREPARE guidelines for planning animal research and testing](#).
- › [NORINA](#): a global overview of audiovisual aids and other items which may be used as **alternatives or supplements to animals in education and training** at all levels from junior school to University, including [dissection alternatives](#) and surgical simulators.
- › [TextBase](#): a global overview of **textbooks and other literature within laboratory animal science** and related topics.
- › [Classic AVs](#): a subset of NORINA covering **audiovisual aids that are based on older technology**.

These databases are updated regularly. [Please give us feedback](#) if you discover errors or omissions.

The Norecopa website also includes four other collections:

- › [NAL](#): a collection of literature references relating to [the 3Rs](#) from the US National Agricultural Library
- › European Commission datasets:
  - ▶ [3Rs Knowledge Sources](#): over 800 resources collected by the Commission in 2016
  - ▶ [3Rs Education and Training Resources](#), over 560 items collected in 2018
  - ▶ [Non-animal models for respiratory tract diseases](#), over 280 models identified in a literature review of over 21,000 publications

links to over 70 other databases

Here is [an alphabetical global list of all the databases](#) cited on the Norecopa website.

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*“the most comprehensive, up-to-date, website for global 3R resources”*



The screenshot shows the norecopa website homepage. The header is blue with the norecopa logo and name. A search bar is in the top right. A navigation menu lists various resources. A list of topics is displayed in the main content area. An orange box highlights statistics: 'over 10,500 webpages', 'nearly 1,000 hits per day', and '7-8 detailed newsletters per year'. The footer includes the website URL and a breadcrumb trail.

**Statistics:**

- over 10,500 webpages
- nearly 1,000 hits per day
- 7-8 detailed newsletters per year

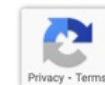
**Website Content:**

- Header:** norecopa logo, NORSK, ENGLISH, Search:
- Navigation Menu:** About Norecopa, Alternatives, Databases & Guidelines, Education & training, Legislation, Meetings, More resources, News, PREPARE, Species, Wiki
- Main Content Area:**
  - Anaesthesia and analgesia | Animal facilities | Animal welfare organisations | Blood sampling | Culture of care | Email discussion lists | Environmental enrichment | Humane endpoints | Literature searches and systematic reviews | Organisations
  - Benefit Assessment | Suppliers
- Footer:** norecopa.no / More resources / Experimental design

## Design and reporting of animal experiments

**norecopa.no**

This page supplements advice given in [Section 4 of the PREPARE guidelines](#). PREPARE covers all aspects of design (including animal and facility related issues).



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[norecopa.no/education-training/films-and-slide-shows](http://norecopa.no/education-training/films-and-slide-shows)



**Rat s.c. injection**  
Norecopa | 1,380 views



**Testing anaesthetic depth in the chicken**  
Norecopa | 598 views



**Blood sam**  
Norecopa



**Rat i.p. injection (method 2)**  
Norecopa | 1,280 views



**Blood collection from the saphenous vein in the mouse**  
Norecopa | 6,777 views



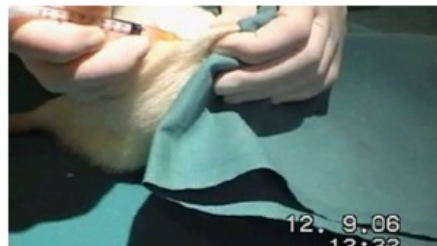
**Blood sam**  
Norecopa



**Subcutaneous injection in the rabbit**  
Norecopa | 1,479 views



**Anatomía de la rata**  
Norecopa | 977 views



**Subcutaneous injection in the rat - Technique 1**  
Norecopa | 2,249 views



**Blood sam**  
Norecopa



**Subcutaneous injection in the chicken**  
Norecopa | 1,806 views



**Lifting a rabbit**  
Norecopa | 2,420 views



**Immobilisation of the rabbit**  
Norecopa | 2,072 views

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## Annual Report for 2024


Norecoba

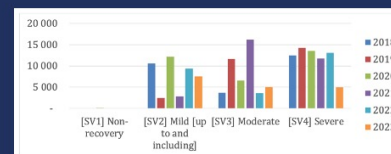


norecoba




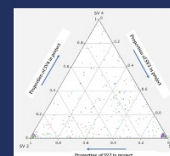


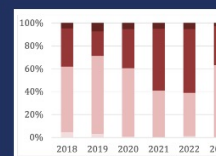




Year	[SV1] Non-recovery	[SV2] Mild (up to and including)	[SV3] Moderate	[SV4] Severe
2018	10000	5000	2000	1000
2019	12000	6000	2500	1500
2020	14000	7000	3000	2000
2021	16000	8000	3500	2500
2022	18000	9000	4000	3000
2023	20000	10000	4500	3500







Year	[SV1] Non-recovery	[SV2] Mild (up to and including)	[SV3] Moderate	[SV4] Severe
2018	40%	30%	20%	10%
2019	42%	32%	21%	11%
2020	44%	34%	22%	12%
2021	46%	36%	23%	13%
2022	48%	38%	24%	14%
2023	50%	40%	25%	15%

Research animal use in Norway from 2018 to 2023:  
A presentation of the official statistics,  
with emphasis on large studies

Antoine Champetier, Adrian Smith & Stéphanie Vuille





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## Systematic reviews of animal studies for evidence-based preclinical research



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Benjamin Victor Ineichen, MD PhD  
University of Zurich  
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adrian.smith@norecoba.no  
info: norecoba.no/sr

