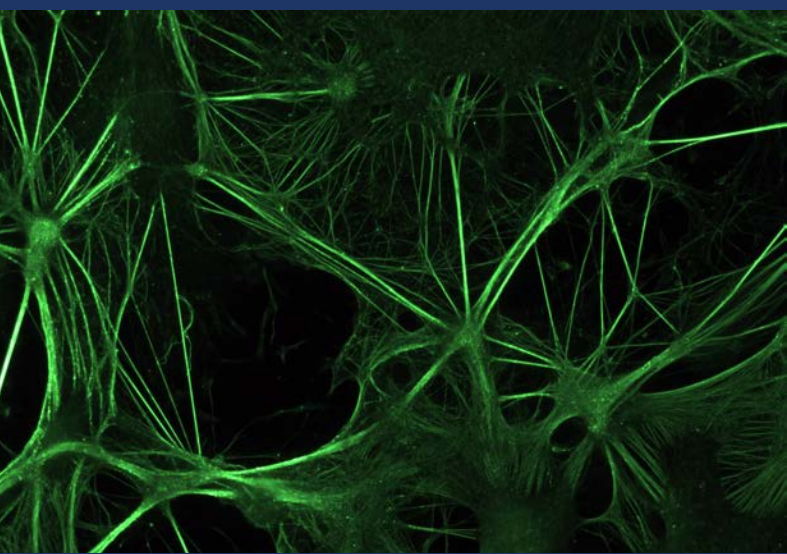




norecopa



NORECOPA

THE FIRST 10 YEARS

CONTENTS

4	Welcome to Norecopa
5	Thanks to our sponsors
6	About Norecopa
7	Three Rs and Three Ss
8	Norecopa's first 10 years in numbers
9	<i>ecopa</i> - a European umbrella organisation
9	Norecopa's 3R Prize
10	Norecopa's political history
11	Norecopa's presence worldwide
12	Norecopa's website: 6,000 pages of resources
13	Membership of Norecopa
13	Norecopa's Position Statements
14	Filling the Gap: PREPARE Guidelines for planning animal experiments
16	NORINA: an internationally respected database
18	Categories of severity in animal experiments
19	Collaboration with the Research Council of Norway
19	Translation of a Compendium in Laboratory Animal Science for Fish Researchers
20	Projects initiated by Norecopa in relation to fish research
23	Meetings arranged by Norecopa
24	The Voss meetings
25	Presentations at scientific meetings
25	A discussion forum for Norway's animal research facilities
25	Newsletters from Norecopa
26	The Culture of Care Network
27	Collaboration with the Norwegian Food Safety Authority
27	Collaboration with the Nordic 3R Centres
27	Collaboration with AWIC
28	Norecopa and social media
28	Outreach to scientists and schoolchildren
28	Awards
29	The next 10 years
30	Appendix 1: Presentations at Norecopa's annual meetings
30	Appendix 2: Presentations held at scientific meetings
32	Appendix 3: Newspaper chronicles
33	Appendix 4: Scientific publications
34	Acknowledgements



Bente Bergersen
Chair of Norecopa's Board (2007-2017)
Oslo, October 2017

WELCOME to Norecopa

In this booklet we provide details of the events leading up to [the foundation of Norecopa on 10 October 2007](#), and an overview of its activities in the first 10 years. We hope that this booklet will give you an impression of the scope of Norecopa's work, and also an idea of the tasks ahead of us.

The concept of National Consensus Platforms such as Norecopa was born in the turbulent times in Europe some 20 years ago when there was little meaningful communication between animal welfare/rights organisations and the scientific community. In many countries, scientists tended to avoid attempts at explanation of their activities, or dialogue with those opposed to animal research, due to the real risk of reprisals. Norecopa seeks dialogue with all stakeholders interested in animal research, aiming for consensus where possible in our attempts to advance the [3Rs of Russell & Burch](#) (Replacement, Reduction & Refinement). This should be seen as a win-win situation, since animals living in harmony with their surroundings will generate the most reliable data (Refinement), fewer animals will be needed to detect a treatment effect (Reduction) and the validation of alternative methods which are more relevant to human biology (Replacement) will proceed faster. This period has also witnessed an exponential increase in

the availability of realistic models for use in [education and training](#), enabling animals to be replaced or at the least supplemented. Several databases of information on all these aspects have been integrated into Norecopa's website during the last 10 years.

This booklet demonstrates that Norecopa has already achieved a lot with limited resources. When Norecopa was founded, it received core Governmental funding consisting of a 50% secretarial position and NOK 200,000 in running costs. In addition we have received additional funding from sponsors and other governmental bodies that has enabled us to perform the work described in this booklet. It also represents the hard and to a certain extent unpaid work by many more people, not least the Secretary, Board Members, Working Group Members, research collaborators and invited lecturers. Without a large number of Sponsors, a number of Norecopa's activities would not have taken place.

We extend our grateful thanks to all our colleagues in Norway and abroad who have supported us and worked with us on the projects described in this booklet. We would also like to thank the Administrative staff at the Norwegian Veterinary Institute for excellent assistance with the accounts and personnel matters.

THANKS

to our sponsors

A large number of sponsors have made it possible to finance several of Norecopa's activities, not least the construction of [Norecopa's website](#) and maintenance of [the NORINA database](#). These include:

- The Nordic Society against Painful Animal Experiments (NSMSD)
- The Research Council of Norway
- The Ministry of Fisheries and Coastal Affairs
- The Scottish Accreditation Board
- Novo Nordisk
- Laboratory Animals Ltd.
- The Animal Protection Fund (DyrevernfonDET) of the Norwegian Animal Protection Alliance (Dyrevernalliansen)
- The Norwegian Society for Protection of Animals (Dyrebeskyttelsen Norge)
- The Stiansen Foundation
- Universities Federation for Animal Welfare (UFAW)

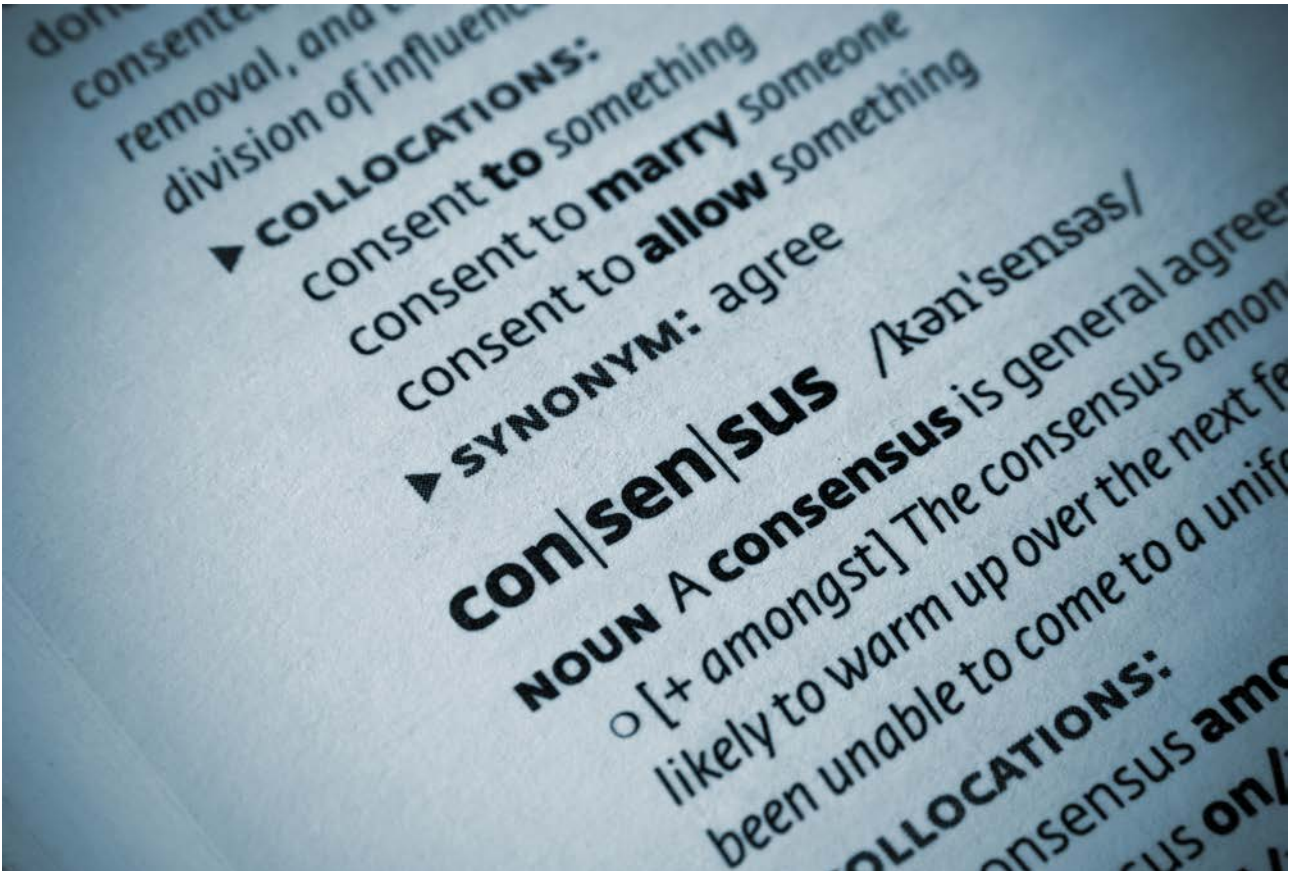
Norecopa has received substantial support from the Standing Parliamentary Committee on Business and Industry (Næringskomiteén), which has requested that the Government increase Norecopa's funding in the State Budget by NOK 500,000 each year from 2013.

Norecopa has also received substantial VAT remuneration from the Norwegian Gaming and Foundation Authority (Lotteri- og stiftelsestilsynet). Many institutions have also supported Norecopa's work indirectly by paying travel expenses for participants at our meetings.

A great many other sponsors supported the maintenance of the NORINA database before it was incorporated into Norecopa's website in 2016. These are mentioned on [Norecopa's sponsor page](#).



ABOUT Norecopa



Norecopa is an independent member organisation representing four major stakeholders in animal research:

- Government and regulatory authorities
- Research and teaching
- Industry
- Animal protection and welfare

The primary aim of Norecopa is to promote use of “the 3Rs” of Russell & Burch (*Replacement, Reduction, Refinement*). Norecopa’s role is therefore to contribute to increased knowledge within:

- Replacement of animal experiments by alternatives
- Reduction of the number of animals used in experiments
- Refinement of animal experiments to reduce suffering, increase animal welfare and increase the value of the experiments

Norecopa functions as a centre of competence on questions concerning the 3Rs and attempts to achieve its goals through consensus between the stakeholders by functioning as a National Consensus Platform.

