

Alternative approaches: drivers and visions the National 3R Centre perspective

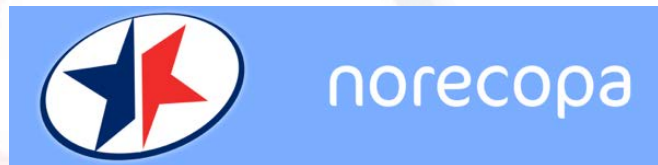
norecopa.no/EPAA

Adrian Smith
adrian.smith@norecopa.no

"The opinions expressed here are my own and not necessarily those of Norecopa"

Norecopa

Norway's National Consensus Platform for the
Three Rs: Replacement, Reduction and Refinement
and a source of global 3R resources



<https://norecopa.no>

Norecopa: PREPARE for better Science

European Consensus-Platform for Alternatives

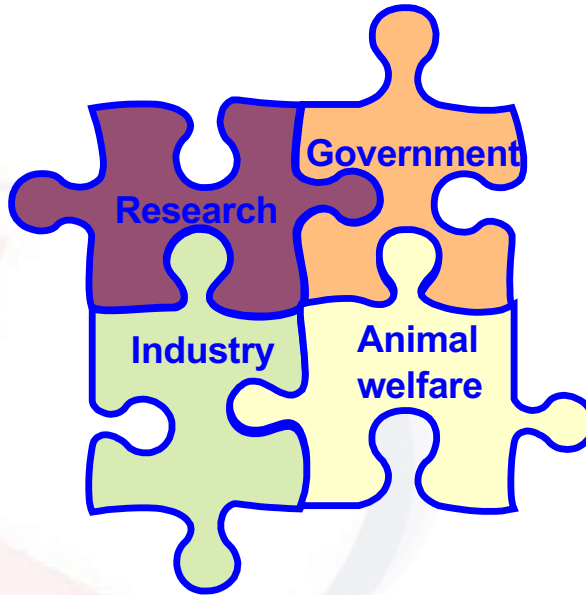
ecopa.eu



ecopa supports the establishment of National Consensus Platforms (NCPs) where all 4 stakeholders are equally represented in the governing body:

Founding Members:

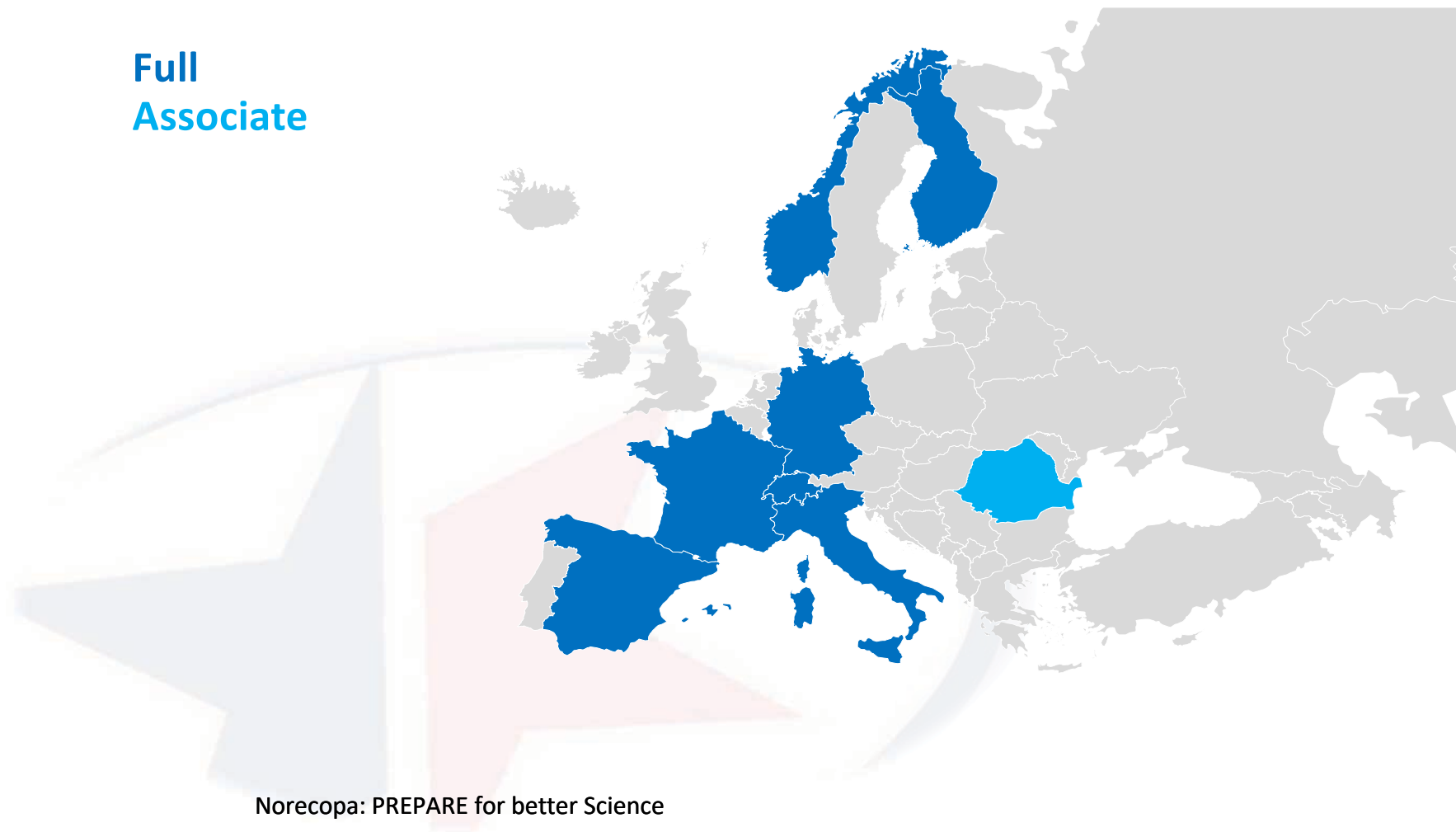
Denmark
Finland
France
Germany
Italy
Norway
Spain
Sweden