## Summer School on Systematic Reviews and Literature Searching, August 2024

Norecoba: PREPARE for better Science

**Guidelines for planning studies *that look as if they may involve animal use***

**PREPARE (2018): Planning Research and Experimental Procedures on Animals: Recommendations for Excellence**

PREPARE covers 15 topics:

**Formulation of the study**

1. Literature searches
2. Legal issues
3. Ethical issues, harm-benefit assessment and humane endpoints
4. Experimental design and statistical analysis

**Dialogue between scientists and the animal facility**

5. Objectives and timescale, funding and division of labour
6. Facility evaluation
7. Education and training
8. Health risks, waste disposal and decontamination

**Methods**

9. Test substances and procedures
10. Experimental animals
11. Quarantine and health monitoring
12. Housing and husbandry
13. Experimental procedures
14. Humane killing, release, reuse or rehoming
15. Necropsy

Items in pink are  
not typically  
highlighted in  
reporting guidelines

# PREPARE

## The PREPARE Guidelines Checklist Planning Research and Experimental Procedures on Animals: Recommendations for Excellence

Adrian J. Smith\*, R. Eddie Clutton\*, Elliot Lilley\*, Kristine E. Aa, Hansert\* & Trond Bratteli\*

\*Norecopa, c/o Norwegian Veterinary Institute, P.O. Box 750 Sentrum, 0106 Oslo, Norway; \*Royal (Dick) School of Veterinary Studies, Easter Bush, Midlothian, EH25 9RG, U.K.; \*Research Animals Department, Science Group, RSPCA, Wilberforce Way, Southwater, Herts, SG13 9RS, U.K.; \*Division of Experimental Biomedicine, Department of Production Animal Clinical Sciences, Faculty of Veterinary Medicine, Norwegian University of Life Sciences, P.O. Box 8148 Dep., 0033 Oslo, Norway; \*Division for Research Management and External Funding, Western Norway University of Applied Sciences, 5020 Bergen, Norway.

PREPARE består av retningslinjer for planlegging av dyreforsøk. Disse komplementerer retningslinjer for rapportering av dyreforsøk, som f.eks. ARRIVE. PREPARE dekker de tre store områdene som bestemmer kvaliteten av arbeidet med å forberede dyreforsøk:

1. Designet av studiet
2. Dialogen mellom forskerne og dyreavdelingen
3. Kvalitetskontroll av de ulike komponentene i studiet

I praksis vil ikke temaene alltid behandles i den rekkefølgen som er presentert her, og enkelte temaer overlapper. PREPARE-sjekklisten kan endres for å ivareta spesielle behov, f.eks. ved feltforsøk. PREPARE inkluderer råd om drift av dyreavdelinger, fordi laboratorieforsøk er helt avhengige av deres kvalitet. Den fulle versjonen av PREPARE er tilgjengelig på Norecopas nettsider, med lenker til globale ressurser, på <https://norecopa.no/PREPARE>.

Fillable Word file that can be used  
to write a Study Plan

	<input type="checkbox"/> Evaluere prosjektets reproduksjonsbarhet og overførbarhet.
2. Juridiske spørsmål	<input type="checkbox"/> Vurdere hvordan forsøket er påvirket av relevant lovgivning for dyreforsøk og andre aktuelle områder som f.eks. dyrefransport og helse, miljø og sikkerhet. <input type="checkbox"/> Finne relevante veiledningsdokumenter (f.eks. EUs retningslinjer for prosjektevaluering).
3. Etske spørsmål, kostnad-nytteanalyse og humane endepunkter	<input type="checkbox"/> Skrive et sammendrag av prosjektet på legmannsspråk. <input type="checkbox"/> I dialog med etiske komiteer, vurdere om uttalelser om denne typen forsøk er allerede blitt produsert. <input type="checkbox"/> Adressere "de 3 R-ene" (Replacement, Reduction, Refinement) og "de 3 S-ene" (Good Science, Good Sense, Good Sensibilities). <input type="checkbox"/> Vurdere forhåndsregistrering av forsøk og publisering av negative resultater. <input type="checkbox"/> Foreta en kostnad-nytteanalyse ("Harm-Benefit Assessment") og diskutere eventuelle lidelser som kan oppstå under forsøket. <input type="checkbox"/> Diskutere læringsmålene dersom dyrene skal brukes i undervisnings- eller treningsøyemed. <input type="checkbox"/> Klassifisere prosjektet etter belastningsgraden. <input type="checkbox"/> Definere objektive, lett målbare og utvetydige humane endepunkter. <input type="checkbox"/> Diskutere behovet (hvis det er noe) for å bruke død som endepunkt for forsøket.
4. Eksperimentelt design og statistisk analyse	<input type="checkbox"/> Vurdere pilotforsøk og diskutere statistisk styrke og signifikansnivåer. <input type="checkbox"/> Definere den eksperimentelle enheten og bestemme antallet forsøksdyr. <input type="checkbox"/> Bestemme metodene for randomisering, forhindre observasjonsskjevheter, og bestemme inklusjons- og eksklusjonskriterier.

