

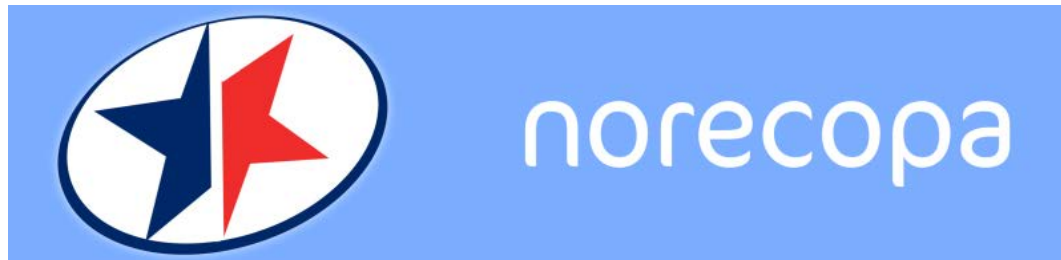
What can Norecopa do for fish researchers?

Adrian Smith

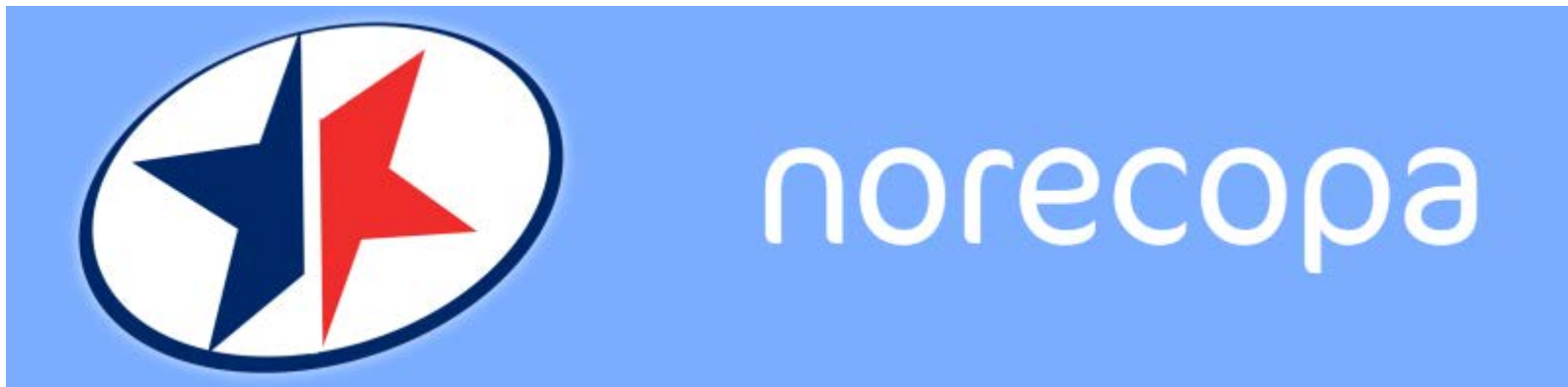
adrian.smith@norecopa.no

norecopa.no

enrich-fish.net



National Consensus Platform for the Replacement, Reduction and Refinement of Animal Experiments



a database of global 3R resources:
over 6,000 pages with over 20,000 unique links