Norecopa’s decision-making bodies are the **Board**, the **Annual General Meeting** and the **secretariat**. Norecopa’s Secretary is employed by the Norwegian Veterinary Institute, since Norecopa receives core funding from the Ministry of Agriculture and Food and Ministry of Trade, Industry and Fisheries via the Institute. Norecopa’s accounts are therefore audited by the State, in addition to Norecopa’s own auditor.

Norecopa is a member of *ecopa*, which supports national organisations working towards the 3Rs with the four stakeholders mentioned above in their governing body.

According to Norecopa’s **Statutes**, the Board must meet at least twice a year. The Board has, however, met three times a year from 2009, and its meeting on 13 October 2017 will be the 30th Board meeting so far. Bente Bergersen has been Chair of the Board since Norecopa’s inception. A total of 18 other people have filled the positions of Board Member or Deputy Board Member in the first 10 years.

Norecopa’s current Board is as follows:

Representatives of government and regulatory authorities (2014-2018)



Bente Bergersen,
Norwegian Food Safety Authority,
Chair of the Board



deputy: Johan Teige
Norwegian Food Safety Authority



Siri Knudsen
University of Tromsø



deputy: Aurora Brønstad
University of Bergen

Representatives of industry (2017-2020)



Børge N. Frødkriksen
PHARMAQ AS



deputy: Ann Cathrin Einen
MSD Animal Health Innovation

Representatives of animal protection and welfare (2014-2018)



Anton Krag
Norwegian Animal Protection Alliance



deputy: Harald Small
Norwegian Society for Protection of Animals



Karina Smith
(Senior Consultant, NORINA project)



Adrian Smith
(Secretary)

THREE Rs and THREE Ss

The **3R principle** proposed by **William Russell and Rex Burch** in the 1950s lies at the very heart of Norecopa's work, and forms the cornerstone of much of the world's laboratory animal legislation today:

- Replacement
- Reduction
- Refinement

Norecopa also endorses **the 3 Ss of Carol Newton**:

- Good Science
- Good Sense
- Good Sensibilities

This concept is not widely known, since Carol Newton herself, to the best of our knowledge, never published anything on the subject. For this reason, Norecopa took the initiative to write a paper describing the 3Ss, explaining how the concept became known and providing a personal interpretation of what we believe Carol Newton meant by it:

Smith AJ & Hawkins P (2016): **Good Science, Good Sense and Good Sensibilities: the Three Ss of Carol Newton**. *Animals*, 6(11): 70. doi: 10.3390/ani6110070



Professor Carol Newton (1925-2014).
Photo: National Library of Medicine, USA



William Russell & Rex Burch. Photo: FRAME, UK

Norecopa's first **10 YEARS IN NUMBERS**

A website with 6,000 webpages and 80,000 links

100 scientific presentations available for downloading

Publication of the PREPARE Guidelines checklist in 12 languages

4 international consensus meetings with a total of 180 participants

10 annual meetings and scientific seminars

Donations of NOK 140,000 to projects within the 3Rs

Awards totalling NOK 240,000 for Norecopa's 3R Prize, to 8 research groups

Attendance at over 20 scientific meetings

72 newsletters issued to over 1000 subscribers

47 research institutions are full members of Norecopa

11 scientific papers published

2 position statements

15 chronicles accepted by Norwegian newspapers

29 board meetings



norecopa

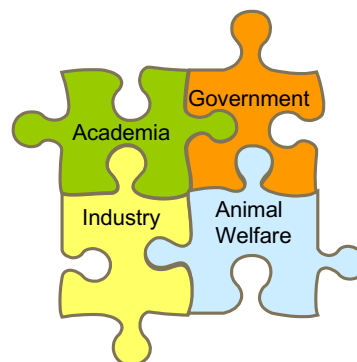
ecopa – a European umbrella organisation

Norecopa gets its name from its affiliation to *ecopa* (*European Consensus-Platform on Alternatives*). *ecopa* was founded to provide a forum where four stakeholders in animal research – Government, Academia, Industry and Animal Welfare – could meet to seek common ground and further the 3Rs.

ecopa recognises National Consensus Platforms which have representatives for all these stakeholders in their governing body. Norecopa's Board satisfies these criteria.

Representatives of Norecopa have been present at virtually all of *ecopa*'s Annual Meetings since it was established in 2000. Adrian Smith has been a Board Member of *ecopa*, and he is currently responsible for maintenance of *ecopa*'s website.

Norecopa has also regularly provided material for *ecopa*'s column in **the ALTEX journal**.



ecopa

Norecopa's **3R PRIZE**

According to **Norecopa's statutes**, the primary aim of Norecopa is to promote use of "the 3Rs" (*Replacement, Reduction, Refinement*) in Norway. Norecopa's Board decided early on that one way of promoting this would be to announce a Prize for work done in Norway to further the 3Rs.

The **statutes for the Prize** were approved by Norecopa's Board in February 2010. The purpose of the Prize is to increase awareness and use of the 3Rs in research and teaching. The Prize may be given for a variety of achievements including research, technological or practical innovations, and administrative efforts. Preference is given to work published during the previous two years in scientific journals with a referee system, but exceptions can be made.

Nominations for the Prize are sent to an independent Committee who inform the Board of their conclusions. It is up to the Board to decide whether or not to award the Prize.

The **3R Prize** was awarded for the first time at Norecopa's annual meeting in Oslo on 3 June 2010 and has been awarded annually ever since. The Prize consists of a Diploma and NOK 30,000.

The Prize has now been awarded 8 times, and a total of 25 people, in addition to the prizewinners, have been nominated.

The Prizewinners are:

- 2010: National Reference Laboratory for Algal Toxins, Norwegian School of Veterinary Science
- 2011: Knut-Erik Tollefsen, Norwegian Institute for Water Research
- 2012: Anne Berit Romstad, VESO Vikan
- 2013: Gøril Eide Flaten, University of Tromsø
- 2014: Ioanna and Axel Sandvig, NTNU
- 2015: Stig Larsen, Norwegian University of Life Sciences
- 2016: Øystein Flagstad, Norwegian Institute for Nature Research
- 2017: Adam Lillcrap, Norwegian Institute for Water Research



John Aasen Bunæs and Tore Aune collect Norecopa's 3R Prize on behalf of the National Reference Laboratory for Algal Toxins at the Norwegian School of Veterinary Science. This was the first time the Prize was awarded, in 2010.

Norecopa's POLITICAL HISTORY

In 2000 the Norwegian Ministry of Agriculture appointed a Working Group whose mandate was to evaluate the need for a National Consensus Platform for the 3Rs. The report from this Working Group, produced in 2001, recommended not only the establishment of a National Platform, but also the creation of a State Fund earmarked for research and development work within alternatives to animal experiments.

A Government White Paper on Animal Welfare and Husbandry (*Stortingsproposisjon nr. 12 (2002-2003)*) recommended that such a Platform should be established. The Standing Committee on Business and Industry (*Næringskomitéen*) who presented the Paper to Parliament, requested that this be followed up with a Research & Development Fund 'like the Swedish model'. Such a Fund has not been created.

A temporary National Platform was run by the Norwegian School of Veterinary Science for two years, in 2005-2006, with funds from the Norwegian Food Safety Authority (Mattilsynet).

A permanent National Platform, which was given the name Norecopa to indicate its affiliation to *ecopa*, was established on 10 October 2007. Core funding was provided by the Ministries of Agriculture and Fisheries, to cover a 50% secretarial position and to provide NOK 200,000 for running costs.

At Norecopa's inaugural meeting in 2007, the Ministry emphasised that Norecopa was expected to be 'an important source of information for the future use of animals in research in Norway' (our translation). It soon became apparent to Norecopa, however, that with the limited resources it would be difficult to initiate a number of the activities necessary to promote the 3Rs, since most of the funds would be needed for the day to day running of the National Platform. Norecopa therefore began to seek political support for increased funding, primarily via the annual open hearings organised by the Standing Committee for Business and Industry (*Næringskomitéen*) on the Government's proposals for the State Budgets. Since 2013, this contact with the Standing Committee has resulted in an extra annual sum of NOK 500,000. Norecopa is extremely grateful for this funding, which has enabled

Norecopa both to increase the Secretary's working hours and to finance a number of projects related to the 3Rs.



Adrian Smith presents Norecopa's case to the Standing Committee on Business and Industry at a budget hearing (image from the Parliamentary TV channel)

In an attempt to strengthen the core functions of Norecopa and advance the 3Rs, Norecopa, in collaboration with Norwegian and foreign experts, sent a comprehensive application for funding over 10 years to the Research Council of Norway in 2016, in connection with their call entitled **INFRASTRUKTUR**. The primary objective was 'to build a robust and long-term knowledge bank for those planning, conducting and evaluating research which involves the use of animals, providing information on resources to implement the 3Rs: Replacement, Reduction and Refinement'. The secondary objectives were

- to create a Wiki for sharing information on methods of refining animal experiments
- to increase the availability of global 3R resources by connecting to the USDA's literature database

This application was unsuccessful, but the Expert Panel gave the application an overall score of 5 (Very Good), and a Feasibility Score of 6 (Excellent).

Norecopa's

PRESENCE WORLDWIDE

Norecopa or its representatives have held presentations in the following locations during the first 10 years



Baltimore • Beijing • Bergen • Brno • Brussels • Copenhagen • Edinburgh • Gardermoen • Hannover • Hell • Ispra • Liege • Kristiansand • Milan
• Montreal • New Haw • Oslo • Prague • Rome • Seattle • Stockholm • Tallinn • Tromsø • Varese • Vico Equense • Weymouth • Zagreb • Zurich

Norecopa's website:

6,000 PAGES OF RESOURCES

In keeping with Norecopa's statutes, which mandate Norecopa to aid dissemination of knowledge about 3R resources, considerable time and money has been invested in building a website for the organisation.