Tema	Anbefaling
<b>(B) Dialogen mellom forskerne og dyreavdelingen</b>	
5. Mål og tidshorisont, finansiering og arbeidsfordeling	<input type="checkbox"/> Arrangere møter med alle relevante personell når tidlige planer for prosjektet foreligger. <input type="checkbox"/> Lag en omtrentlig tidsramme for prosjektet, som viser behovene for assistanse med forberedelser, dyrestell, prosedyrer og avfallshåndtering/dekontaminasjon. <input type="checkbox"/> Diskutere og legge frem alle forventede og potensielle kostnader. <input type="checkbox"/> Lage en detaljert plan for fordelingen av både arbeidsoppgavene og utgiftene, på alle stadiene i forsøket.
6. Evaluering av dyreavdelingen	<input type="checkbox"/> Foreta en fysisk inspeksjon av fasilitetene, for å evaluere bygningsmassen, standarden på utstyret og spesielle behov. <input type="checkbox"/> Diskutere bemanningsbehovet ved perioder med ekstra risiko.
7. Utdanning og trening	<input type="checkbox"/> Vurdere den nåværende kompetansen hos personalet og evaluere behovet for videreutdanning og trening før forsøket.
8. Helsefærd, avfallshåndtering og dekontaminasjon	<input type="checkbox"/> I samarbeid med dyreavdelingen, foreta en risikoevaluering som omfatter alle personene og dyrene som er påvirket, direkte eller indirekte, av studiet. <input type="checkbox"/> Evaluere, og om nødvendig produsere, spesifikke retningslinjer for alle stadiene av prosjektet. <input type="checkbox"/> Diskutere metoder for å ivareta, dekontaminere og avhende alt utstyret som skal brukes i studiet.
12. Oppstilling og stell	<input type="checkbox"/> Ta hensyn til dyrenes spesifikke instruksjoner og behov, i samråd med eksperter. <input type="checkbox"/> Diskutere akklimatisering, optimale oppstillingsforhold og prosedyrer, miljøfaktorer og eventuelle begrensninger på disse (f.eks. fasting eller oppstilling i enebur).
13. Eksperimentelle prosedyrer	<input type="checkbox"/> Utvikle optimale metoder for fangst, immobilisering, merking og frisetting eller omplussing. <input type="checkbox"/> Utvikle optimale metoder for å gi dyrene behandling, samt for prøvetaking, sedasjon og anestesi, kirurgi og andre inngrep.
14. Human avlivning, frisetting eller omplussing	<input type="checkbox"/> Konsultere relevant lovgivning og retningslinjer i god tid før studiet. <input type="checkbox"/> Definere de primære metodene for avlivning, samt metoder som kan brukes i en nødsituasjon. <input type="checkbox"/> Evaluere kompetansen til personene som må foreta disse handlingene.
15. Obduksjon	<input type="checkbox"/> Lage en systematisk plan for alle stadiene i obduksjonen, inkl. hvor den skal foregå, og identifikasjon av alle dyrene og prøvene som tas.

### Referanser

1. Smith AJ, Clutton RE, Lilley E, Hansen KEA & Bratteli T. PREPARE: Guidelines for Planning Animal Research and Testing. *Laboratory Animals*, 2017. DOI: 10.1177/0023677217724823.
2. Kilenny 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.

### Mer informasjon

<https://norecopa.no/PREPARE> | [post@norecopa.no](mailto:post@norecopa.no) | [@norecopa](https://twitter.com/norecopa)

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3-Ethical issues, harm-benefit assessment and humane endpoints	
3a	Construct a lay summary.
3b	In dialogue with ethics committees, consider whether statements about this type of research have already been produced.
3c	Address the 3Rs (Replacement, Reduction, Refinement) and the 3Ss (Good Science, Good Sense, Good Sensibilities).
Assessment and justify any likely animal harm.	
3f	Discuss the learning objectives, if the animal use is for educational or training purposes.
3g	Allocate a severity classification to the project.
3h	Define objective, easily measurable and unequivocal humane endpoints.
3i	Discuss the justification, if any, for death as an end-point.
4-Experimental design and statistical analysis	

- Have the experiments been carried out before, and is any repetition justifiable?
- What [approaches to reduce distress](#) have been considered?

### 3a Construct a lay summary.

General principles For fish researchers

- Have national or local research ethics committees already produced statements relevant to the research being planned? Consideration should also be paid to the broader context of the research. For example, research directed at increasing the productivity of farming at the expense of (or without improving) individual animal welfare, or wildlife research whose primary aim is population management.

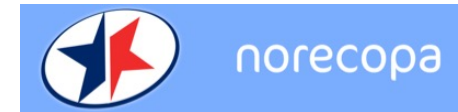
Links to quality guidelines and scientific papers worldwide on e.g. blood sampling, injection volumes, housing and husbandry, analgesia, humane endpoints, experimental design

- Will any advances in this research be published, or will the results only index the title and abstract? Will the results be rejected?
  - Have the Three S's ([Good Science, Good Sense and Good Sensibilities](#)) been addressed? Sufficient time should be allocated to this point, since two of the three S's are highly subjective, but equally important. The use of commonsense and critical anthropomorphism are justifiably part of the work to assess the impact of research on animals, not least when a scientific evidence base does not exist.
  - Does the proposed study have a clear rationale and scientific relevance, and what will be the next step if the hypothesis is supported or rejected?
  - Have the experiments been carried out before and is any repetition justifiable?
  - What [approaches to reduce distress](#) have been considered?
  - Will the project undergo [pre-registration](#) and will negative results be published, to avoid publication bias?
- Many more [links to resources on ethics are available here](#).
- Details about pre-registration of animal studies and reporting of critical incidents are to be found in the section on [Experimental Design and Statistical Analysis](#).