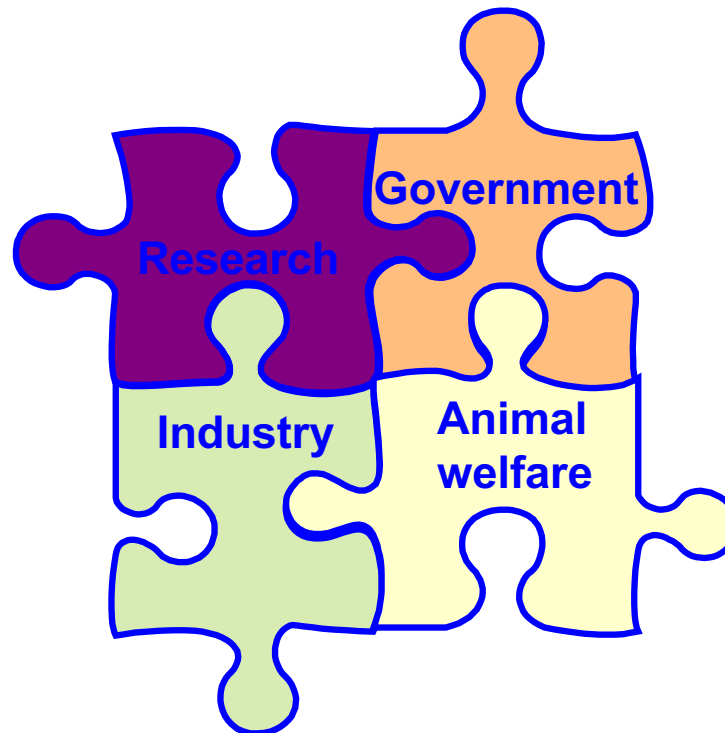
Norecopa is a member of **ecopa**

European Consensus-Platform for Alternatives

www.ecopa.eu



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



Missing mice. gaps in data plague animal research

Reports of hundreds of biomedical experiments lack essential information.

[Monya Baker](#)

05 January 2016

 [Rights & Permissions](#)

Two studies have unveiled widespread flaws in the reporting of animal experiments — the latest in a series of papers to criticize [shoddy biomedical research](#).

Whereas reports of clinical trials in major medical journals routinely state how many patients die or drop out of analysis during the course of a study, animal studies generally fail to report this figure — or drop animals without saying why, according to a team led by Ulrich Dirnagl at the Charité Medical University in Berlin. That lapse could significantly bias results, the team reports in the journal *PLoS Biology*¹.

In a second study in the same journal², a team led by John Ioannidis, an epidemiologist at Stanford University in California who has repeatedly called for more reproducible and transparent research, criticizes the lack of data availability and detailed protocols in biomedical papers.

The Board represents all 4 stakeholders:

- ***Bente Bergersen***, Norwegian Food Safety Authority, chairperson
deputy: Johan Teige, Norwegian Food Safety Authority
- ***Siri Knudsen***, University of Tromsø
deputy: Aurora Brønstad, University of Bergen
- ***Glenn Arve Sundnes***, Blom Fiskeoppdrett
deputy: Børge N. Fredriksen, Pharmaq AS
- ***Anton Krag***, Norwegian Animal Protection Alliance
deputy: Harald Small, Norwegian Society for Protection of Animals

Representation on other committees/fora:

- *Board of the Danish 3R Centre*
- *Danish National Committee*
- *Education & Training Platform (ETP-LAS) in Europe*
- *AALAS-FELASA working group on Harm-Benefit Analysis*

International consensus meetings

Harmonisation of the Care and Use of:

Fish (2005)

Wildlife (2008)

Fish (2009)

Agricultural animals (2012)

Wildlife (26-27 October 2017)

[*http://norecopa.no/consensus-meetings*](http://norecopa.no/consensus-meetings)

All presentations and consensus statements are on the internet: a lasting resource



TRAINING SCHOOL IN EXPERIMENTAL DESIGN & STATISTICAL ANALYSIS OF BIOMEDICAL EXPERIMENTS



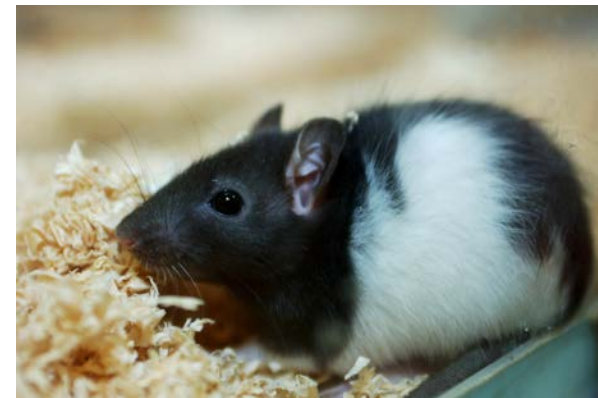
FRAME Training School
in Norway,

1 – 3 February 2016



Joining Information

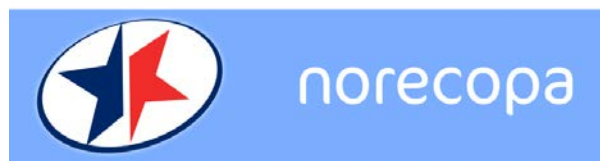
norecopa.no/other-resources/experimental-design-and-reporting