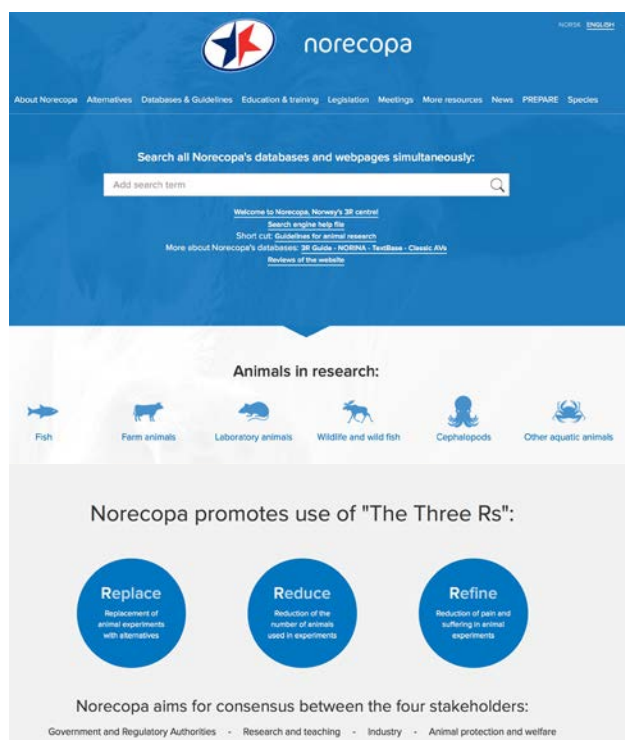
National and international contacts have long indicated at scientific meetings that there is an urgent need for comprehensive, up-to-date, curated and searchable websites of 3R resources. Norecopa has therefore had as one of its aims to build a "one-stop-shop" for international 3R resources, and to promote this website worldwide. This task has been made easier by the extensive networks which the Secretariat and Board Members already had within the laboratory animal science and animal welfare communities.

By 2015 it was evident that some of this technology was becoming outdated. We set aside part of the annual Governmental funding

two consecutive years, but this was far from sufficient. For this reason, funds were collected from a variety of sources to design and build a brand new, state-of-the-art website incorporating an intelligent search engine. This website, <https://norecopa.no>, was launched on 31 May 2016. Great efforts were taken to ensure that the majority of the addresses of older webpages, which many people might have bookmarked, were automatically redirected to the corresponding page on the new website. The new website also fully incorporates other databases which Norecopa manages, such as [NORINA](#) and [Textbase](#).

The design, construction and fine-tuning of this new website has cost over NOK 700,000. Norecopa is extremely grateful to all who have made this investment possible, both sponsors and Government.

Norecopa's new website has now been in operation for 15 months. During this period, the website has had over 53,000 unique visits and a total of over 170,000 page views. At present, the site is averaging approximately 1,100 visits and 3,000 page views per week, but these numbers are increasing. These figures include visits by Norecopa's own staff, but many of these visits are in connection with queries about website content.



Senior Software Developer Øyvind Wærenskjold, Bitfarm, at work on the back end of the Norecopa website.

If you think it's expensive to hire a professional to do the job, wait until you hire an amateur.

Red Adair

The Norecopa website contains over 22,000 unique links to other webpages, in total over 80,000 links. Any website of this size will develop dead links, not least as external sites change their addresses or close down. Norecopa has therefore installed a Broken Link Checker to facilitate monitoring of the dead links on the website. At present, less than 3.5% of these links are dead. The majority of these are in parts of the website which are rarely accessed, such as media articles mentioned in old newsletters. Every webpage contains links so that users can report dead links to the Secretariat.

Norecopa is very grateful to the three IT companies which have developed and maintained the various websites since 2005: Nettforsk, Netlab and Bitfarm. The Veterinary School and Norecopa are indebted to Richard Fosse, previously of the University of Bergen, and the late Rees Griffiths of Macquarie University, Sydney, who provided invaluable support when the NORINA database was established and then provided on the Internet in the late 1990s.



The "incident room" for Norecopa's new website: ideas on a wall at Netlab, Kristiansand

MEMBERSHIP OF NORECOPA

According to the statutes, both organisations and individuals can be **members of Norecopa**. The majority of Norway's research institutions are members. Norecopa has relatively few individual members.

NORECOPA'S POSITION STATEMENTS

As part of its mandate to disseminate information on the 3Rs, Norecopa has published position statements and guidelines on a variety of procedures, written either by Norecopa's Secretary and Board Members, or by others.

Norecopa's Board and Secretary have published **position statements** on:

- Toe clipping in mice
 - Food deprivation in rodents
- and an **Advisory Note on pain relief of rodents for collection of tissue for genotyping**.

The Norecopa website has also been used to publish **student essays** from courses in Laboratory Animal Science on:

- Biometric methods of identification
- Fin clipping in fish
- Guides to identification methods for birds

Filling the Gap:

PREPARE GUIDELINES FOR PLANNING ANIMAL EXPERIMENTS

The science community has recently expressed increasing concern about the validity, reproducibility and translatability of animal experiments, despite the existence of guidelines for reporting these experiments in journals. Clearly, something else was missing.

Our experience is that there are many factors, rarely reported in scientific papers, which can dramatically influence the outcome of experiments on animals, affect the animals' welfare, and compromise the health and safety of all concerned.

Based upon over 25 years' experience in managing animal facilities and advising scientists on how to plan experiments, Norecopa's Secretary, together with Norwegian colleagues and experts from the UK, compiled a set of guidelines in 2016-17 for planning experiments which may involve the use of animals. These guidelines were given the name **PREPARE (Planning Research and Experimental Procedures on Animals: Recommendations for Excellence)**. PREPARE covers all stages of quality assurance, from the management of an animal facility to the individual procedures which make up an experiment. The guidelines contain the elements necessary to adapt them to field experiments.

PREPARE was launched at the **World Congress on Alternatives and Animal Use in the Life Sciences** in Seattle in August 2017. A paper on PREPARE had been pre-published in the European journal *Laboratory Animals* two few weeks previously. Thanks to support from the **Universities Federation for Animal Welfare (UFAW)** in the UK, this paper could be published under Open Access, so that it is freely available without a journal subscription.

PREPARE before you ARRIVE:
Guidelines for Planning Animal Research and Testing

Adrian J. Smith¹, R. Eddie Clutton², Elliot Lilley³, Kristine E.Aa. Hansen⁴ & Trond Bratteli⁵

¹Norecopa, 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 9RE, U.K.; ⁴Section of Experimental Biomedicine, Department of Production Animal Clinical Science, Faculty of Veterinary Medicine, Norwegian University of Life Sciences, P.O. Box 8146 Oslo, 0503 Oslo, Norway; ⁵Division for Research Management and External Funding, Western Norway University of Applied Sciences, 5020 Bergen, Norway.

As part of ongoing efforts to **reduce waste and increase the reproducibility** of animal research and testing, we have produced a set of guidelines for planning animal experiments:

PREPARE (Planning Research and Experimental Procedures on Animals: Recommendations for Excellence)
norecopa.no/PREPARE

The PREPARE guidelines for **planning** animal studies complement the ARRIVE guidelines and other similar guidance for **reporting**.

A large number of factors, rarely reported in scientific papers, can dramatically influence the **validity and outcome** of animal studies, as well as the health and safety of all those concerned. The PREPARE guidelines cover these and address all stages of quality assurance, from the animal facility or preparation to the individual procedures which make up the study.

A manuscript describing the PREPARE guidelines is available free of charge under Open Access in *Laboratory Animals*, 2017. DOI: 10.1177/00236771774823 and via norecopa.no/PREPARE

A two-page **PREPARE checklist** in 12 languages can be downloaded free of charge from: norecopa.no/PREPARE/prepare-checklist

The PREPARE website also includes suggestions for a contract between scientists and animal facilities, to help division of labour, costs and responsibilities.

The PREPARE guidelines cover 15 topics, grouped in three main sections:

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 disposal and decontamination
9. Quality control of the components in the study
10. Test substances and procedures
11. Experimental animals
12. Quarantine and health monitoring
13. Housing and husbandry
14. Experimental procedures
15. Humane killing, release, rescue or rehoming
16. Necropsy

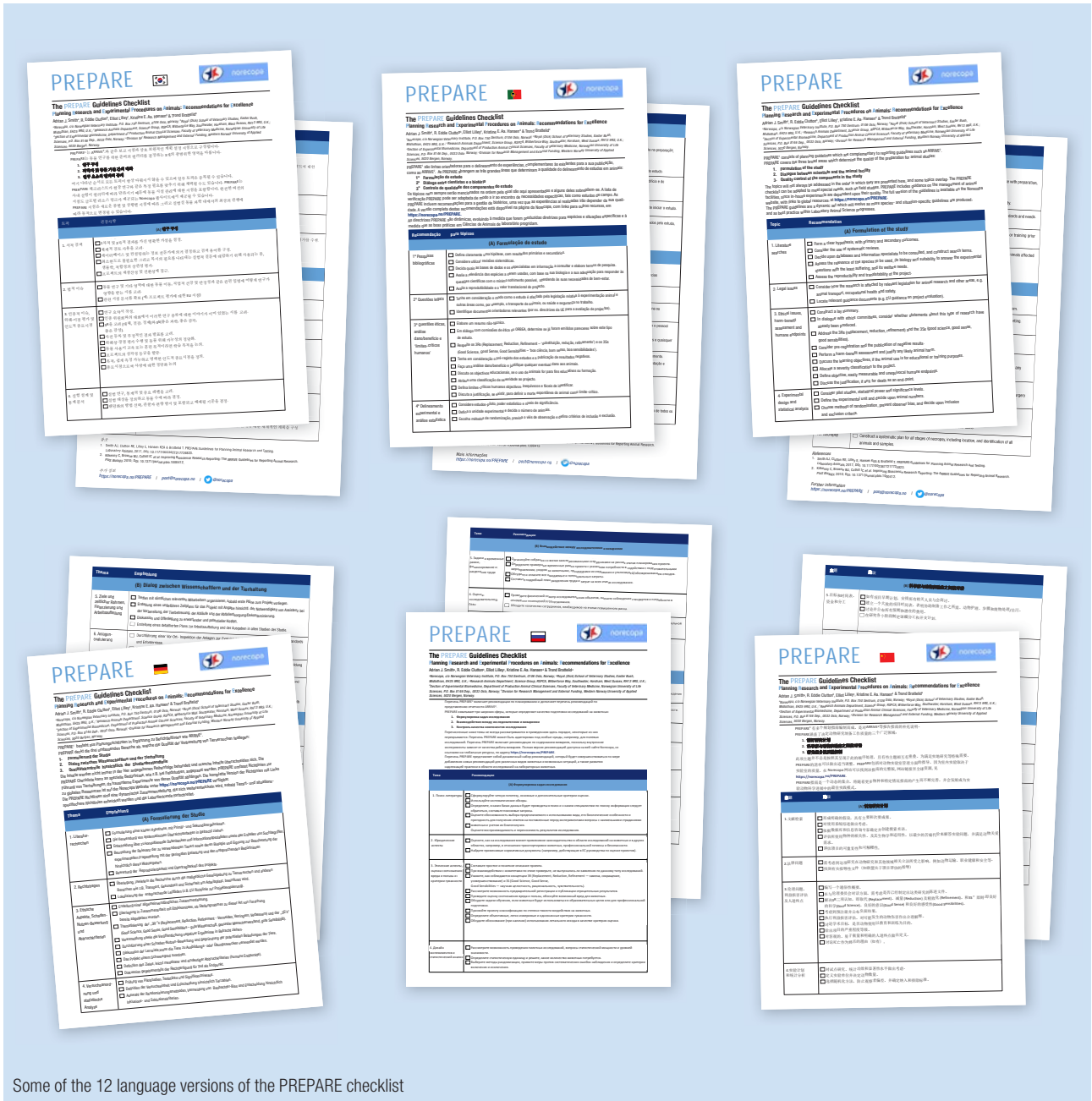
PREPARE contains numerous links to guidelines and other international resources, and uses the intelligent search engine of the Norecopa website (norecopa.no):

More information: adrian.smith@norecopa.no

The PREPARE guidelines are not a static checklist:
The PREPARE website contains a dynamic set of recommendations which will evolve as more species- and situation-specific guidelines are produced, and as best practice within Laboratory Animal Science progresses.