Harm-Benefit Assessment



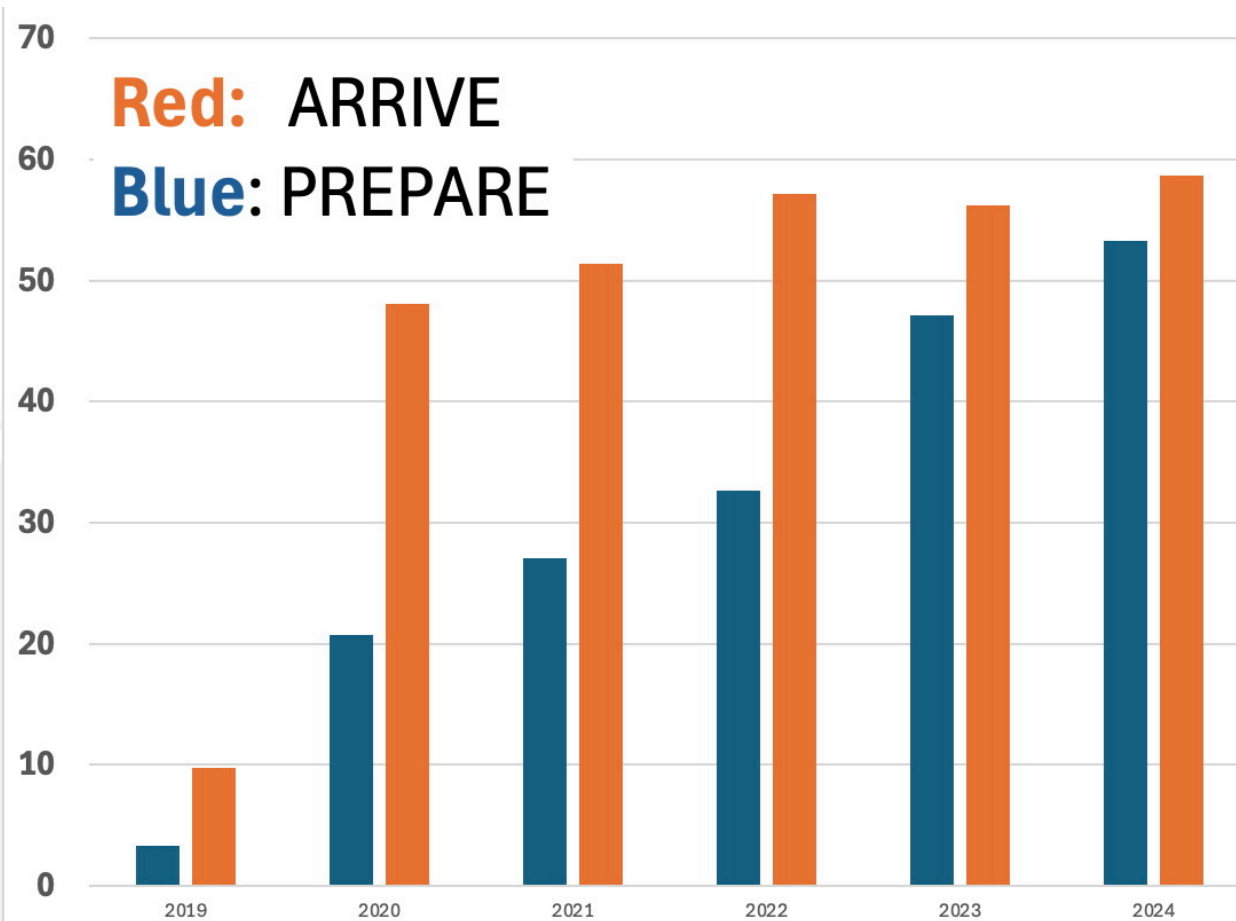
*Stating the obvious: Replacement must be considered from day 1 of planning*



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[norecopa.no/PREPARE](https://norecopa.no/PREPARE) and  
[ivd-utrecht.nl/en/news/better-animal-research-through-open-science-1](https://ivd-utrecht.nl/en/news/better-animal-research-through-open-science-1)

## Percentage of UK Non-Technical Summaries citing ARRIVE & PREPARE



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PREPARE		Endorsements
PREPARE checklist		Please <a href="#">contact Norecopa</a> if you know of endorsements that are not on this list. See also the page of <a href="#">general endorsements for Norecopa's work</a> .
Comparison with ARRIVE		
Endorsements		<b>Accreditation Bodies, Funders and Regulatory Authorities</b> <ul style="list-style-type: none"><li>&gt; The PREPARE guidelines are featured on the <a href="#">List of Resources for Investigators</a> produced by <a href="#">AAALAC International</a> (Association for the Assessment and Accreditation of Laboratory Animal Care), who have accredited over 1,100 animal facilities worldwide.</li><li>&gt; PREPARE is highlighted by the UK Home Office in their <a href="#">Guidance Notes for Project Licence Applications (February 2024, page 13)</a>. The same text is to be found in the ASPeL Project Licence Application online Template, <a href="#">available here</a> on the website of the Department of Health, Northern Ireland (under point D7.9, page 29). These provide part of their <a href="#">collection of guidance for the regulated community on animal research and testing</a>.</li><li>&gt; The Non-Technical Summaries of all projects approved by the UK Home Office <a href="#">in the period January-September 2024</a> showed that, of 283 projects, 153 (54%) state explicitly that they use resources from Norecopa, the vast majority of these mentioning PREPARE specifically.</li><li>&gt; The <a href="#">Association of Medical Research Charities (AMRC)</a> in the UK <a href="#">asks grantholders to make use of the PREPARE guidelines</a> when planning experiments.</li><li>&gt; <a href="#">Cancer Research UK</a> cites PREPARE as <a href="#">a source of information in connection with their policy</a> on the use of animals in research.</li><li>&gt; PREPARE is cited in a Report by the Advisory Committee to the Director (ACD) of the NIH entitled "<a href="#">ACD Working Group on Enhancing Rigor, Transparency, and Translatability in Animal Research</a>", published on 11 June 2021. The Report <i>cites PREPARE as one of the ways to 'strengthen the critical elements across the life of a study, from planning to execution and publication, which will result in a higher quality knowledge base and will better inform future research'</i>.</li><li>&gt; PREPARE is cited by the <a href="#">Senate Commission on Animal Protection and Experimentation</a> of the central independent <a href="#">German Research Foundation</a> (DFG) in its Guidance on the 3Rs and the validity of animal experiments (in <a href="#">German</a> and in <a href="#">English</a>). The Commission advises the statutory bodies of the DFG as well as policy-makers and government agencies. In its advisory capacity, it also makes its expertise available to researchers, universities and research institutions.</li></ul>
Film		
1-Literature searches	▼	
2-Legal issues	▼	
3-Ethical issues, harm-benefit assessment and humane endpoints	▼	
4-Experimental design and statistical analysis	▼	
5-Objectives and timescale, funding and division of labour	▼	
6-Facility evaluation	▼	
7-Education and training	▼	
8-Health risks, waste	▼	