Norecopa: PREPARE for better Science

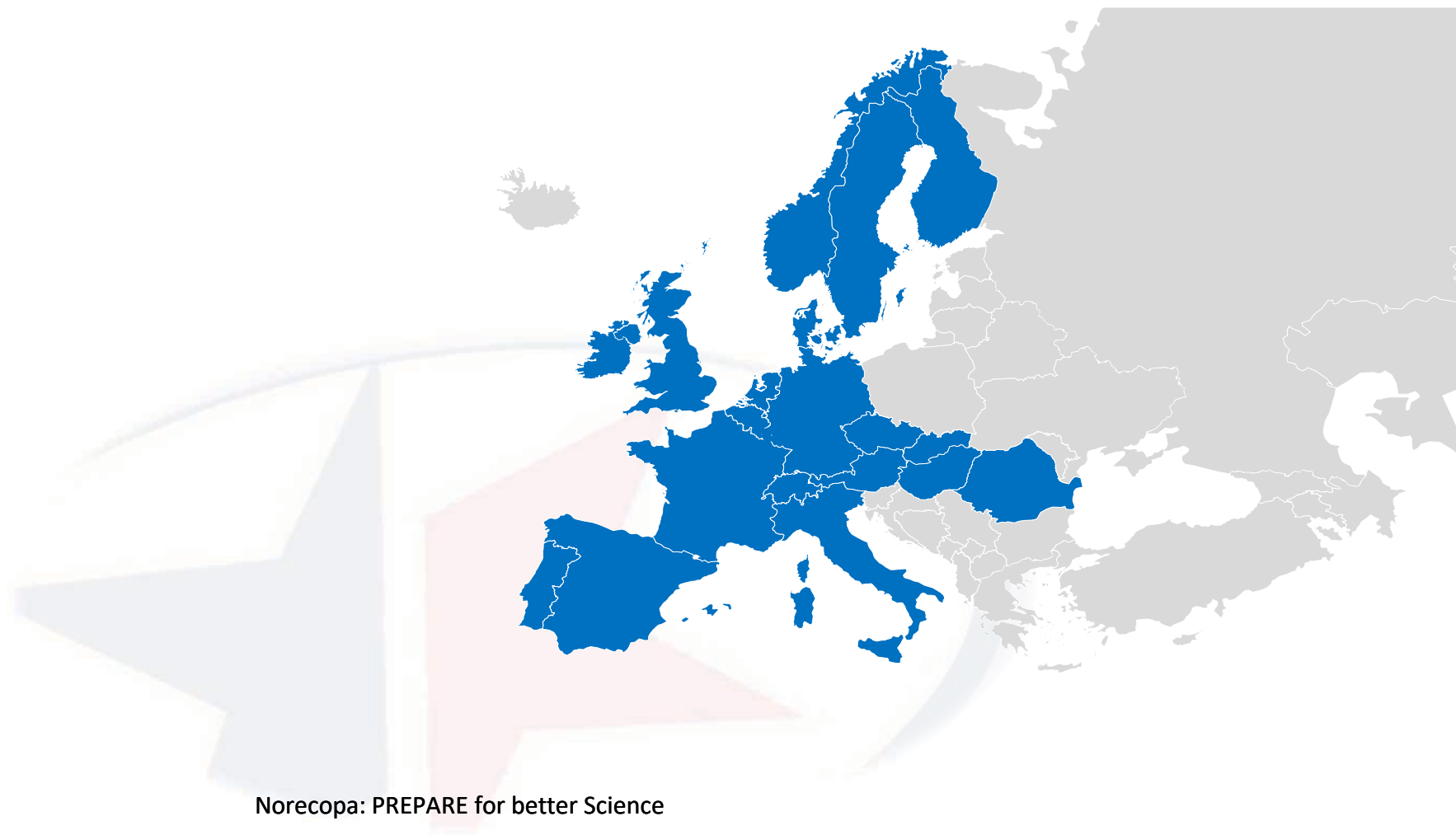
Members of ecopa today

Full
Associate



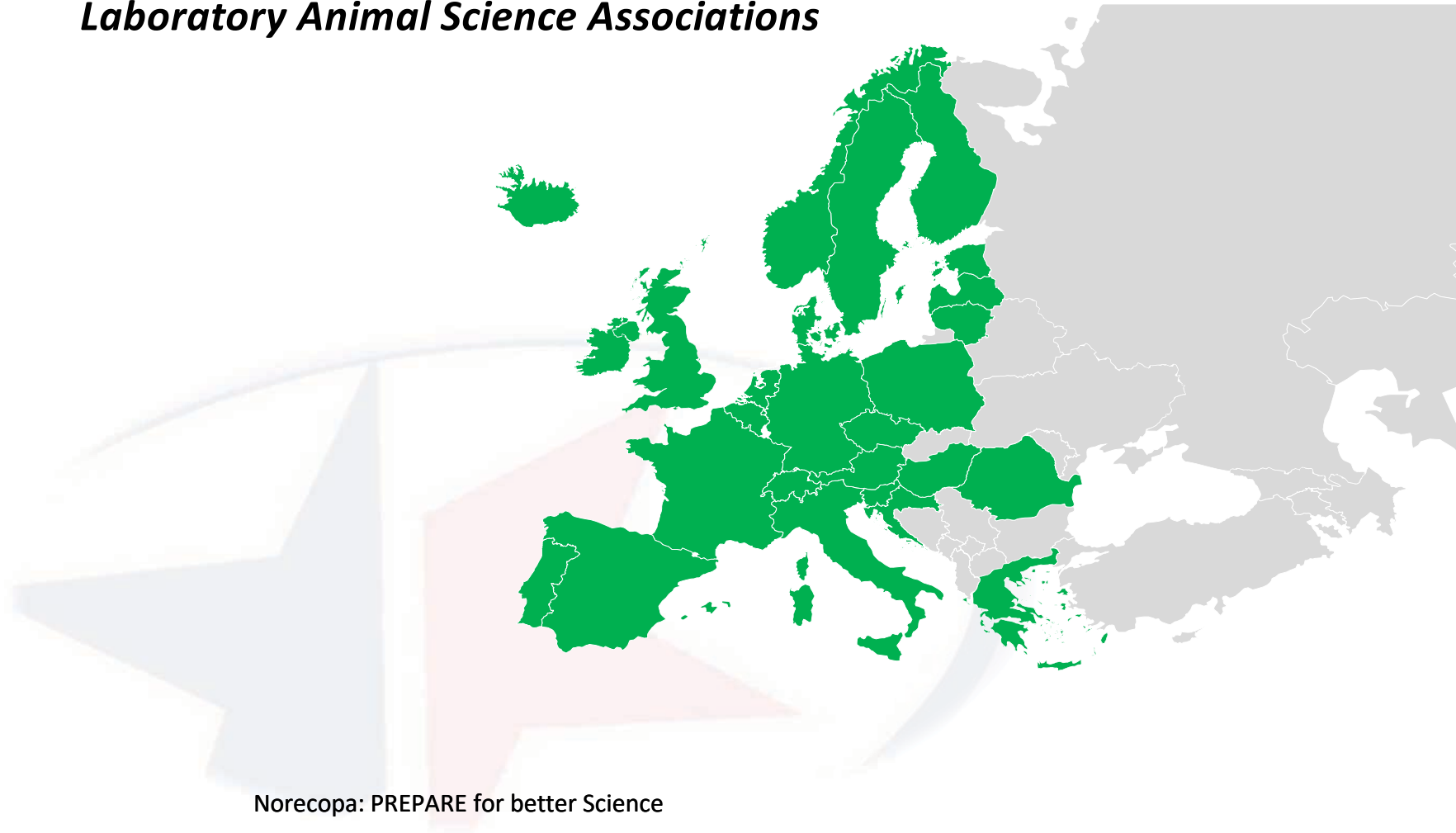
Norecopa: PREPARE for better Science

Countries with 3R Centres



Norecopa: PREPARE for better Science

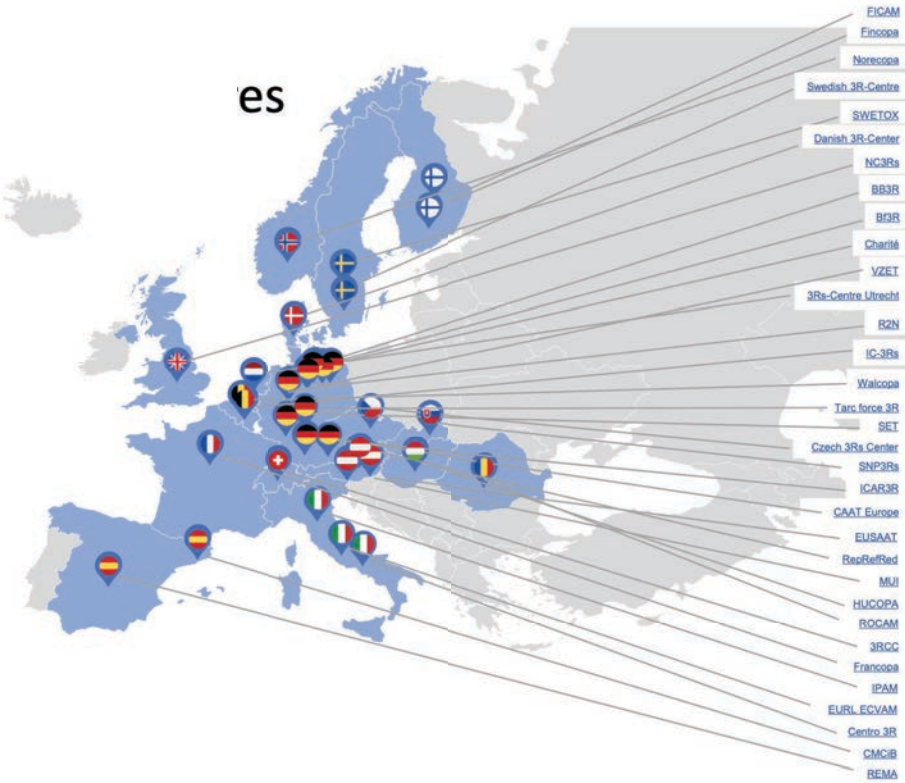
***Countries with/affiliated to
Laboratory Animal Science Associations***



Norecopa: PREPARE for better Science

European network of 3R Centres established in 2018
- many with money for 3R research

Interactive map:
norecopa.no/3REuropeOverview



Please note that some of these Centres, such as EURL ECVAM, serve more than the country in which they have been placed.
 This overview has been compiled by Norecopa. Please report any errors or send suggestions for additions to post@norecopa.no
 Designed by PresentationGo.com. Flags from flaticon.com



LINZ 2018
21st European Congress on Alternatives to Animal Testing

EUSAAT 2018