Systematic Reviews and Harm-Benefit Assessment, Voss, 27 – 28 May 2015

norecopa.no/other-resources/harm-benefit-assessment

norecopa.no/other-resources/literature-searches-and-systematic-reviews



World Congresses on Animal Use in the Life Sciences and Alternatives

Important 3R-drivers and disseminators of information:

wc9prague.org (2014)*

891 abstracts, 49 countries, 1000 participants
the next one is in August 2017 in Seattle:

wc10seattle.org

**Abstract book:*

<http://www.altex.ch/ALTEX-Proceedings/Current-Proceedings.97.html>

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

FINAL REPORT

Brussels, July 2009

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

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

Expert Working Group report on severity classification

http://ec.europa.eu/environment/chemicals/lab_animals/pdf/report_ewg.pdf

Working Party Report

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

P Hawkins (Convenor)¹, N Dennison², G Goodman³, S Hetherington⁴, S Llywelyn-Jones⁵, K Ryder⁶ and A J Smith⁶

¹Research Animals Department, RSPCA, Wilberforce Way, Southwater, West Sussex RH13 9RS, UK; ²Animals (Scientific Procedures) Inspectorate, Home Office, PO Box 6773, Dundee DD1 9WW, UK; ³Biological Services, The University of Edinburgh, Chancellor Building, 49, Little France Crescent, Edinburgh EH16 4SB, UK; ⁴CEPAS, Patefield Road, Lowestoft, NR33 0HT, UK; ⁵King's College London, Biological Services Unit, 4th floor, Hodgkin Building, Guy's Campus, London SE1 1UL, UK; ⁶Noracopa, c/o Norwegian Veterinary Institute, PO Box 750 Sentrum, N-0108 Oslo, Norway
Corresponding author: P Hawkins. Email: phawkins@rspca.org.uk

Abstract

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

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

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

Background

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

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

Guidance on the severity classification of procedures involving fish

Report from a Working Group convened by Norecopa

Designed to be a supplement to the EU Working Group report on the same subject, which most relevant for traditional lab animals

(http://ec.europa.eu/environment/chemicals/lab_animals/pdf/report_ewg.pdf)

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

Laboratory Animals, 45: 219-224, 2011

www.norecopa.no/categories

REVIEW ARTICLE

Guidelines for health and welfare monitoring of fish used in research

R Johansen¹, J R Needham^{1,2}, D J Colquhoun³, T T Poppe⁴ and A J Smith¹

¹Norwegian School of Veterinary Science, Laboratory Animal Unit, PO Box 8146 Dep., 0033 Oslo, Norway; ²The Microbiology Laboratories, North Harrow, Middlesex HA2 7RE, UK; ³Section of Fish Health, National Veterinary Institute, PO Box 8156 Dep., 0033 Oslo, Norway; ⁴Department of Basic Sciences and Aquatic Medicine, Norwegian School of Veterinary Science, PO Box 8146 Dep., 0033 Oslo, Norway

Summary

The aim of this paper is to provide background material necessary for the development of international guidelines for the health and welfare monitoring of fish used in research. It provides an overview of present guidelines and discusses why more detailed and species-specific guidelines are needed. A major issue within fish research is to document the situation today and point out areas where improvements are needed.

Keywords Fish; health; welfare; monitoring; guidelines

We need species-specific guidelines (as we have for mammals).
In many cases we also need situation-specific guidelines.