Open Access publication of the PREPARE guideline was sponsored by the Universities Federation for Animal Welfare (UFAW). Norecopa gratefully acknowledges additional financial support from the Norwegian Ministry of Agriculture and Food, Dag Ståsen's Foundation, Laboratory Animals Ltd, the World Society Against Painful Animal Experiments, Novo Nordisk and the Scottish Accreditation Board. Graphic: colourboom.com

A handout used to promote PREPARE at the World Congress in Seattle, August 2017



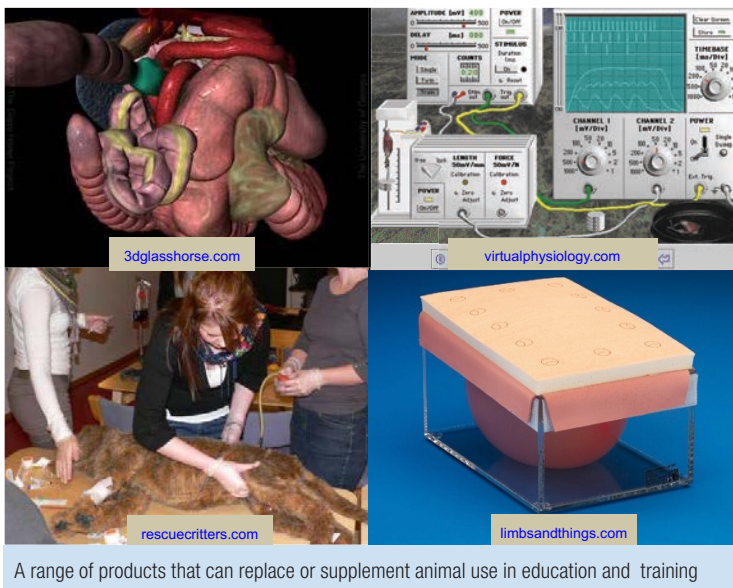
Some of the 12 language versions of the PREPARE checklist

PREPARE contains a 2-page checklist summarising the principles in the guidelines, which are divided into 15 topics. We hope that many scientists will find this checklist useful. It is currently available in 12 languages, and more are in the pipeline.

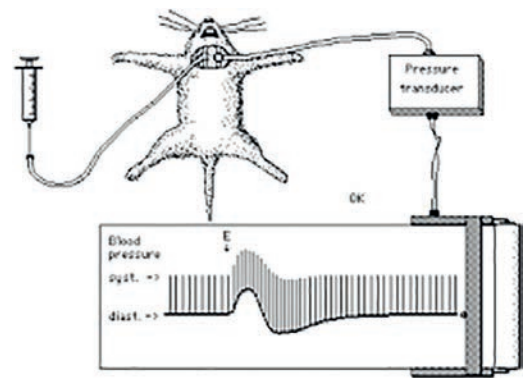
However, PREPARE contains many additional resources which reporting guidelines lack: each topic on the checklist has its own webpage on Norecopa's website, and on these there are links to more specific guidelines and other global resources. In this way, PREPARE utilises the collective resources of the 6,000 page Norecopa website.

PREPARE also includes suggestions for a contract between scientists and animal facilities, as an aid to the division of labour, costs and responsibilities between them. Failure to be able to publish a scientific paper, simply because essential data were not collected due to misunderstandings, is a waste of both animal lives and human resources. Attention to the details in PREPARE will lessen the risk of manuscript rejection, improve animal welfare and human safety, and advance the 3Rs. More information is available on the PREPARE website: <https://norecopa.no/PREPARE>.

NORINA: an internationally respected database



A range of products that can replace or supplement animal use in education and training



One of the earliest computer simulations, that started the work of compiling the NORINA database: PharmaTutor, developed by Daniel Keller at ETH Zurich in 1986-7.

Norecopa's new website integrates several databases which were originally constructed as separate entities. This integration work was one of the reasons for the high cost of producing the new website. Integration makes it considerably easier for users to search seamlessly for 3R resources, without having to know which database to search in, or their web addresses.

The oldest and best-known of these databases, two of which were developed at the Laboratory Animal Unit of the Norwegian School of Veterinary Science, is **NORINA** (*A Norwegian Inventory of Alternatives*). NORINA is a database

of computer programs, 3D models, simulators, and other audiovisual aids that can be used as alternatives or supplements to animal use in teaching and training at all levels, from schools (where dissections are still commonplace in many countries) to University. NORINA began in 1991 as a 6-month project financed by the Research Council of Norway, to collect information on the computer simulations which were beginning to emerge, as affordable personal computers became popular. It quickly became clear, however, that this initial project should be continued, as more and more products entered the market. Thanks to **support from a wide variety of sources in Norway and abroad**, the

NORINA database is still being maintained, 26 years later, by the same person, **Karina Smith**. A history of the NORINA database is **available on Norecopa's website**.

A few years later, another database, **TextBase**, was also started, to publish information on textbooks and other literature within Laboratory Animal Science, alternatives and related fields.

More recently, some of the products in NORINA using older technological platforms (such as laser discs, microslides and films) were moved into a separate database called **Classic AVs**.

THE 3R GUIDE DATABASE

A fourth database has also been constructed, based upon a collaboration with the **Animal Welfare Information Center (AWIC)** at the US Department of Agriculture's National Agricultural Library in Maryland. This database, called **3R Guide**, was based upon work performed by Dr. Tim Allen of AWIC and Adrian Smith, originally published in 2005 in the journal **Animal Welfare**, but subsequently greatly expanded.

3R Guide contains curated information collected worldwide on databases, guidelines, information centres, email lists, journals and other 3R resources which are of use when planning or conducting animal experiments.

All these four databases have been seamlessly integrated into Norecopa's new website, along with plain text pages, and are continually updated. Users do not any longer have to be aware of these databases, as a comprehensive set of filters enables them to expand or narrow their searches instantaneously, as they wish.



Tim Allen of AWIC distributing information about the 3R Guide database at the Pan-American Conference on Alternatives in Baltimore in April 2016.



Many sets of films and slide series demonstrating techniques for handling, injecting and bleeding laboratory animals were made at the Veterinary School and incorporated into the Norecopa website



IKEA rats perform well to teach veterinary students the elementary principles of handling and injecting animals

CATEGORIES OF SEVERITY IN ANIMAL EXPERIMENTS

EU Directive 2010/63 on the Protection of Animals Used for Scientific Purposes, which came into force on 1 January 2013 (on 1 August 2016 in Norway), introduced a concept which was new to many scientists: that all procedures have to be classified according to their severity.

In July 2009, an Expert Group commissioned by the EU met to produce guidelines for the

severity classification of such procedures. This report focuses, however, on procedures that are used on the traditional laboratory animal species. There are a number of procedures commonly used in fish research that are not mentioned in the report, and fish are likely to react differently to some of the procedures which are mentioned.

At Norecopa's international consensus meeting on Harmonisation of the Care and Use of Fish in Research in September 2009, the participants concluded that a working group should be appointed to produce a complementary report that focuses on procedures used in fish research. Norecopa convened a group under the leadership of Dr. Penny Hawkins, and it delivered its report in December 2010. This has been published in Laboratory Animals and is available for free download thanks to sponsorship from Laboratory Animals Ltd.:

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).

More information on severity classification is available on Norecopa's website, including a poster describing the severity classification of procedures involving fish which was presented at the 8th World Congress on Animal Use and Alternatives in the Life Sciences in Montreal in 2011.

Guidance on the severity classification of procedures involving fish

P Hawkins¹, K Ryder², N Dennison², G Goodman², S Hetherington⁴, S Llywelyn-Jones⁵ and AJ Smith⁶

¹Research Animals Department, RSPCA, Wetherby, West Sussex, RH13 9RS, UK; ²Animals (Scientific Procedures) Inspectorate, Home Office, P.O. Box 6779, Dundee, DD1 9WV, UK; ³Biological Services, The University of Edinburgh, Chancellor Building, 49, Little France Crescent, Edinburgh, EH16 4SB, UK; ⁴CEPAS, Pakefield Road, Lowestoft, NR33 0HT, UK; ⁵King's College London, Biological Services Unit, 4th floor, Hodgkin Building, Guy's Campus, London, SE11 1UL, UK; ⁶Norecopa, c/o Norwegian Veterinary Institute, P.O. Box 750 Sentrum, N-0106 Oslo, Norway

Severity classification is an important tool in both implementing and monitoring the progress of refinement, including reporting the actual severity of procedures which is now part of the legislation on animal research and testing in some countries. Predictions 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.

The recently revised EU Directive 2010/63 requires signatories to ensure that the severity of all procedures is classified as 'non-recovery' (under terminal anaesthesia), 'mild', 'moderate' or 'severe', using assignment criteria set out by the European Commission (EC) – see diagram. 'Subthreshold' procedures are those that are expected to inflict less pain, suffering or distress than that caused by the introduction of a needle.

An EC Working Group produced a report in 2008 giving examples of procedures within these categories, but these are most relevant to research using terrestrial species.

A working group set up by the Norwegian Consensus-Platform for the 3Rs (Norecopa) has published a complementary document that gives guidance on severity classification in fish research, including examples of 'subthreshold', 'mild', 'moderate', 'severe' and 'upper threshold' procedures. This document will make it easier for fish researchers to implement the requirements of the new Directive, which must be transposed into national law in January 2013.

How would you categorise these procedures?