18th Annual Congress of EUSAAT

EUSAAT
European Society for
Alternatives to Animal Testing
The European 3Rs Society

www.eusaat-congress.eu

23 – 26 September 2018 – University of Linz, Austria



Winfried Neuhaus

Horst Spielmann & Monica Schäfer-Korting
3R Centre meeting in March 2019





*ALTEX preprint
published October 19, 2020
doi:10.14573/altex.2010061*

Letter

**Consensus Statement from the European Network of 3R Centres
(EU3Rnet)**

*Winfried Neuhaus**

- Promoting Non-Animal Methods as well as Replacements
- Encouraging dissemination within the network
- Involving all members of the research community

These statements are well aligned with the 6 challenges described in
EPAA's Action Programme for 2021-2025

...consider the range of non-
...necessarily use of animal experimentation. When a relevant *non-animal method* or
*alternative replacement method*³ to an animal model does *not* exist, the possibilities for *Reduction* and *Refinement* of the model
must be examined.

EU3Rnet considers it important that internationally relevant national efforts to develop and promote the 3Rs and *non-animal methods* are disseminated within the network. The network will disseminate such information to its members, who in turn will disseminate the information further through their communication channels (which include websites, newsletters, symposia, training activities, annual reports and other channels).

EU3Rnet will emphasize the importance of involving all members of the research animal community in these efforts to develop and disseminate 3R resources. These include animal carers, technologists, veterinarians, teachers, lecturers and scientists.

All of the 3R centres in EU3Rnet pledge themselves to prioritization of their dissemination efforts. Whenever possible, they will use publically available platforms to disseminate this knowledge, in order to maximize exposure.