Position Statements and Guidelines

Divisjon for Innovasjon

Forskningsbehov innen dyrevelferd i Norge

Rapport fra styringsgruppen



II	Dyrevelferd i akvatisk produksjon	80
1	Innledning	80
1.1	Bevissthet, lidelse og stress hos fisk	81
1.2	Faktorer som påvirker velferden	83
1.3	Velferdsindikatorer	94
2	Velferdsproblemer og forskningsbehov hos laksefisk	98
2.1	Fysiske og kjemiske faktorer i oppdrettsmiljøet	98
2.2	Emæring og føring	103
2.3	Røkting, håndtering, og transport	104
2.4	Atferd og sosiale interaksjoner hos laksefisk	104
2.5	Sjukdomsproblemer	105
3	Velferdsproblemer og forskningsbehov hos marine fiskearter	112
3.1	Fysiske og kjemiske faktorer i oppdrettsmiljøet	112
3.2	Emæring og føring	116
3.3	Røkting, håndtering og transport	117
3.4	Atferd og sosiale interaksjoner	118
3.5	Sjukdomsproblemer	119
3.6	Bruk av leppefisk for fjerning av parasitter på laksefisk	123
4	Velferdsproblemer og forskningsbehov hos krepssdyr	125
4.1	Fysiske og kjemiske faktorer i oppdrettsmiljøet	125
4.2	Emæring og føring	126
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4.6	Avliving	128
5	Forskningsbehov relatert til velferd hos fisk og krepssdyr	129
5.1	Kognitive egenskaper og velferdsindikatorer	129
5.2	Faktorer som påvirker fiskens velferd	129

Norges forskningsråd

Statens landbruksforvaltning
Norwegian Agricultural Authority



Position Statements and Guidelines

- Food deprivation
- Toe clipping
- Pain relief
- Fin clipping of fish
- Biometric methods of identification
- Methods for identification of birds



The screenshot shows the Norecopa website. The header is a solid blue bar. On the left is the Norecopa logo, which consists of a white circle containing a blue star on the left and a red star on the right. To the right of the logo is the word "norecopa" in white lowercase letters. In the top right corner of the header, the text "NORSK" is followed by "ENGLISH" which is underlined. Below the header is a white breadcrumb trail: "norecopa.no / About Norecopa / Position Statements". To the right of the breadcrumb trail are four social media icons: Facebook, Twitter, Email, and a plus sign. The main content area has a white background. The title "Position Statements about animal experimentation" is displayed in a large, bold, black font. Below the title is a paragraph of text: "Norecopa produces position statements on topics related to the use of animals in research and the 3Rs."

norecopa.no / About Norecopa / Position Statements

[f](#) [t](#) [e](#) [+](#)

Position Statements about animal experimentation

Norecopa produces position statements on topics related to the use of animals in research and the 3Rs.

Use of in vivo tests in the development and testing of fish vaccines

Norecopa arranged a working group meeting in March 2016 with all Norway's vaccine companies

The group produced an anonymous consensus document with suggestions on how to increase implementation of the 3Rs



You are here : [Home](#) > [About us](#) > [Newsroom](#) > [EDQM Symposium on Challenges of Quality Requirements for Fish Vaccines](#)

EDQM Symposium on Challenges of Quality Requirements for Fish Vaccines

Norecopa's annual general meetings and seminar:

Adamstua, 24 May 2016:

1000 - 1045: Annual General Meeting

1050 - 1110: Norecopa's 3R-prize: nominees and winner

1115 - 1200: ***Putting tags and transmitters in birds: are our guidelines flights of fantasy?*** Professor Rory Wilson, Swansea University

1200 - 1230: Buffet lunch

1230 - 1315: ***How to construct a proper literature search when planning an experiment***
Information Specialist Alice Tillema, Radboud University, Nijmegen

1330 - 1530: Practical training in literature searching

Next meeting: 7 June 2017 at Adamstua, Oslo

Integrating natural science and technology:

Fish and fish robots



Prof. Maarja Kruusma



Collaboration with animal welfare organisations

The screenshot shows the RSPCA website's navigation menu on the left, including links for Campaigns, Animal Care, Search, About the RSPCA, Advice Centre, News, Campaigns, Good Business Awards, Animal Care, Rehoming, How you can help, Education, Science Group, Freedom Food, Local RSPCA, RSPCA International, Publications, Careers, and Under 8teenz. The main content area is titled 'Reducing suffering - Rabbit welfare' and features a central report cover titled 'Refining rabbit care' by RSPCA and UFAW. To the right, there are three sections: 'Reducing suffering: introduction', 'Refinement', and 'Rodent welfare', each with a small image and a 'more' link. At the bottom, there is a section for the 'UFAW/RSPCA Rabbit Behaviour and Welfare Group' with a brief description of its work.

AND ADVICE
0300 1234

ONLINE

Campaigns

Animal Care

SEARCH

ABOUT THE RSPCA

ADVICE CENTRE

NEWS

CAMPAIGNS

GOOD BUSINESS AWARDS

ANIMAL CARE

REHOMING

HOW YOU CAN HELP

EDUCATION

SCIENCE GROUP

FREEDOM FOOD

LOCAL RSPCA

RSPCA INTERNATIONAL

PUBLICATIONS

CAREERS

UNDER 8TEENZ

RSPCA PET INSURANCE

My RSPCA

Help

Reducing suffering - Rabbit welfare

[back to research animals home](#)

Refining rabbit care
A resource for those working with rabbits in research

Thousands of rabbits are used in research and testing throughout the European Union every year, mostly in pharmaceutical research and development. The lives of laboratory rabbits can be greatly improved by providing housing and care that caters for their physical and behavioural needs.

Reducing suffering: introduction

For as long as animals are used in research and testing, every step must be taken to reduce suffering and improve welfare... [more](#)

Refinement

The research animals department promotes initiatives that will lead to improvements in laboratory animal housing and care and reductions in suffering caused by procedures... [more](#)

Rodent welfare

Working to improve the welfare of laboratory rodents is extremely important because the vast majority of animals used in research and testing are mice and rats... [more](#)

Rabbit welfare

The lives of laboratory rabbits can be greatly improved by providing housing and care that caters for their physical and behavioural needs... [more](#)

UFAW/RSPCA Rabbit Behaviour and Welfare Group

During 2008, the UFAW/RSPCA Rabbit Behaviour and Welfare Group published a report providing practical guidance on refining laboratory rabbit husbandry

www.rspca.org.uk/sciencegroup/researchanimals

**Guidance on the housing
and care of
Zebrafish**
Danio rerio



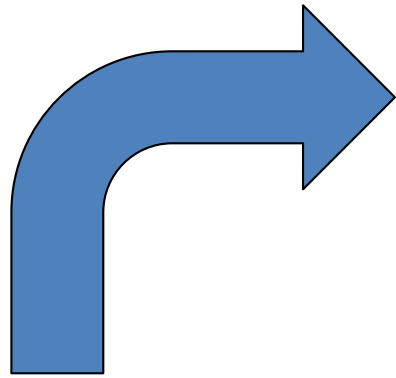
Barney Reed & Maggy Jennings
Research Animals Department, Science Group, RSPCA

**Compendium
in
Laboratory Animal
Science
for
Fish Researchers**

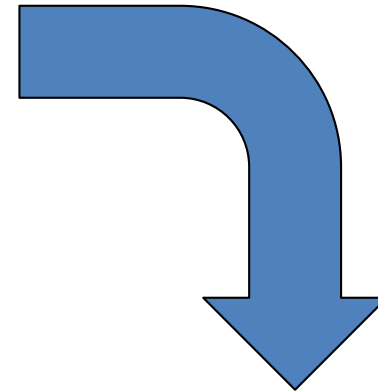
edited by
Trond Brattelid & Adrian J. Smith