## April 2025

- › [Ex vivo, de novo & in silico models in biomedical research](#), Stuttgart, 1-2 April 2025
- › [EBVS Congress](#), Belgrade, 2-4 April 2025
- › [The Transparent Transition - The future of animal and animal-free research](#), Amsterdam, 3 April 2025
- › [From crisis to opportunity - systematic heterogenization as a tool to improve reproducibility and reduce animal use](#), webinar (Helene Richter), 8 April 2025
- › [1st Finnish Culture of Care Symposium](#), Helsinki, 9 April 2025
- › [Antibodies and Beyond: The Power of Animal-Free, Recombinant Antibodies](#), webinar (Esther Wenzel), 9 April 2025
- › [Meeting the Requirements of the US Animal Welfare Act](#), workshop, 9-10 April 2025
- › [17th Minipig Research Forum](#), Amsterdam, 9-11 April 2025

## + webpages for recorded meetings, including a page sorted by the PREPARE topics

- › [How to convince your colleagues to work under aseptic conditions](#), EFAT/ESLAV webinar (Bertrand Lussier), 10 April 2025
- › [Stress-reduced handling of rats and mice](#), webinar (Therése Ahlström), 11 April 2025
- › [41st LAMA/ATA Annual Conference](#), Fort Walton Beach, 14-17 April 2025
- › [Environmental Monitoring & Database Management](#), webinar (Zoltan Varga & TBC), 18 April 2025
- › [Course in Fish Diseases part 1](#), Copenhagen, 21-25 April 2025
- › [3Rs Sharing Conference](#), Seattle, 23 April 2025
- › [46th Annual BCLAS Symposium: Stress and emotions in animals](#), Namur, 23-24 April 2025
- › [Replication of null results: Absence of evidence or evidence of absence?](#), webinar (Samuel Pawel), 29 April 2025
- › [All you ever wanted to know about registered reports](#), webinar (Nonia Pariente), 30 April 2025





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## Clicker training

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)<sup>[1]</sup>. The *click* bridges the time between the desired behavior and the presentation of the reward<sup>[1]</sup>. 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 training of their cage mates<sup>[2]</sup>.

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<sup>[3]</sup>

**Rats:** following a target stick, voluntarily change to a cage, observational learning<sup>[2]</sup>

**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<sup>[4]</sup>.



**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.

- <sup>1</sup> <sup>1.0</sup> <sup>1.1</sup> 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 [↗](#).
- <sup>2</sup> <sup>2.0</sup> <sup>2.1</sup> 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 [↗](#).
- <sup>3</sup> Leidinger, Charlotte; Hermann, 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 [↗](#).
- <sup>4</sup> "Positive Reinforcement Training in Large Experimental Animals" [↗](#) (PDF).

Experts for clicker training in mice and rats: [TARC](#) [↗](#), Mainz, Germany

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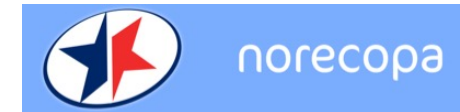
*SCID-Hu mice immunized with a pneumococcal vaccine produce specific human antibodies and show increased resistance to infection.*

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

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*Culture of Care*

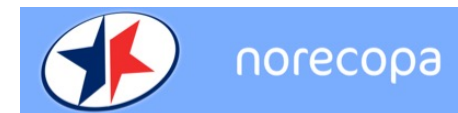
Norecopa hosts The International Culture of Care Network  
[norecopa.no/coc](http://norecopa.no/coc)

A demonstrable commitment, throughout the establishment, to improving:

- animal welfare
- scientific quality
- care of staff
- transparency for all stakeholders, including the public

*It goes beyond simply complying with the law!*

Norecopa: PREPARE for better Science



## Communication and the Culture of Care

Penny Hawkins, RSPCA Research Animals Department  
on behalf of the International Culture of Care Network\*

Effective two-way communication between scientists and animal technologists is essential for a good Culture of Care  
The European Commission suggests the 'development of formal and informal communication channels, for mutual benefit with respect to science and animal welfare'  
Here are some examples from International Culture of Care network members