Preparing an application for a COST Action

Working title: *3Rs for better Science*

A contribution towards the efforts to meet the reproducibility crisis,
by applying methods developed within the 3Rs field

Working groups focusing on

- Dissemination
 - Quality and translatability of science
 - Implementation and Education
- with ethics integrated into each of these areas

- Closing the gaps between current EU projects
- Ensuring that basic research is also covered, i.e. not just a focus on testing

*ECVAM meeting in 1999:
Belgium, Germany and the Netherlands*

**World Congresses on Alternatives and Animal Use in
the Life Sciences**



Maastricht

*3R Centre meetings arranged by ECVAM
in 2015 og 2016*

Norecopa: PREPARE for better Science

10th World Congress
August 20-24, 2017
Seattle, Washington, USA

9th World Congress
August 24-28, 2014
Prague, Czech Republic

8th World Congress
August 21-25, 2011
Montreal, Canada

7th World Congress
August 30 – September 3, 2009
Rome, Italy

6th World Congress
August 21-25, 2007
Tokyo, Japan

5th World Congress
August 21-25, 2005
Berlin, Germany

4th World Congress
August 11-15, 2002
New Orleans, Louisiana, USA

3rd World Congress
August 29 – September 2, 1999
Bologna, Italy

2nd World Congress
October 20-24, 1996
Utrecht, Holland

1st World Congress
November 14-19, 1993
Baltimore, Maryland, USA



workshop about national platforms

norecopa.no



norecopa

NORSK ENGLISH

Search:

About Norecopa | Alternatives | Databases & Guidelines | Education | Legislation | Meetings | More resources

[Anaesthesia and analgesia](#) | [Animal facilities](#) | [Animal welfare organisations](#) | [Blood](#)
[Email discussion lists](#) | [Environmental enrichment](#) | [Ethics](#) | [Experimental design and](#)
[Harm-Benefit Assessment](#) | [Health and safety](#) | [Health monitoring](#) | [Humane endpoi](#)
| [Literature searches and systematic reviews](#) | [Organisations](#) | [Reporting guidelines](#)
[Suppliers](#)

1.  United States
2.  United Kingdom
3.  Canada
4.  India
5.  Norway
6.  Spain
7.  Australia
8.  Germany
9.  Brazil
10.  France

over 9,000 webpages
over 300,000 hits / year

norecopa.no / [More resources](#)

Norecopa: PREPARE for better Science

"The Reproducibility Crisis"



NATURE | NEWS

Swiss survey highlights potential flaws in animal studies

Why Most Published Research Findings Are False

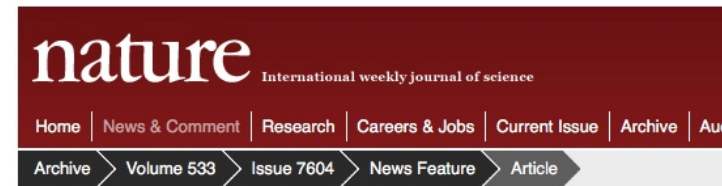
John P. A. Ioannidis

Published: August 30, 2005 • <https://doi.org/10.1371/journal.pmed.0020124>

Avoidable waste in the production and reporting of research evidence

Iain Chalmers, DSc • Prof Paul Glasziou, RACGP

Published: June 15, 2009 • DOI: [https://doi.org/10.1016/S0140-6736\(09\)60329-9](https://doi.org/10.1016/S0140-6736(09)60329-9)



NATURE | NEWS FEATURE

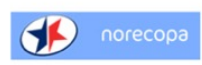
1,500 scientists lift the lid on reproducibility

More than 70% of researchers have tried and failed to reproduce another scientist's experiments, and more than half have failed to reproduce their own experiments. Those are some of the telling figures that emerged from *Nature's* survey of 1,576 researchers who took a brief online questionnaire on reproducibility in research.

Norecopa: PREPARE for better Science



PREPARE



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

Adrian J. Smith¹, R. Eddie Clutton², Elliot Lilley³, Kristine E. Aa. Hansen⁴ & Trond Bratteid⁵
¹Norecopa, c/o Norwegian Veterinary Institute, P.O. Box 750 Sentrum, 0106 Oslo, Norway; ²Royal (Dick) School of Veterinary Studies, Easter Bush, Midlothian, EH25 9RG, U.K.; ³Research Animals Department, Science Group, RSPCA, Wilberforce Way, Southwater, Horsham, West Sussex, RH13 9RS, U.K.; ⁴Section 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; ⁵Division for Research Management and External Funding, Western Norway University of Applied Sciences, 5020 Bergen, Norway.

PREPARE¹ consists of planning guidelines which are complementary to reporting guidelines such as ARRIVE². 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 in the checklist can be adapted to meet special needs, such as field studies. PREPARE includes guidance on facilities, since in-house experiments are dependent upon their quality. The full version of the guideline 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.

Three Rs!