**Norwegian School of Veterinary Science
& Norecoba
June 2011**

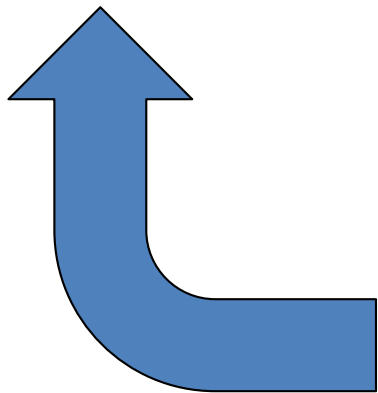


Literature
search

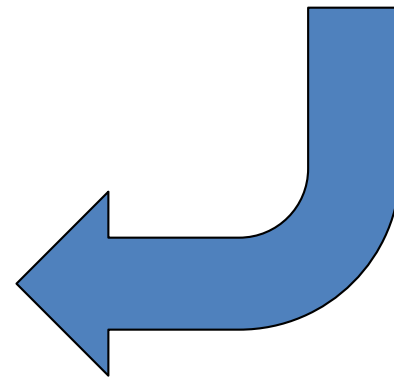


Reporting

Planning



Research



Alice Tillema, Radboud University:
How to construct a literature search

<http://norecopa.no/how-to-construct-a-literature-search.pdf>

How to construct a literature search

Alice Tillema, Medical Library, Nijmegen

<http://libguides.ru.nl/norecopa>



Radboud University



Radboudumc
university medical center

ENVIRONMENT

European Commission

European Commission > Environment > Chemicals > Animals used for scientific purposes

Home About us Policies Funding Legal compliance News & outreach

Animals used for scientific purposes

Retrieval and provision of information on the "Three Rs" and alternatives

Accessing accurate, relevant and up-to-date information on the Three Rs is a challenge for all those use of animals.

Legislation and implementation

- EU legislative framework
- Implementation of Directive 2010/63/EU
- Q&A and guidance documents

The "Three Rs" and alternative approaches

- Replacement, Reduction and Refinement – the "Three Rs"
- Validation, acceptance and use
- EU activities to advance alternatives
- Member State activities to advance alternatives
- Finding and distributing information on alternatives
- Key resources**
 - Search Tools
 - Databases
 - Portals and web-sites
 - Journals
 - Other resources and organisations

Animals used for scientific purposes



Opinions of European Commission Expert Committees related to the use of animals in experiments

Why is 3R literature hard to find?

- Bibliographic databases are often not used adequately (poor overlapping between the databases)
- Too few scientists are aware of the specialist 3R-databases
- Scientists rarely use "3R" words when they write titles/abstracts/keywords for their papers
- Databases rarely flag 3R-papers with explicit thesaurus terms ☹️
- We have no single "Journal of Alternatives"

The title and abstract are critical, because they are often the only parts that are indexed. They must be informative and contain 3R-terms!

**The development of Response Surface Pathway
Design in toxicity studies**

**The development of Response Surface Pathway
Design **to reduce animal numbers** in toxicity studies**

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

Visibility! Not necessarily in a high-impact journal.

Methods of positioning fish for surgery or other procedures out of water

Trond Brattelid & Adrian J. Smith

Laboratory Animal Unit, Norwegian School of Veterinary Science, PO Box 8146 Dep., N-0033 Oslo, Norway



Lateral thinking between species



Laboratory Animals, 2000, 34,
430-433

"Simple" techniques?



Photo: T. Poppe, NMBU



http://blogs.discovermagazine.com/notrocketscience/2011/01/12/flipper-bands-impair-penguin-survival-and-breeding-success/#.VLU6_8Y7_wo



Photo: NMBU

Refinement to avoid **contingent suffering**

(not just direct suffering caused by the procedure)

e.g. fear, boredom, discomfort

which may be caused by

e.g. transport, housing, husbandry, social hierarchy

The Lonely Mouse

Single-housed male mice show symptoms of what in humans would be characterised as depression

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0111065>



Taperfiskene er stresset, apatiske og anorektiske

IDA BEITNES JOHANSEN | ØYVIND ØVERLI | MARCO VINDAS
OPPDATERT: 05.JAN.2017 12:31 | PUBLISERT: 04.JAN.2017 21:30

aftenposten.no

Brain serotonergic activation in growth-stunted farmed salmon: adaption versus pathology

Marco A. Vindas, Ida B. Johansen, Ole Folkedal, Erik Höglund, Marnix Gorissen, Gert Flik, Tore S. Kristiansen, Øyvind Øverli

Published 25 May 2016. DOI: [10.1098/rsos.160030](https://doi.org/10.1098/rsos.160030)



photos: Ole Folkedal

An useful additional (but largely unknown) tool...