### Regular meetings

**Scheduled meetings** for scientists, animal technologists, vets, unit managers and AWERB members



**Regular refresher/update meetings** for all organised by NTCO



### Special events

**Duo-talks:** researcher talks about their science, and animal technologists talk about techniques and animal care within the project



**ELH** organises an **informal meeting** for all, in which anyone can raise welfare issues



### Building communication into existing processes

Each study has a **pre-start** and **wash-up** meeting involving everybody



Three Rs improvements reported to AWERB & shared at external user meetings

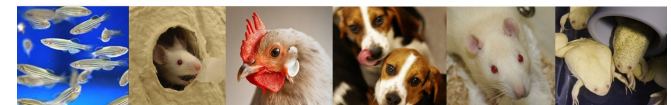


### Other ideas

A **'boxless' event:** anyone can submit 'out of the box' ideas to improve practice



A **staff survey** for all e.g. how much do you agree with statements such as 'in our group we listen to each others' ideas about animal welfare'



\*[norecopa.no/culture-of-care](http://norecopa.no/culture-of-care)



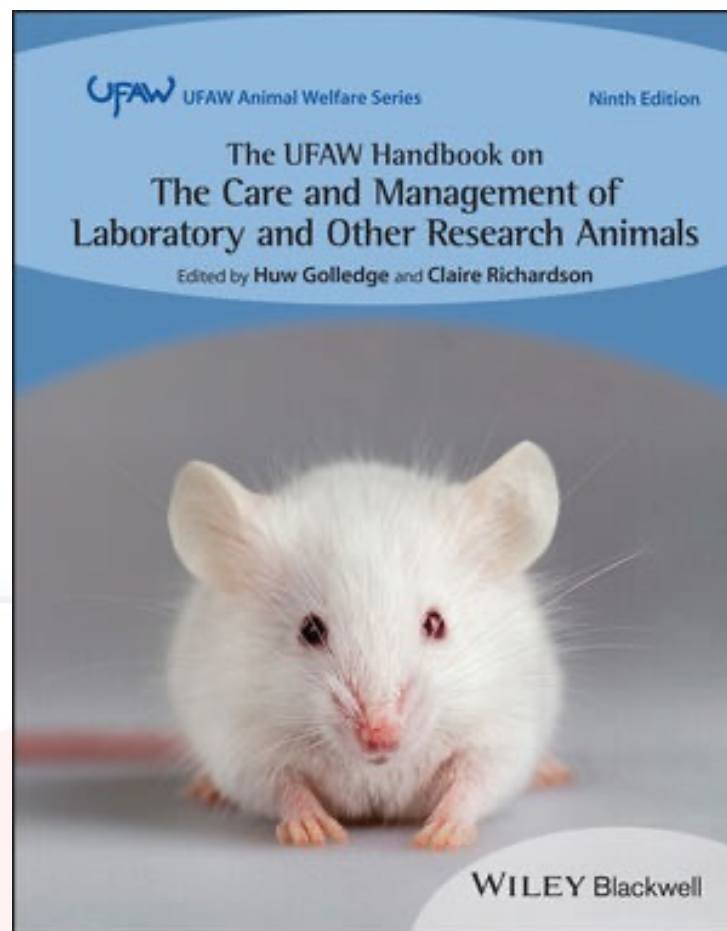
approx 60 members in 14 countries  
 meetings sponsored by Norecopa at FELASA, in Prague (2019) & Athens (2025)



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[norecopa.no/global3r](https://norecopa.no/global3r)

AJ Smith & J Richmond:  
The Three Rs



## **The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals, 9th Edition, 2024**

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*40-slide powerpoint presentation*



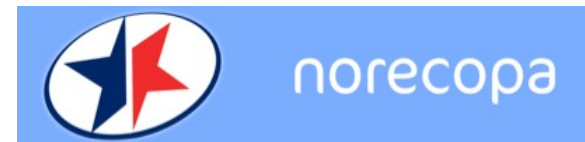
ccac.ca

# ***The 3Rs of Russell and Burch:*** **Replacement, Reduction & Refinement**

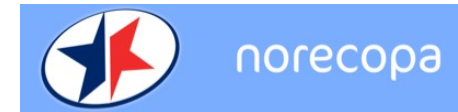
Available at [norecopa.no/3Rs](https://norecopa.no/3Rs)

*With some material from:*

Smith AJ & Richmond J (2024). The Three-Rs.  
In: *The UFAW Handbook on the Care and Management  
of Laboratory and Other Research Animals*. 9<sup>th</sup> edition.  
Richardson CA and Golledge HDR (eds).  
Oxford: Wiley-Blackwell.



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## Les 3Rs de Russell et Burch:

### Remplacement, Réduction & Raffinement

Adrian Smith

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[@adrian\\_3r](https://twitter.com/adrian_3r)

Informations tirées de :  
Smith AJ & Richmond J (2024). The Three Rs.  
In: *The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals*. 9<sup>th</sup> edition.  
Richardson CA and Golledge HDR (eds).  
Oxford: Wiley-Blackwell.

Ces diapositives sont disponibles sur [norecopa.no/3Rs](https://norecopa.no/3Rs)

version 12.03.24



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## Das 3R-Prinzip von Russell und Burch:

### Replacement, Reduction & Refinement (Ersetzen, Reduzieren & Verbessern)

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[@adrian\\_3r](https://twitter.com/adrian_3r)

Mit Auszügen aus:  
Smith AJ & Richmond J (2024). The Three Rs.  
In: *The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals*. 9<sup>th</sup> edition.  
Richardson CA and Golledge HDR (eds).  
Oxford: Wiley-Blackwell.