Topic	Recommendation
(A) Formulation of the study	
1. Literature searches	<input type="checkbox"/> Form a clear hypothesis, with primary and secondary outcomes. <input type="checkbox"/> Consider the use of systematic reviews. <input type="checkbox"/> Decide upon databases and information specialists to be consulted, and construct search terms. <input type="checkbox"/> Assess the relevance of the species to be used, its biology and suitability to answer the experimental questions with the least suffering and to welfare needs. <input type="checkbox"/> Assess the reproducibility and translatability of the project.
2. Legal issues	<input type="checkbox"/> Consider how the research is affected by relevant legislation for animal research and other areas, e.g. animal transport, occupational health and safety. <input type="checkbox"/> Locate relevant guidance documents (e.g. EU guidance on project evaluation).
3. Ethical issues, harm-benefit assessment and humane endpoints	<input type="checkbox"/> Construct a lay summary. <input type="checkbox"/> In dialogue with ethics committees, consider whether statements about this type of research have already been produced. <input type="checkbox"/> Address the 3Rs (replacement, reduction, refinement) and the 3Ss (good science, good sense, good sensibility). <input type="checkbox"/> Consider pre-registration and the publication of negative results. <input type="checkbox"/> Perform a harm-benefit assessment and justify any likely animal harm. <input type="checkbox"/> Discuss the learning objectives, if the animal use is for educational or training purposes. <input type="checkbox"/> Allocate a severity classification to the project. <input type="checkbox"/> Define objective, easily measurable and unequivocal humane endpoints. <input type="checkbox"/> Discuss the justification, if any, for death as an end-point.
4. Experimental design and statistical analysis	<input type="checkbox"/> Consider pre-studies, statistical power and significance levels. <input type="checkbox"/> Define the experimental unit and decide upon animal numbers. <input type="checkbox"/> 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	<input type="checkbox"/> Arrange meetings with all relevant staff when early plans for the project exist. <input type="checkbox"/> Construct an approximate timescale for the project, indicating the need for assistance with preparation, animal care, procedures and waste disposal/decontamination. <input type="checkbox"/> Discuss and disclose all expected and potential costs. <input type="checkbox"/> Construct a detailed plan for division of labour and expenses at all stages of the study.
6. Facility location and design	<input type="checkbox"/> Conduct a physical inspection of the facilities, to evaluate building and equipment standards and needs. <input type="checkbox"/> Discuss staffing levels at times of extra risk.
7. Personnel training and risks	<input type="checkbox"/> Assess the current competence of staff members and the need for further education or training prior to the study. <input type="checkbox"/> Perform a risk assessment, in collaboration with the animal facility, for all persons and animals affected directly or indirectly by the study.
8. Waste disposal and decontamination	<input type="checkbox"/> Assess, and if necessary produce, specific guidance for all stages of the project. <input type="checkbox"/> 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	<input type="checkbox"/> Provide as much information as possible about test substances. <input type="checkbox"/> Consider the feasibility and validity of test procedures and the skills needed to perform them.
10. Experimental animals	<input type="checkbox"/> Decide upon the characteristics of the animals that are essential for the study and for reporting. <input type="checkbox"/> Avoid generation of surplus animals.
11. Quarantine and health monitoring	<input type="checkbox"/> Discuss the animals' likely health status, any needs for transport, quarantine and isolation, health monitoring and consequences for the personnel.
12. Housing and husbandry	<input type="checkbox"/> Attend to the animals' specific instincts and needs, in collaboration with expert staff. <input type="checkbox"/> Discuss acclimatization, optimal housing conditions and procedures, environmental factors and any experimental limitations on these (e.g. food deprivation, solitary housing).
13. Experimental procedures	<input type="checkbox"/> Develop refined procedures for capture, immobilisation, marking, and release or rehoming. <input type="checkbox"/> Develop refined procedures for substance administration, sampling, sedation and anaesthesia, surgery and other techniques.
14. Humane killing, release, reuse or rehoming	<input type="checkbox"/> Consult relevant legislation and guidelines well in advance of the study. <input type="checkbox"/> Define primary and emergency methods for humane killing. <input type="checkbox"/> Assess the competence of those who may have to perform these tasks.
15. Necropsy	<input type="checkbox"/> Construct a systematic plan for all stages of necropsy, including location, and identification of all animals and samples.

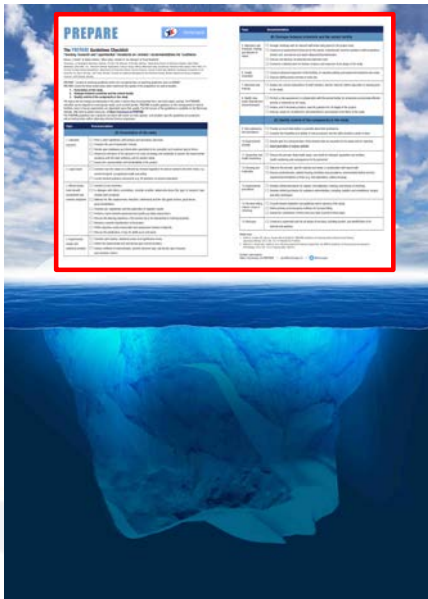
References
 1. Smith AJ, Clutton RE, Lilley E, Hansen KEA & Bratteid T. PREPARE Guidelines for Planning Animal Research and Testing. *Laboratory Animals*, 2017, DOI: 10.1177/0023677217724823.
 2. Kilkenny C, Browne WJ, Cuthill IC et al. Improving Bioscience Research Reporting: The ARRIVE Guidelines for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