Carol M. Newton (1925-2014)



National Library of Medicine

The three S's

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

**We can do this ourselves without scientific literature!*

Carol M Newton, quoted in Rowsell HC (1977): *The Ethics of Biomedical Experimentation in The Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing* pp. 267-281, National Academy of Sciences, Washington, D.C., ISBN 0-309-02603-2.

Smith AJ & Hawkins P: *Good Science, Good Sense and Good Sensibilities: The Three Ss of Carol Newton* Submitted to *Animals*, August 2016.

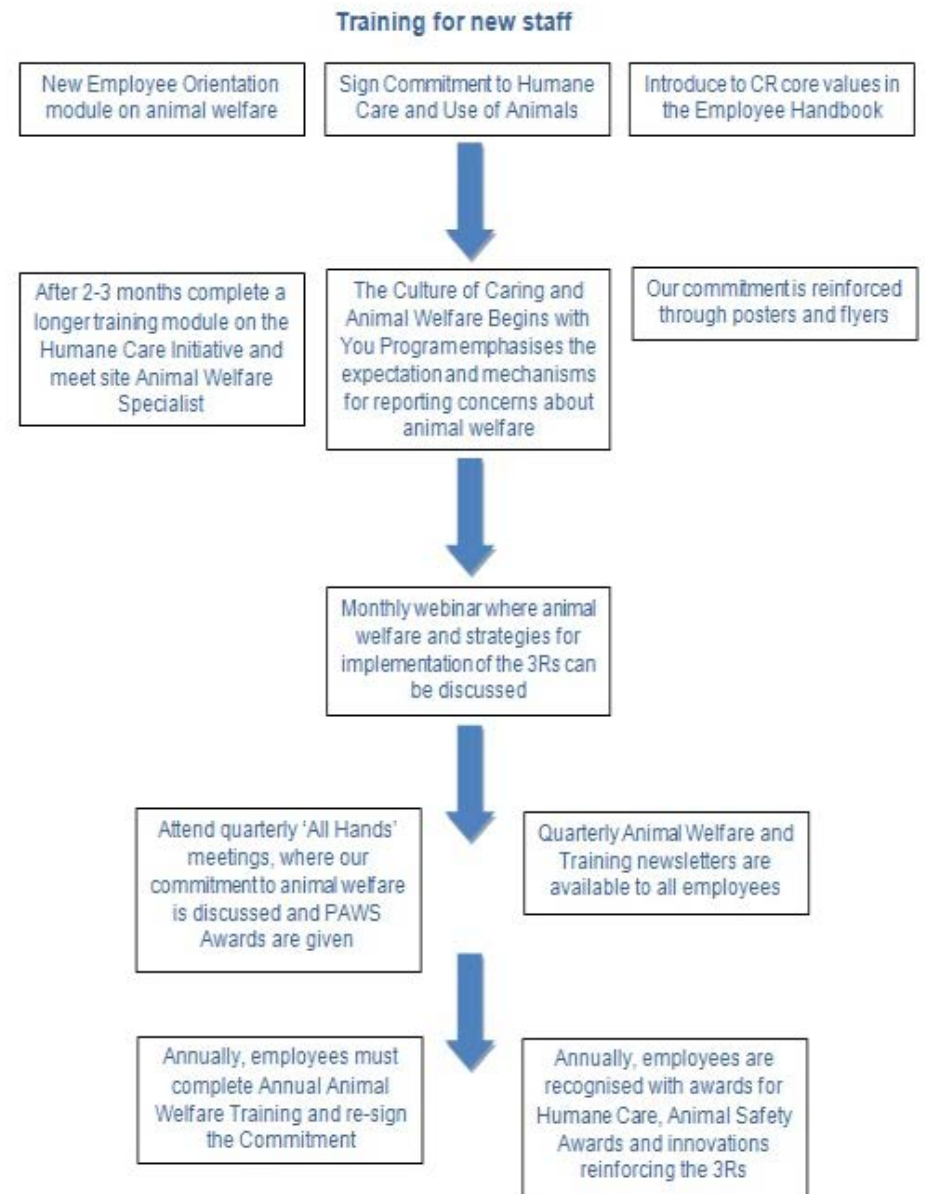


Creating a culture of care

Friday 22 August 2014

Dr Marilyn Brown, Corporate Vice President of Global Animal Welfare at the contract research organisation Charles River, has many years of experience managing experimental facilities and animal care programmes.

<https://www.nc3rs.org.uk/news/creating-culture-care>



Establishing a Culture of Care, Conscience, and Responsibility: Addressing the Improvement of Scientific Discovery and Animal Welfare Through Science-based Performance Standards

H. J. Klein and K. A. Bayne

Address correspondence and reprint requests to Dr. Klein, Merck Research Laboratories, WP42-211, West Point, PA 19486, or email Hilton_klein@merck.com.

<http://ilarjournal.oxfordjournals.org/content/48/1/3.full>

New planning guidelines: PREPARE

*Planning Research involving Experimental Procedures on Animals:
Recommendations for Excellence*

- Complementary to reporting guidelines such as ARRIVE
- Cover all aspects (not just those which are reported), including **checklists** for