Diese Folien sind verfügbar unter [norecopa.no/3Rs](https://norecopa.no/3Rs)

Version vom 12.03.24

Vielen Dank an Boris Jerchow (GV-SOLAS) und Andrina Zbinden & Paulin Jirkof (Swiss 3RCC) für die deutsche Übersetzung.



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## Las 3Rs de Russell y Burch:

### Reemplazo, Reducción y Refinamiento

Adrian Smith

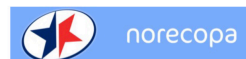
[adrian.smith@norecopa.no](mailto:adrian.smith@norecopa.no)  
[@adrian\\_3r](https://twitter.com/adrian_3r)

Con algunos materiales de:  
Smith AJ & Richmond J (2024). The Three Rs.  
In: *The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals*. 9<sup>th</sup> edition.  
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version 12.03.24

Versión en español 16.01.23 Rafael Hernández, UNAM



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Traducido con autorización de Adrian Smith



## Princip 3R Russella a Burche:

### Replacement, Reduction & Refinement

Adrian Smith

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[@adrian\\_3r](https://twitter.com/adrian_3r)

S přispěním:  
Smith AJ & Richmond J (připravuje se). The Three-Rs.  
In: *The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals*. 9<sup>th</sup> edition.  
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Prezentace je dostupná na [norecopa.no/3Rs](https://norecopa.no/3Rs)

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[norecopa.no/3Rs](https://norecopa.no/3Rs)

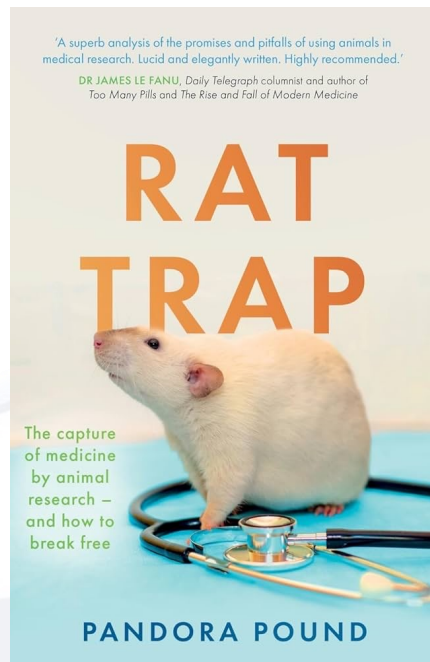
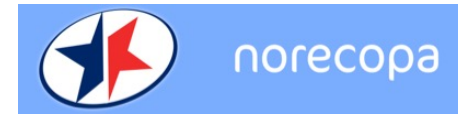
## Norecopa's annual 3R Prize – NOK 30,000 + diploma



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# ***“Respectful dialogue”?***



Scientists who have built their career on an animal model

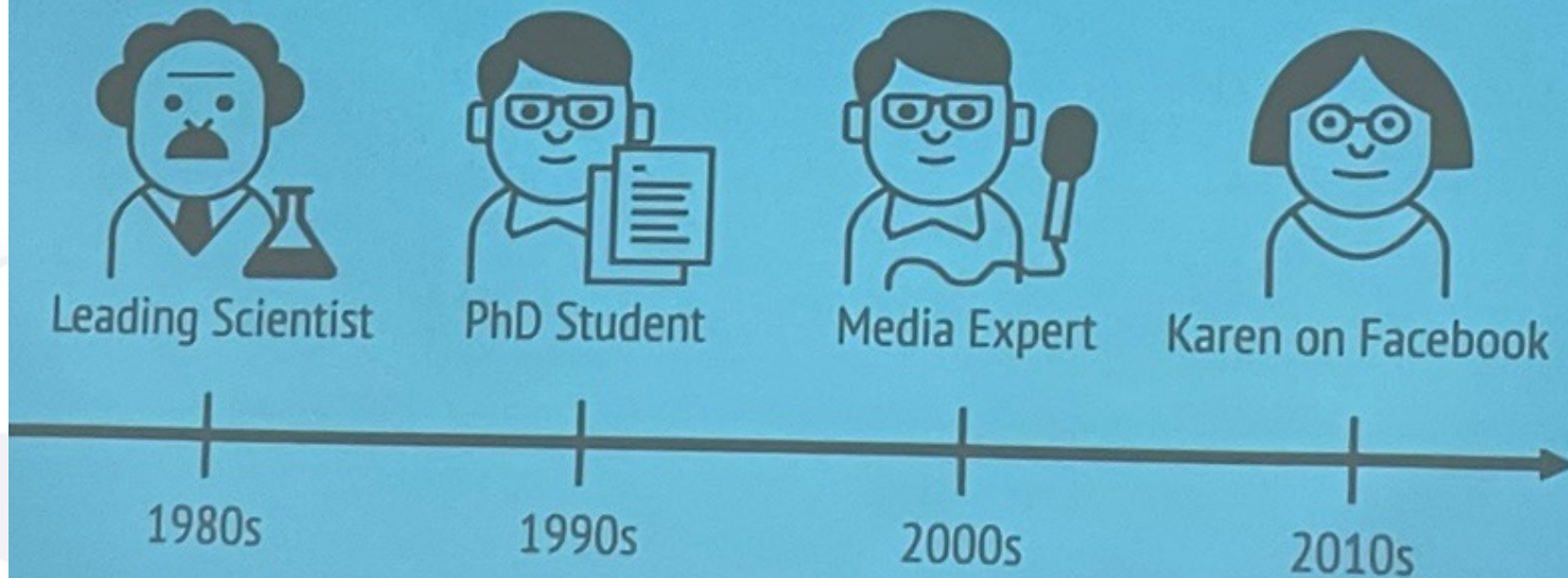
- refined
- humanised (genetically altered)
- validated
- where previous data is available