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



In addition to the checklist, much more information is available on:

norecopa.no/PREPARE



Norecopa: PREPARE for better Science



COMPILATION OF SEVERITY CLASSIFICATIONS ACROSS EUROPE

I Interventions on body systems and functions	II Induction of diseases	III Pharmacology, other external causes	IV Housing, environment and behaviour	V Fetuses and premature animals	VI Clinical signs
Substance administration	Heart & circulation	Physical impacts	Housing & Nutrition	1. Feeding 2. Surgical interventions 3. Reproductive toxicology	1. Condition of fur, grooming, body orifices 2. Breathing, heart rate 3. Body temperature 4. Behaviour & body posture 5. Reaction to artificial stimulation; handling behaviour; reaction to physical contact 6. Food & water consumption 7. Prostration 8. Self trauma 9. Body weight
Specimen collection	Infectious diseases	1. Irradiation & chemotherapy 2. Exposure to electricity 3. Exposure to heat 4. Exposure to cold 5. Exposure to acids & basis 6. Traumatization 7. Pressure change 8. Sound & ultrasound 9. Magnetic fields 10. Chronic hypoxia	1. Housing in general 2. Gnotobiology 3. Use of metabolic cages 4. Deprivation – water 5. Deprivation – food 6. Exposure to overstimulation		
1. Collection of body fluids 2. Tissue sampling	1. Infections in general 2. Gnotobiology 3. Bacterial infections 4. Viral infections 5. Mycotic infections	Generation of pain	Breeding & Reproduction		
Surgical interventions	Neurology & sensory organs	Pharmacological studies	1. Identification method and tissue sampling for genotyping 2. Germ cells		
1. Anaesthesia 2. Surgical interventions in general 3. Abdominal and chest cavity 4. Musculoskeletal system 5. Implantation of mini-pumps, transponders 6. Organ transplantation 7. Implanted probes 8. Others	1. Convulsions 2. CNS lesions 3. Ischaemias 4. Visual system	1. Toxicity studies - general 2. Acute toxicity 3. Sub-acute toxicity 4. Chronic toxicity 5. Reproduction toxicology 6. Pharmacokinetic studies 7. Batch testing	GA animals		
	Endocrine, nutritional & metabolic diseases		1. GA animal model in the experiment 2. Phenotype characteristics 3. Generation of GA animals 4. Tissue sampling for genotyping		
	1. Endocrinology 2. Bone metabolism 3. Glucose metabolism 4. Body weight loss		Behaviour		
	Neoplasms		1. Aversive learning, conditioned avoidance behaviour and conflict tests 2. Deprivation – social 3. Deprivation – sleep 4. Deprivation – motion & mobility 5. Pharmacologically induced behavior		
	Immunology				
	1. Transplantation Cellular reactions Autoimmune reactions 4. Immunisation				

A. Zintzsch, J-B Prins & N Kostomitsopolous

norecopa.no/severity

A Refinement Wiki



[Main page](#)
[Recent changes](#)
[Random page](#)
[Help about MediaWiki](#)

Tools

[What links here](#)
[Related changes](#)
[Upload file](#)
[Special pages](#)
[Printable version](#)
[Permanent link](#)
[Page information](#)
[Cite this page](#)

AS191219 [Talk](#) [Preferences](#) [Watchlist](#) [Contributions](#) [Log out](#)

[Page](#) [Discussion](#) [Read](#) [Edit](#) [Edit source](#) [View history](#) [More](#)

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)^[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 training 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.

- [↑] ^{1.0} ^{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 [↗](#).
- [↑] ^{2.0} ^{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 [↗](#).
- [↑] 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 [↗](#).
- [↑] "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 [\(talk\)](#).

wiki.norecopa.no

Fish 21
Meetir

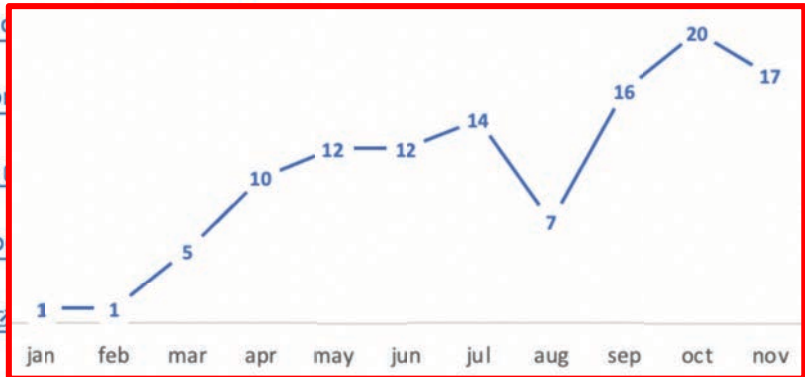
norecopa.no/meetings/meetings-calendar

norecopa.no/meetings/recorded-webinars

- > C (November 2020)
- > [How fish are treated under UK law](#) (Bowles, 5 November 2020)
- > [The salmon, the louse and the cleaner fish](#) (Lybæk, 5 November 2020)
- > [Better farming practices in aquaculture: can standards be improved](#) (2020)