Examples from each category in Norecopa's guidelines (simplified):

Subthreshold	Mild	Moderate	Severe	Upper threshold
<ul style="list-style-type: none"> Behavioural studies Feeding studies where food restriction does not cause any harm Marking using non-toxic and non-averse dyes in the water Manipulations of photoperiod, temperature or water gases that do not cause significant harm 	<ul style="list-style-type: none"> Gentle research where humane endpoints are applied at the first clinical sign of disease or earlier Gentle, brief handling of fish out of water Blood sampling under anaesthesia using recommended volumes and techniques Removal of a small part of one fin, where rapid healing and minimal dysfunction or pain are expected Toxicological studies where animals are humanely killed at or before the onset of clinical signs 	<ul style="list-style-type: none"> Cannulation of blood vessels followed by successive blood sampling within recommended limits Intraperitoneal injection of substances known to cause adhesions Intramuscular or intraperitoneal implantation of telemetry devices by surgical procedures (under general anaesthesia) External attachment of telemetry devices with a risk of interference with normal activity and behaviour 'Shaking' in a net out of water to produce a stress response Removal of scales to promote fungal growth 	<ul style="list-style-type: none"> Salwater/freshwater challenge for scientific purposes where it cannot be predicted that the fish will adapt without severe effects or mortality Disease studies likely to cause death where the study cannot be controlled to avoid mortality Vaccine potency testing with persistent impairment of the animal's condition, progressive disease leading to the animal's death, or associated with long-lasting moderate pain, distress or suffering Surgical interventions under general anaesthesia which are expected to result in severe or persistent moderate postoperative pain, suffering or distress 	<ul style="list-style-type: none"> Pathophysiological studies where animals will experience substantial pain, suffering or distress which is long lasting Description of survival curves or similar tests where death is an endpoint and where death is preceded by prolonged and substantial pain, suffering or distress

Norecopa has set up a website with links to these guidelines and more information on severity classification:

www.norecopa.no/categories

Correspondence to: Adrian Smith, Norecopa, c/o Norwegian Veterinary Institute, P.O. Box 750 Sentrum, N-0106 Oslo, Norway (adrian.smith@veinst.no)

Collaboration with the **RESEARCH COUNCIL OF NORWAY**

Norecopa has enjoyed close collaboration with the Research Council of Norway. In connection with the Council's budget for 2008, the Ministry of Agriculture and Food wrote (*our translation*):

Fundamental questions relating to animal husbandry and welfare are central research tasks, and knowledge about alternatives to the use of research animals is important for the Ministry to reach its goal of reducing the number of animals that are used in research.

In collaboration with the Ministry of Fisheries and Coastal Affairs, the Council asked Norecopa to examine the need for research within the welfare of fish used in research. In the Spring of 2009 a working group of 8 members was appointed to conduct this task. The group produced a report (103 pages, in Norwegian) entitled: **Fisk i forskning - miljøkrav og velferdsindikatorer hos fisk** (Fish in research - environmental requirements and welfare indicators in fish), which was published by the Council in December 2009.



The Report covers the following areas:

- Environmental needs and design of experiments
- Welfare indicators
- Pain, stress, painful procedures and humane endpoints in fish research
- Pain relief in fish
- Vaccine development and fish welfare
- Implementation of the 3Rs in fish research
- Conclusions and recommendations
- Projected costs
- Other available reports related to fish research

The Report still forms a valuable basis for future work on the welfare of fish in research.

Norecopa's Secretary and Board Member Siri Knudsen met the Board of the Council's Marine Programme in January 2014. This meeting also confirmed earlier impressions that whereas Norecopa could apply to the Council for project support, the costs of maintaining the Secretariat must be met by others. For this reason, Norecopa has invested considerable time in political activity to indicate the need for these resources.

The Research Council has also supported international scientific meetings organised by Norecopa: **Harmonisation of the Care and Use of Agricultural Animals in Research** at Gardermoen in 2012 and **Systematic Reviews and Harm-Benefit Assessment** at Voss in 2015.

TRANSLATION OF A COMPENDIUM IN LABORATORY ANIMAL SCIENCE FOR FISH RESEARCHERS

Norecopa financed the translation into English of a Norwegian-language **Compendium in Laboratory Animal Science for Fish Researchers** produced by the Norwegian School of Veterinary Science in 1999. The Compendium was translated, and parts of it updated, in 2010-2011.





PROJECTS INITIATED BY NORECOPA IN RELATION TO FISH RESEARCH

Norecopa has initiated several projects related to the use of fish in research, since this group of species represents the vast majority of research animals (based on numbers) in Norway.

1. 3R-KART (Kartlegging av kunnskap om implementering av de 3 R'ene i fiskeforsøk)

A report issued by the temporary Consensus Platform before Norecopa was founded (*Analyse av forsøksfisk benyttet i Norge i 2003: Antall, arter og formål*), indicated that there was a great potential for improving the way in which fish experiments were reported. The report also disclosed weaknesses in the way in which potentially painful experiments were reported. Norecopa concluded that there was a need to produce more specific guidelines for reporting the severity categories of fish experiments, and a need to identify areas on a national basis where implementation of the 3Rs could be improved. Such work was expected to improve not only animal welfare but also the scientific quality of projects performed on fish.

Norecopa applied for external funds to supplement its own resources for this project. It received NOK 100,000 from the Animal Protection Fund (Dyrevernfondet) managed by the Norwegian Animal Protection Alliance (Dyrevernalliansen) in 2010, and NOK

100,000 from the Ministry of Fisheries and Coastal Affairs in 2011. The 3R-KART project began in 2011.

Norecopa was also concerned about the competence of personnel at Norway's animal research facilities, particularly those using fish. In February and March 2009, Norecopa conducted an **anonymous survey** among the responsible persons at Norway's animal facilities to map the perceived level of competence among their personnel, of whom 63% replied. Of those who replied, 44% stated that not all their technicians satisfied the current qualification requirements, while 37% reported that they were qualified. 19% of the responsible persons did not know whether their technicians were qualified, and 5% had no knowledge of these requirements.

Part 1 of 3R-KART consisted of a questionnaire which was sent to 37 fish research facilities in October 2011 and was filled out

by the responsible person at each facility. The questionnaire was designed by a lawyer, evaluated by a researcher specialising in questionnaires and finally approved by Norecopa's Board. The answers from these questionnaires were analysed by one of Norecopa's Board Members, veterinarian Dag Marcus Eide.

Part 2 consisted of in-depth interviews and site visits from December 2011 to February 2012, conducted by veterinarian Toril Malmstrøm on behalf of Norecopa. The visits focused on the following factors:

- how many animals, of which species, were in use, and for what
- how terms such as 'simple sampling methods' and 'painful' were interpreted
- the criteria for using humane endpoints and when fish were humanely killed
- the facility's knowledge of the species' environmental needs and methods of husbandry
- the extent to which the 3Rs were already implemented
- routines for health monitoring and methods to avoid the influence of health status on research results

The final report from the 3R-KART project was issued in August 2012. The main conclusions from the project were:

- there was a potential to discuss and improve the use of environmental enrichment in fish experiments

- Norway had made good progress in the development of alternatives to the use of live fish in vaccine development and testing, and further work should be encouraged
- there was a need to improve the content of courses in laboratory animal science, to harmonise practice
- a database for publishing raw data and results of fish experiments would improve our knowledge and reduce the number of fish used in research, but it would require considerable resources

As a result of 3R-KART, Norecopa decided to focus on the first two of these conclusions in future projects.



The final report from the 3R-KART project

2. ENRICH Fish

As described above, Norecopa wished to focus on environmental enrichment of research fish. Norecopa allocated NOK 100,000 to this work in 2013 and invited fish research institutions to send in applications for this money, which was to be used to allow experienced researchers to write comprehensive applications to the Research Council of Norway for longer-term projects in this area. Three strong candidates were received, from Bergen, Trondheim and Tromsø. Norecopa chose to support an application from Nofima Tromsø and their collaborators in Bergen.

Nofima's application to the Research Council received an excellent evaluation and funds were awarded by the Council for a two-year project, which started in March 2015. The project was called **ENRICH Fish (Using optimised environmental enrichment to improve the rearing conditions and welfare of Atlantic salmon in relation to the three Rs)**. The aim of ENRICH Fish was to improve

the rearing conditions and welfare of Atlantic salmon used in laboratory experiments.

The project consisted of three parts:

- Evaluation and development of methods for physical enrichment, including the use of shelter, substrates in the tank and alteration of environmental factors such as water level, current speed and light intensity
- Efforts to provide social enrichment by optimising group size and investigating the effect of changing rearing unit volume on acclimation and behaviour
- Construction of a multi-stakeholder platform for synergy, recommendations and dissemination of results.

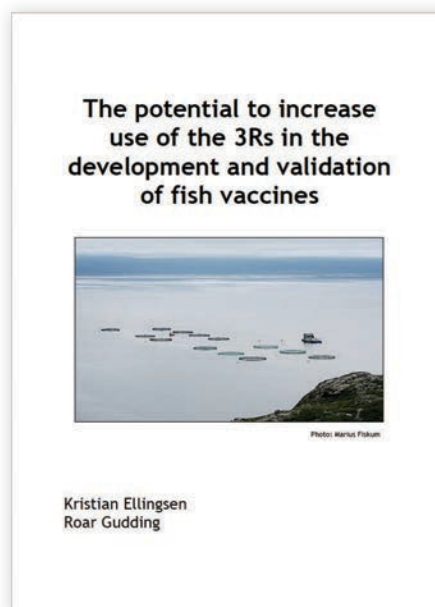
Parts 1 and 2 of the project were a collaboration between Nofima Tromsø and the Institute of Marine Research in Bergen. Norecopa was responsible for part 3 of the project.

Public stakeholder meetings were held in Oslo, Bergen and Trondheim to present the project and its findings. The scientific data from the project are still being prepared for publication, but full details will be posted on a dedicated website which Norecopa maintains for this purpose: <http://www.enrich-fish.net>.

Although ENRICH-Fish is designed to improve the rearing conditions and welfare of Atlantic salmon used in applied laboratory experiments, it is expected that the results will also be highly relevant to the containment and welfare of fish in other situations, whether it be in the laboratory or in commercial settings.

3. Development and validation of fish vaccines

Norecopa is concerned about the use of live fish to develop and test new fish vaccines. In 2010, Norecopa had discussions with experts at the Norwegian Veterinary Institute on the use of live animals to develop and test fish vaccines. As a result of this, Norecopa commissioned a report, with support from the Animal Protection Fund (Dyrevernfondet) of the Norwegian Animal Protection Alliance (Dyrevernalliansen) on the need for vaccines in the light of the current health situation in Norwegian fish farms, and an evaluation of the present-day requirements for vaccine testing, including the potential to use alternatives. The report was written by Roar Gudding and Kristian Ellingsen at the Norwegian Veterinary Institute and published in 2011. This report, entitled **The potential to increase the use of the 3Rs in the development and validation of fish vaccines**, formed the basis for Norecopa's work in this area in the years ahead.



4. Replacement of live fish in vaccine tests

In 2014 Norecopa allocated NOK 40,000 to start a project on the replacement of live fish with measurements of serum antibodies. This money was given to a collaboration between the contract

research organisation VESO Vikan and the vaccine producer Pharmaq, following on from work they had performed previously to replace animal use in the testing of Furunculosis vaccines.