**“Animal testing” and “animal research” are often used indiscriminatively, even though the potential for animal replacement is very different**



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## RECOGNIZED EXPERTS OVER TIME



colourbox.com

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[norecopa.no/poster](http://norecopa.no/poster)

Free to download, use  
and distribute

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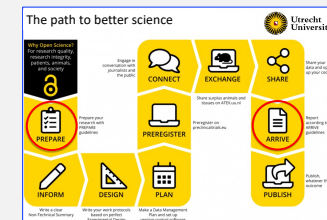
Adrian Smith, Norecopa, c/o Norwegian Veterinary Institute, P.O. Box 64, 1431 Ås, Norway  
[adrian.smith@norecopa.no](mailto:adrian.smith@norecopa.no)

### What's the problem?

Preclinical *in vivo* research needs to be reproducible and translatable, while maximising the animals' welfare and replacing them with alternatives wherever possible. This can be summed up in the 3Rs of Russell & Burch: **Replace, Reduce & Refine**.



Scientists are usually well aware of **reporting** guidelines when publishing research. These are important, but a sub-standard study, like a burnt cake, cannot be improved by a better description. Guidelines for **planning**, although not mandatory, are of great help in designing better experiments.



[norecopa.no/PREPARE](http://norecopa.no/PREPARE)

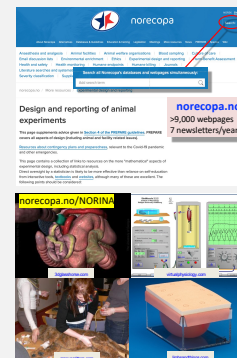
### What can Norecopa offer?

Norecopa maintains a comprehensive database of resources for scientists, which include:



- over 9,000 searchable webpages of quality 3R resources, with filters to facilitate searching
- the PREPARE guidelines for planning animal experiments, with a checklist in over 30 languages
- links to recordings of webinars covering all aspects of animal research
- an International Webinars & Meetings Calendar
- a collection of over 400 guidelines for planning and conducting animal research
- an English-language newsletter with the latest developments within the 3Rs
- the NORINA database of alternatives to animal use in education and training
- a slide set describing the 3R concept in detail: [norecopa.no/3Rs](http://norecopa.no/3Rs)
- a Refinement Wiki

### Examples of Norecopa's resources:



- PREPARE covers:**
- ✓ Formulation of a study
  - ✓ Dialogue between scientists and the animal facility
  - ✓ Quality control of the components in the study



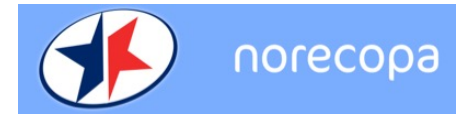
The Refinement Wiki  
[wiki.norecopa.no](http://wiki.norecopa.no)

Norecopa gratefully acknowledges financial support from:

The Norwegian Parliament, the Ministry of Agriculture & Food and the Ministry of Trade, Industry & Fisheries; the Nordic Society against Painful Experiments (NSMSD), Novo Nordisk, the Norwegian Animal Protection Alliance (Dyrevvernalliansen), the Norwegian Society for Protection of Animals (Dyrebeskyttelsen Norge), the Research Council of Norway, Laboratory Animals Ltd., the Royal Society for the Prevention of Cruelty to Animals (RSPCA), Sanofi, the Scottish Accreditation Board, the Stiansen Foundation, the Universities Federation of Animal Welfare (UFAW) and the US Department of Agriculture (USDA).

Toolbox graphic: colourbox.com





## Thanks to Norecoba's sponsors

Standing Committee on Business Affairs, Norwegian Parliament  
Norwegian Ministries of Agriculture and Fisheries  
Research Council of Norway

Aivero  
Architect Finn Rahn's Legacy  
Laboratory Animals Ltd.  
Nordic Society Against Painful Experiments (NSMSD)  
Norwegian Society for Animal Protection (Dyrebeskyttelsen Norge)  
Norwegian Animal Protection Alliance (Dyrevernalliansen)

Novo Nordisk  
PHARMAQ  
Royal Society for the Prevention of Cruelty to Animals (RSPCA)  
Sanofi  
Scand-LAS  
Scottish Accreditation Board (SAB)  
Stiansen Foundation  
Universities Federation for Animal Welfare (UFAW)  
US Department of Agriculture (USDA)

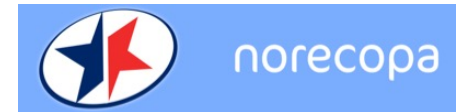


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Dyrevernalliansen

Graphics: colourbox.com

*Thank you for listening and for the award!*



**[norecopa.no/220425](https://norecopa.no/220425)**

**English-language newsletters**

A screenshot of the Norecopa website footer, which has a blue background with white text. The footer is organized into several columns. The first column on the left contains contact information and social media links. The second column contains the street and postal addresses. The third column contains a list of shortcuts. The fourth column contains a newsletter subscription form, which is circled in red. The fifth column contains information about resources developed in collaboration with other organizations. The bottom of the footer features logos for the USDA and the Norwegian Environment and Food Research Institute.

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