Over 100 webinars within Lab Animal Science & Welfare in 2020

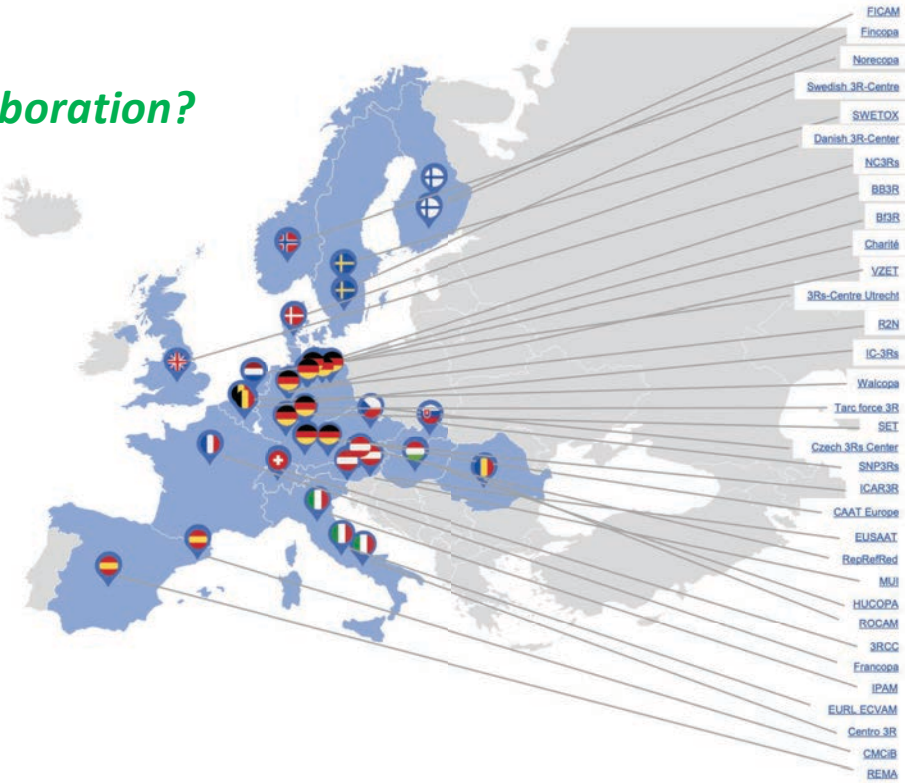
- > [The welfare of crabs, lobsters, and other crustaceans](#) (Broadhurst, 4 November 2020)
- > [Improving slaughter of fish, decapods and cephalopods in practice](#) (2020)
- > [Wild fish slaughter - capture, loading, storage and slaughter](#) (Bokma & Boonstra, 4 November 2020)
- > [The Use of an Automated Captive Bolt for Euthanasia of Laboratory Animals](#) (Weary, 4 November 2020)
- > [Humanely ending the life of animals - Laboratory, session 1](#) (November 2020)
- > [Humanely ending the life of animals - Laboratory, session 2](#) (November 2020)



European network of 3R Centres:

*Quo vadis?
Networking, competition or active collaboration?*

Society is unity in diversity
George Herbert Mead



Please note that some of these Centres, such as EURL ECVAM, serve more than the country in which they have been placed.
This overview has been compiled by Norecopa. Please report any errors or send suggestions for additions to post@norecopa.no
Designed by PresentationGo.com. Flags from flaticon.com

Interactive map:
norecopa.no/3REuropeOverview

Norecopa: PREPARE for better Science

Thanks to Norecopa's main sponsors:



- Standing Committee on Business Affairs, Norwegian Parliament
- Norwegian Ministries of Agriculture and Fisheries
- Research Council of Norway
- Laboratory Animals Ltd.
- Architect Finn Rahn's Legacy
- Nordic Society Against Painful Experiments (NSMSD)
- Norwegian Society for Animal Protection (Dyrebeskyttelsen Norge)
- Norwegian Animal Protection Alliance (Dyrevernalliansen)
- Novo Nordisk
- Sanofi
- Scottish Accreditation Board (SAB)
- Stiansen Foundation
- Universities Federation for Animal Welfare (UFAW)
- US Department of Agriculture (USDA)

norecopa.no/EPAA

Illustration photos: colourbox.com



SCOTTISH ACCREDITATION BOARD



Dyrebeskyttelsen Norge



Dyrevernalliansen

Norecopa: PREPARE for better Science