5. Dialogue between the suppliers of fish vaccines

In March 2016 Norecopa invited Norway's vaccine suppliers, an expert on the European Pharmacopeia's requirements for fish vaccines and a statistician to a closed meeting with the aim of exchanging ideas on ways to further advance the implementation of the 3Rs in this area. All the vaccine companies operating in

Norway were represented at the meeting. The participants expressed their satisfaction at the opportunity for a frank round-table discussion about the challenges of vaccine development and testing. A memorandum was circulated after the meeting.

MEETINGS arranged by Norecopa



Norecopa has arranged many scientific meetings, as part of its mandate to seek consensus and disseminate information about advances within the 3Rs. Wherever possible, Norecopa asks presenters to provide a copy of their presentation, so that these can be made readily available on Norecopa's website. Approximately 100 presentations have so far been made available. These include the presentations from Norecopa's **international consensus meetings** on the care and use of specific groups of research animals. Four consensus meetings have been arranged, including one in 2005 which was organised by the temporary platform before Norecopa was established, and the fifth one will be held in October 2017. Each meeting also produces a consensus document, summarising the participant's views on the state of implementation of the 3Rs, the challenges ahead, and topics on which more work should be done. Norecopa has used these documents to plan its future work:

Harmonisation of the Care and Use of Fish in Research (May 2005). Harmonisation of the Care and Use of Animals in Field Research (May 2008). Harmonisation of the Care and Use of Fish in Research (September 2009). Harmonisation of the Care and Use of Agricultural Animals in Research (September 2012)

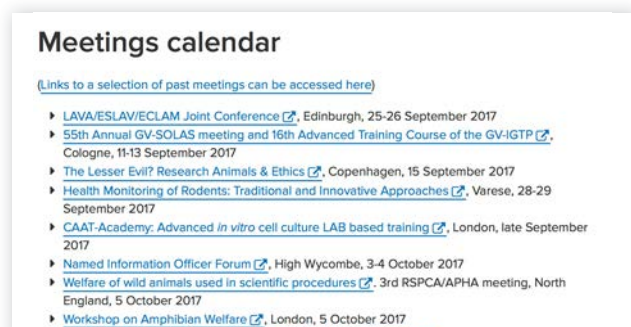
The next meeting in this series is:

Harmonisation of the Care and Use of Wild and Domestic Mammals and Birds in Field Research (October 2017)

In addition to these consensus meetings, Norecopa arranges a scientific seminar in connection with the **Annual General Meeting**,

which according to the **statutes** is held before 15 June each year. The lectures have been presented by national and international experts and have covered a wide variety of relevant topics and are all available on Norecopa's website (see Appendix 1).

Norecopa maintains an up-to-date **Meetings Calendar** within Laboratory Animal Science and Alternatives. This calendar is referred to in **Norecopa's newsletters** which are published in English approximately 8 times a year.



Delegates at the fourth consensus meeting in September 2012.

The VOSS MEETINGS

Norecopa, in collaboration with other partners, has arranged two scientific meetings at the historic Fleischer's Hotel in Voss in Western Norway.

The first of these was a Workshop in collaboration with the University of Bergen on **Systematic Reviews and Harm-Benefit Assessment**, in May 2015. The Workshop was aimed at researchers who were planning animal experiments, members of National Committees and animal welfare bodies, and regulators. The meeting attracted 37 participants from 7 countries.

The second meeting was in February 2016 and took the form of a **FRAME Training School in Experimental Design and Statistics**. The UK organisation FRAME organises these Schools annually, usually in Europe. This was the first time that the School had come to Norway. The School was over-subscribed, and was attended by 50 participants from 10 countries. The School was sponsored by the Norwegian Society for Protection of Animals (Dyrebeskyttelsen Norge) and Laboratory Animals Ltd. Four travel bursaries were financed by *ecopa*.



PRESENTATIONS

at scientific meetings

Representatives of Norecopa have attended a great many scientific meetings during the last 10 years, usually with a presentation about the work of Norecopa. These are described in more detail in Norecopa's **Annual Reports** and are listed in Appendix 2.



Adrian Smith presents Norecopa's 3R Guide database at the 9th World Congress on Alternatives and Animal Use in Prague in 2014.

A DISCUSSION FORUM FOR NORWAY'S ANIMAL RESEARCH FACILITIES

There is at present no official discussion forum in Norway for those who work at animal research facilities. Many other countries have such forums, which provide a very useful means of exchanging knowledge and advancing the 3Rs. Norecopa has compiled a list of some of these on its website.

Norecopa's Secretary started an unofficial forum in the 1990s while he was employed at the Norwegian School of Veterinary Science. When he became Secretary of Norecopa in 2007, he continued this work and Norecopa now pays the administrative costs of this forum. Currently, there are representatives of over 40 animal facilities on the list. The exact number of facilities in Norway is not easily available, but the subscribers to the forum cover the vast majority of the Norwegian institutions that have animal facilities.

NEWSLETTERS from Norecopa

One of Norecopa's major tasks is to disseminate information about the 3Rs. Norecopa began to publish electronic **newsletters** in 2008. Three were issued the first year, but since then 7-9 newsletters have been published each year. The newsletters have been issued in English since no. 3/2017, since there have been an increasing number of English-speaking subscribers who presumably have used Google Translate to read them. The number of subscribers has risen as a result, and at present is approximately 1,200 from 17 countries.

The newsletters contain a lot of valuable information on the 3Rs, not all of which has been incorporated into Norecopa's webpages. To make sure that this information is still easily available after the newsletters have been issued, they have all been **converted into webpages** and the contents are indexed by the website search engine. Many of the links to older, popular articles in the media will die out with time, but the newsletters still represent a valuable resource.

At present, there are subscribers from the following countries in addition to Norway: Austria, Belgium, Denmark, Finland, France, Germany, Italy, Poland, Portugal, South Africa, Spain, Sweden, Switzerland, The Netherlands, UK and USA.

THE CULTURE OF CARE NETWORK

The term *Culture of Care* is used in the laboratory animal community to indicate a commitment to improving animal welfare, scientific quality, care of the staff and transparency for the stakeholders. It is embedded in the legislation of the European Union and the guidance documents produced by the EU Commission.

At the FELASA Congress in Brussels in June 2016, there were 7 presentations which discussed the culture of care. At the Congress it was proposed to establish a network of persons actively working with the culture of care. Norecopa offered to host the webpages for the Network.

Interest from the participants has so far resulted in a network of over 30 members from 15 countries. The goal of this Network is to

- promote a mind-set and behaviour that continuously and proactively works to progress and promote laboratory animal welfare and the 3Rs
- go to a level above and beyond a culture of compliance
- include a culture of challenge

The primary outcome of the Network is to share and publish examples of activities fostering a Culture of Care which make a difference in terms of improved animal welfare.

The International Culture of Care Network

Thomas Bertelsen, Novo Nordisk A/S, Denmark; **Nikolaos Kostomitsopoulos**, Biomedical Research Foundation Academy of Athens, Greece; **Anja Petrie**, University of Aberdeen, UK; **Adrian Smith**, Norecopa, Norway

Background

Recital 31 of the Directive 2010/63/EU states that breeders, suppliers and users of research animals should have an animal-welfare body which fosters a **climate of care** and provides tools for implementation of the 3Rs. Many user establishments use the phrase 'Culture of Care' on their websites, but no clear definition of this exists.

The aims of the Culture of Care Network

To provide a forum for the quick and efficient dissemination of ideas and efforts to create a culture of care

To promote a mindset and behaviour that continuously and proactively works to advance laboratory animal welfare and the 3Rs

To aim for more than a culture of compliance

To encourage a culture of challenge, rather than accepting established practice

The experience gained by the network will be useful for the review of Directive 2010/63/EU, which is due by November 2017.

Our members

The network consists of people with a large range of backgrounds:

- Laboratory animal scientists & technicians
- Laboratory animal veterinarians
- Members of Animal Welfare Bodies & National Committees
- Representatives of National competent authorities
- Communications experts
- Members of animal welfare organisations

This diversity of competency and perspectives ensures that the network encourages a culture of care both for the animals used in research and those working with them.

We are currently 28 members in 14 countries.

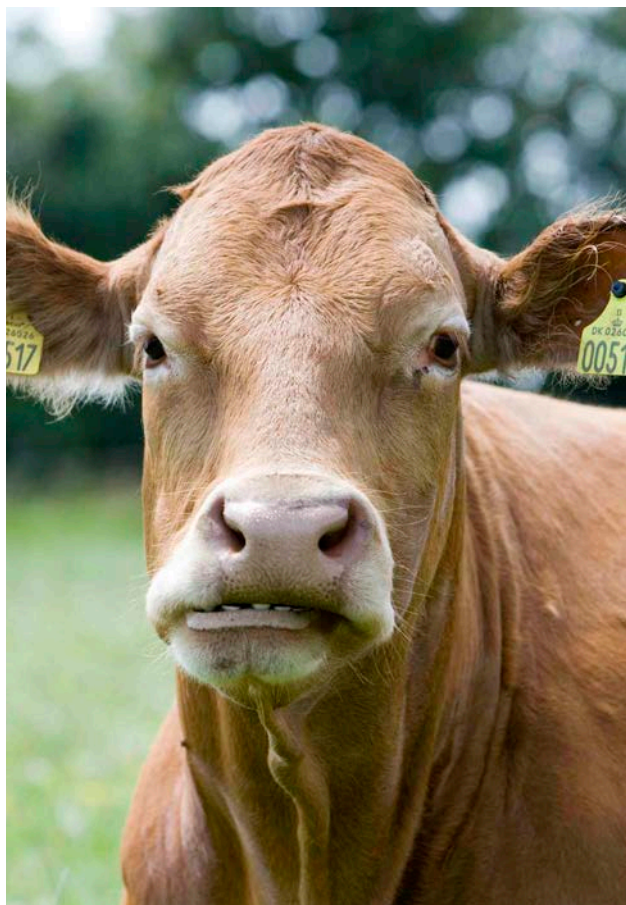
Interested in joining?
 Members are expected to work actively with Culture of Care.
 Please contact Thomas Bertelsen (tsbt@novonordisk.com)

References:

- M H Lloyd, B W Foden, S E Wolfensohn. Refinement: promoting the three Rs in practice. *Laboratory Animals* 2008; 42:284-293
- J Klein, K A Bayne: Establishing a Culture of Care;. *ILAR Journal* 2007; 48(1):3-11
- H Herzog: Ethical Aspects of Relationships Between Humans and Research Animals. *ILAR Journal* 2002; 43(1):27-32
- <https://norecopa.no/alternatives/culture-of-care>
- http://ec.europa.eu/environment/chemicals/lab_animals/pubs_guidance_en.htm

Poster about Culture of Care at the Scand-LAS symposium, Copenhagen, 30 May - 2 June 2017

Collaboration with the **NORWEGIAN FOOD SAFETY AUTHORITY**



Norecopa strives for close collaboration with the Norwegian Food Safety Authority (Mattilsynet), which is the regulatory body for animal research in Norway. Norecopa has written detailed responses when the Authority has sent new animal research legislation out on a hearing. So far this has entailed:

- the new Animal Welfare Act. Norecopa delivered **an opinion about the proposal in February 2008**. Norecopa was mentioned several times in the **Proposition** about the Act. Norecopa also presented its views during the **Standing Committee for Business and Industry's open hearing** on the revised version of the Act in January 2009.
- the new Regulation on the use of animals in research. Norecopa wrote a **detailed commentary** to this proposal in December 2012.

Collaboration with the **NORDIC 3R CENTRES**

Norecopa seeks also close collaboration with colleagues in the other Nordic countries. Denmark established **a 3R centre** in 2013. Norecopa's Secretary, Adrian Smith, applied to become a Board Member on a private basis, and was chosen for that task. The Board was elected for 4 years. A new Board will be elected in October 2017, when Adrian Smith hopes for re-election. Membership of the Board has been valuable for fostering mutual recognition and inspiring activities of both the Norwegian and Danish centres.

Sweden has announced that it will open **a 3R Centre** in November 2017. Norecopa welcomes this new Centre and will attend the opening event.

Finland's 3R centre **FICAM** focuses on alternative methods within toxicology, which has not been an area of priority for Norecopa so far. However, Norecopa's Secretary has had regular contact with representatives of FICAM via meetings organised by *ecopa*.

Danish 3R-Center
RRR

Collaboration with **AWIC**

Norecopa has had a long-standing informal collaboration with the US Department of Agriculture's Animal Welfare Information Center (AWIC) at the National Agricultural Library (NAL) in Maryland. This resulted in, among other things, the development of **the 3R Guide database**, which, is now part of the Norecopa website, see p.17.

Norecopa and SOCIAL MEDIA

While Norecopa does not have the capacity to offer much time to social media, we recognise the influence which these now have. Norecopa has its own **Twitter account** and **Facebook profile**.

These are not used very actively by Norecopa, for reasons of capacity. Norecopa has around 590 “Likes” on Facebook and 100 followers on Twitter. These communication channels are mainly used to advertise Norecopa’s newsletters and website resources, but Twitter in particular is useful for monitoring activity by colleagues abroad.



OUTREACH to scientists and schoolchildren

As Secretary of Norecopa and since leaving the Veterinary School in 2011, Adrian Smith has lectured each year on courses in Laboratory Animal Science for Researchers at the Universities of Bergen and Tromsø, on the subject of Alternatives and the 3Rs. He is currently co-author of chapters in two new textbooks, one on fish welfare and the other on how to plan animal experiments.

He has taken an initiative to update the links in Guidelines issued by the **Association for the Study of Animal Behaviour** and the **Animal Behavior Society** (ASAB/ASB) for the treatment of animals in behavioural research and teaching. He has held lectures on animal experimentation and alternatives for two High School classes in Kristiansand in January 2017.

He has also written an article entitled *Forsøksdyr* about animal research which is available from the electronic library of the Norwegian National Research Ethics Committees (*Forskningsetisk Bibliotek til de nasjonale forskningsetiske komitéene*), which was updated in 2015.

AWARDS



Norecopa was awarded the **Stiansen Prize** in 2014 for, among **other things**, the NORINA database. This prize is awarded annually by the **Stiansen Foundation** and consists of NOK 50,000 and a sculpture by **Elena Engelsen**.

Norecopa’s Secretary, Adrian Smith, received the **Sir Patrick Moore Award** from the Royal Society for the Prevention of Cruelty to Animals at a ceremony in London in June 2017, for his ‘work to reduce laboratory animal suffering’.

THE NEXT 10 YEARS

Attempting to predict the future is recognised to be a dangerous business. We can, however, summarise Norecopa's ambitions for the next 10 years, and hope that those in a position to do so will help us reach these goals:

- Norecopa's primary need is for more resources to the Secretariat, and to spread the burden of work on more shoulders.
- We hope that the resources we have gathered on the website will be utilised by increasingly more people worldwide. We have invested considerable money in this site, and we are proud that it is one of the most comprehensive of its kind. As with any database, it will need maintenance and regular updating to retain its relevance.
- In particular, we hope that the PREPARE guidelines and the webpages associated with these will prove to be as useful to the world's scientists as reporting guidelines have become. PREPARE is a practical resource which builds upon experience gained in managing animal facilities and advising scientists on how to implement the 3Rs.
- While we hope that Norecopa's name will be even better known worldwide, we have not forgotten that the Consensus Platform is first and foremost a national resource. We hope that Norecopa can contribute actively to harmonisation of practice in Norway, to the further development of best practice, and to the establishment of a stronger network for the many small animal facilities and animal welfare bodies in this long and thinly populated country.

At the inauguration meeting of Norecopa on 10 October 2007, State Secretary Ola Heggem, said in his address that it was a priority in both Ministries (Agriculture and Fisheries) to follow up Norecopa. We hope that Norecopa will be given the support it needs to continue to serve the animal research community for many years to come.

APPENDIX I Presentations at Norecopa's annual scientific meetings.

Norecopa arranges a scientific seminar in connection with the Annual General Meeting. The following lectures are available on Norecopa's website:

The PREPARE guidelines for planning animal research and testing (Adrian Smith, Norecopa)

Assessing welfare: how, why and when? (Elliot Lilley, RSPCA, UK)

How to assess welfare in genetically altered animals? (Anne Zintzsch, MDC, Berlin)

A brief history of the fish embryo toxicity (FET) test (Adam Lillicrap)

Putting tags and transmitters in birds:

are our guidelines flights of fantasy? (Rory Wilson, Swansea University)

How to construct a proper literature search when planning an experiment (Alice Tillema, Nijmegen)

Detection and alleviation of pain in fish (Lynne Sneddon, University of Liverpool)

Pain management after surgery: are we good enough? (Eddie Clutton, University of Edinburgh)

Humans on a microchip: how far have we come? (Reyk Horland, TissUse, Berlin)

Fish and fish robots: how can they help to understand each other? (Maarja Kruusmaa, Tallinn University of Technology)

Technology and 3Rs in wildlife research:

state of the art (John Linnell, NINA)

Which animals feel pain? (Janicke Nordgreen, Norwegian University of Life Sciences)

Can we be sure the animal is anaesthetised? (Eddie Clutton, University of Edinburgh)

Are our methods of killing animals humane? (Huw Golledge, UFAW)

Animal testing in toxicology: does it work? (Thomas Hartung, CAAT/Europe)

Opportunities for replacing animals in toxicity testing (Thomas Hartung, CAAT/Europe)

Advice on how to run a Centre for the 3Rs (Mark Prescott, NC3Rs, UK)

APPENDIX 2

Presentations at scientific meetings

This list is just a selection and includes neither attendance at ecopa's General Assemblies nor meetings where Norecopa's work was presented by colleagues outside Norway:

2009:

The Norwegian Animal Research

Authority's course for inspectors, Bergen

The Norwegian Animal Research

Authority's course for responsible persons at animal facilities, Gardermoen

2010:

Toxicity Testing in the 21st Century and Alternative Methods, Milan

2012:

Scand-LAS symposium, Hell

BCLAS-ESLAV-ECLAM symposium, Liege



3R Research Foundation-SGV
symposium, Zurich
Conference on EU Directive 2010/63, Varese

2013:

Welfare of Agricultural Animals in
Research: Cattle, Goats, Pigs and Sheep,
New Haw
Scand-LAS symposium, Tallinn

2014:

The Norwegian Animal Research
Authority's meeting on marking of deer
and predators, Oslo
Scand-LAS symposium, Stockholm
9th World Congress on Alternatives and
Animal Use in the Life Sciences, Prague
EU Commission seminar, Zagreb

2015:

Seminar on Fish Health, Oslo
British-Chinese seminar, Beijing
The Norwegian Food Safety Authority's
meetings about Norway's new legislation,
Trondheim
AAALAC-ESLAV-ECLAM seminar, Hannover
EUSAAT congress, Linz
Course in Cephalopod Biology and
Handling, Vico Equense, Naples

2016:

Addressing the needs for refinement of
laboratory fish, Cefas-NC3Rs seminar,
Weymouth
Meeting of the European 3R centres, Ispra
Animal Models for Human Diseases: Best
practices for in vivo research, Brno
FELASA congress, Brussels
Focus on Severe Suffering, Brussels
EUSAAT Congress, Linz
Meeting organised by the Netherlands
National Committee, Brussels

2017:

Seminars about the ENRICH Fish project,
Bergen & Tromsø
10th World Congress on Alternatives and
Animal Use in the Life Sciences, Seattle



Norecopa's Secretary held two presentations at a British-Chinese seminar in Beijing in March 2015

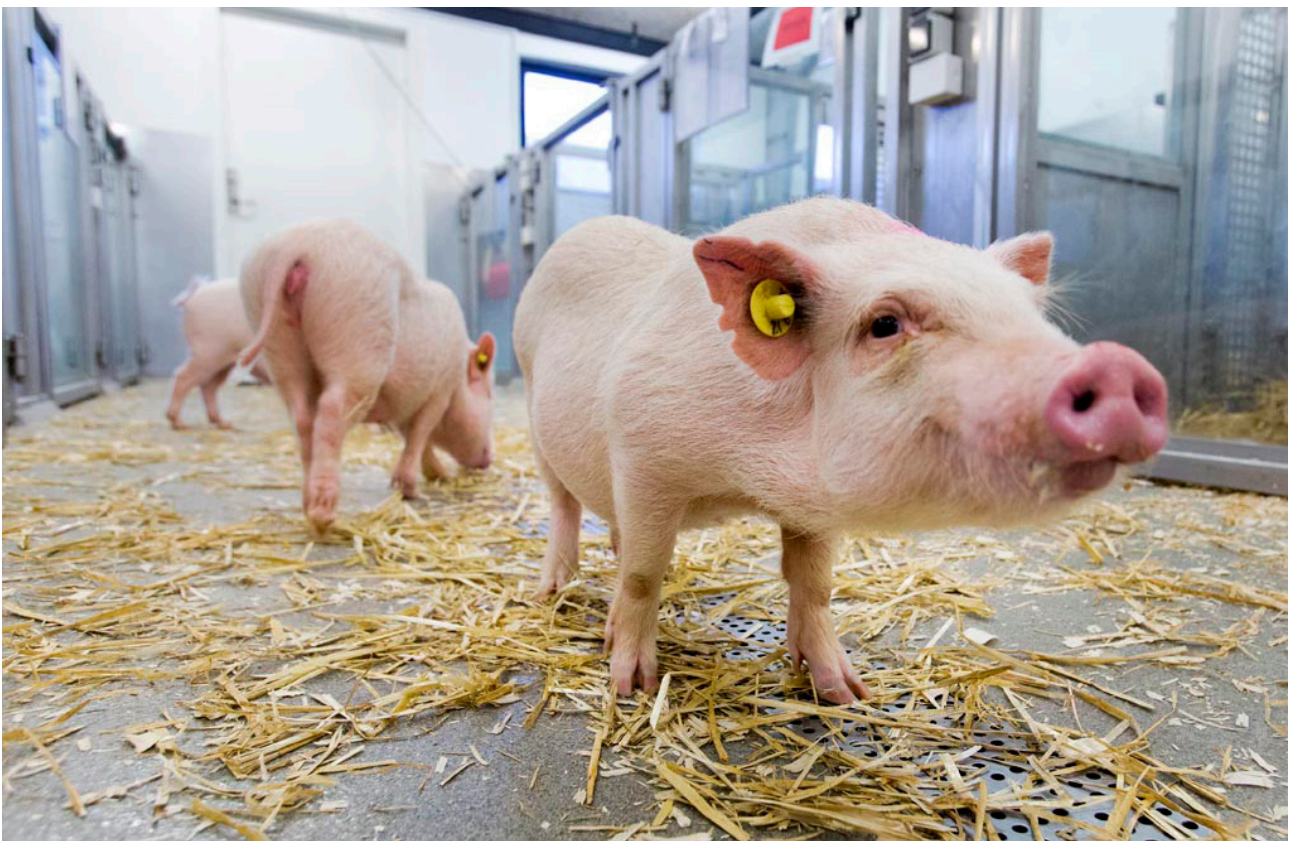


Veterinarian and colleague Anne Zintzsch took a poster of the PREPARE guidelines to the GV-SOLAS meeting in Cologne in September 2017, and the organisers placed handouts in all the conference bags.

APPENDIX 3 Chronicles by Norecopa

The following chronicles written by Norecopa's representatives have been accepted by Norwegian newspapers:

1. Renate Johansen & Adrian Smith: **Sammen om dyreforsøk.** Dagbladet, 30 November 2007
2. Bente Bergersen & Adrian Smith: **Politisk interesse for alternativer til dyreforsøk?** Rana Blad, 4 May 2008
3. Bente Bergersen & Adrian Smith: **Halvhjertet forsøkssatsing.** Nationen, 20 October 2008
4. Bente Bergersen & Adrian Smith: **Regjeringens satsing på alternativer til dyreforsøk.** Nationen, 20 November 2008
5. Bente Bergersen & Adrian Smith: **Ny lov om dyreforsøk.** Nationen, 27 May 2009
6. Bente Bergersen & Adrian Smith: **Byr vi oss om dyreforsøk?** Adresseavisen, 25 June 2010
7. Bente Bergersen & Adrian Smith: **Dyrevelferd på sparebluss.** Aftenposten, 28 June 2010
8. Bente Bergersen & Adrian Smith: **Forbedringer i fiskeforsøk?** Nationen, 4 December 2010
9. Adrian Smith: **Alternativer til dyreforsøk.** Nationen, 5 December 2011
10. Adrian Smith: **Alternativer til dyreforsøk.** Dagsavisen, 16 December 2011
11. Bente Bergersen & Adrian Smith: **Nye tider for forsøksdyrene?** Nationen, 19 January 2013. Also published in Forskning.no, Kragerø Blad (17 January 2013, with a comment from Miljøpartiet De Grønne on 25 January 2013), Rogalands Avis (21 January 2013) and Harstad Tidende (30 January 2013)
12. Bente Bergersen & Adrian Smith: **Blåblå politikk for forsøksdyr?** Nationen, 21 October 2013
13. Bente Bergersen & Adrian Smith: **Hvem er det som snakker om fisken?** Nordlys, 7 December 2013
14. Bente Bergersen, Siri Knudsen, Anton Krag, Anne Ramstad & Adrian Smith: **En norsk forsøksdyrvisjon.** Nationen, 10 December 2014
15. Adrian Smith: **Dyreforsøk: ut av skyttergravene!** Aftenposten, 2 October 2015



APPENDIX 4 A list of Norecopa's scientific publications

Norecopa's staff (**in bold type**) have published the following papers in scientific journals (in chronological order).

1. Grimholt U, Johansen R & **Smith AJ** (2009): **A review of the need and possible uses for genetically standardized Atlantic salmon (*Salmo salar*) in research.** *Laboratory Animals*, 43. 121-126.
2. **Smith AJ & Bergersen B** (2010): **Konsensus om dyreforsøk - Norecopas rolle.** *Norsk veterinærtidsskrift*, 122:313-317.
3. Hawkins P, Dennison N, Goodman G, Hetherington S, Llywelyn-Jones S, Ryder K & **Smith AJ** (2011): **Guidance on the severity classification of procedures involving fish: Report of a Working Group appointed by the Norwegian Consensus-Platform for the Replacement, Reduction and Refinement of animal experiments (Norecopa).** *Laboratory Animals*, 45, 219-224.
4. Dewi S, Aune T, Aasen JAaB & **Smith AJ & Larsen S** (2014): **The development of Response Surface Pathway Design to reduce animal numbers in toxicity studies.** *BMC Pharmacology and Toxicology*, 15:18.
5. Hansen K, **Smith K & Smith A** (2014): **Alternativer og supplementer til bruken av dyr i undervisningen ved Norges veterinærhøgskole.** *Norsk veterinærtidsskrift*, 126:13-16.
6. Hawkins P, Clutton E, Dennison N, Guesgen M, Leach M, Sharpe F, Simmons H, **Smith A**, Webster J & Weyer U (2014): **Report of an RSPCA/AHVLA meeting on the welfare of agricultural animals in research: cattle, goats, pigs and sheep.** *Animal Technology and Welfare*, 13: 43-56.
7. **Smith AJ** (2015): **How can standardised reporting of animal research advance the 3Rs?** *Acta Laboratorium Animalis Scientia Sinica*, 2015, 23(5): 543-550
8. **Smith AJ** (2015): **Have the 3Rs and alternatives been effectively explored?** *Acta Laboratorium Animalis Scientia Sinica*, 2015, 23(6): 656-664
9. **Smith AJ & Hawkins P** (2016): **Good Science, Good Sense and Good Sensibilities: the Three Ss of Carol Newton.** *Animals*, 6(11): 70. doi: 10.3390/ani6110070
10. Reed B, Beatham S, Carter S, Clubb R, Garrod K, Gale M, Gomm M, Knight K, Lane J, Mathews F, Pimlott P, **Smith A**, Wilson R, Weyer U & Hawkins P (2017): **Report of a RSPCA/ APHA meeting on the welfare of wild animals used in research.** *Animal Technology and Welfare*, 16(1), 13-25.
11. **Smith AJ**, Clutton RE, Lilley E, Hansen KEAa & Brattelid T. (2017) **PREPARE: Guidelines for planning animal research and testing.** *Laboratory Animals*, DOI: 10.1177/0023677217724823



ACKNOWLEDGEMENTS

At the risk of ignoring the Norwegian expression “no one mentioned, no one forgotten” we wish to thank in particular the following for their support during the development of a National Consensus Platform and the activities of Norecopa (in approximately historical order with their affiliation at that time):

Richard Fosse, University of Bergen

Tim Morris, GlaxoSmithKline

Professor Bert van Zutphen, Utrecht University

Rees Griffiths, Macquarie University, Sydney

Baard Johannessen, Nettforsk

Renate Johansen, Trond Brattelid, Kristine Hansen and colleagues at the Norwegian School of Veterinary Science

Olav Lyngset and colleagues, Norwegian Ministry of Agriculture

Espen Engh and colleagues, Norwegian Food Safety Authority

Gunvor Knudsen and colleagues at the Research Animals Unit, Norwegian Food Safety Authority

The competent persons at Norway's animal research facilities

Former Director Harald Gjein, Norwegian Veterinary Institute

Past and present Board Members of *ecopa*

Past and present Board Members of Norecopa

Past and present members of Norecopa's Election Committee

Past and present members of Norecopa's 3R Prize Committee

Institutional and individual members of Norecopa

Penny Hawkins and colleagues, RSPCA, UK

The Norwegian Animal Protection Alliance

Knut Carlberg, Nordic Society against Painful Animal Experiments

The Norwegian Society for Protection of Animals

Susanna Louhimies, EU Commission

David Anderson

Jan L. Ottesen and colleagues, Novo Nordisk

Tom Bengtson and colleagues, secretariat of Denmark's

3R-Center and National Committee

The Board Members of Denmark's 3R-Center

Tim Allen, Kristina Adams and colleagues, Animal Welfare

Information Center, Maryland, USA

Siri Anzjøn, Kjell Emil Naas, Kristin Danielsen and colleagues, Research Council of Norway

Ingvill Løken, Norwegian Medicines Agency

Laboratory Animals Ltd.

Jon Richmond and colleagues, Scottish Accreditation Board

The Stiansen Foundation

The Universities Federation for Animal Welfare (UFAW), UK

Past and present members of the Standing Parliamentary

Committee on Business and Industry

Øyvind Wærenskjold, Bitfarm

Kjell Ingvar Torvik and colleagues, NetLab AS

Chris Noble and collaborators on the ENRICH Fish project at Nofima and the Institute of Marine Research

and a multitude of friends and colleagues worldwide in the field of Laboratory Animal Science, animal welfare and 3R alternatives.

Responsible Editor: **Adrian Smith**, Norecopa

Illustrations from Norecopa or colourbox.com if not otherwise credited.

Front cover photos (clockwise from top left):

Novo Nordisk; Jon Terje Hellgren Hansen; Terje Aamodt, Nofima;

Vibeke D. Valderhaug, Sandvig Laboratory, NTNU

Bente Bergersen (pp. 4 & 7): Kjerstin + Steinar

<http://fotografenekjerstinogsteinar.no>

Pigs (p. 32): Novo Nordisk

Goats (p. 33): Birte Graeber Bredahl, Norwegian Veterinary Institute

Rabbits (p. 35): Novo Nordisk

Salmon (p. 35): Terje Aamodt, Nofima

Zebrafish (p. 35): Tom Ask, Aleström Lab, NMBU





norecopa

norecopa.no
post@norecopa.no
Org.no. 992 199 199

© Norecopa 2017