 - management of the animal facility
 - all the practical details of an animal experiment from acquisition of the animals to waste disposal
 - division of labour and responsibilities between the facility and research group
 - submitted to an Open Access journal

norecopa.no/PREPARE



norecopa

NORSK ENGLISH

[About Norecopa](#) [Alternatives](#) [Databases & Guidelines](#) [Education & training](#) [Legislation](#) [Meetings](#) [News](#) [Other resources](#) [Species](#) [Feedback](#)

Search all Norecopa's databases and webpages simultaneously:



[Welcome to Norecopa's new website!](#)

[Search engine help file](#)

More about Norecopa's databases: [3R Guide](#) - [NORINA](#) - [TextBase](#) - [Classic AVs](#)

norecopa.no

Webpages plus:

3R Guide
www.3RGuide.info

Databases, Guidelines, Regulations, Information Centres, Journals, E-mail lists



Audiovisual products

NORINA

oslovet.norecopa.no/NORINA



Textbooks

TextBase

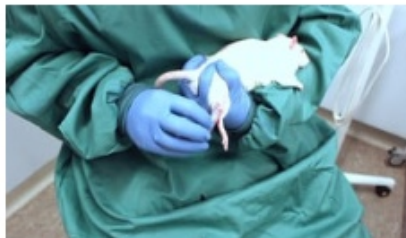
oslovet.norecopa.no/textbase

Norecopa's Videos

29 Videos

0 Appearances

29 Total

Sort: [Date](#) | [Alphabetical](#) | [Plays](#) | [Likes](#) | [Comments](#) | [Duration](#)**Blood sampling of the rat from the saphenous vein**

8 months ago

**Handling rats: keep them warm**

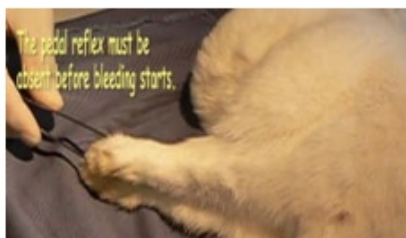
8 months ago

**Immobilisation of the mouse for intraperitoneal injection**

1 year ago

**Cardiac puncture in the terminally anaesthetized mouse**

1 year ago

**Pedal reflex in the rabbit**

1 year ago

**Immobilisation of the mouse**

1 year ago



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Search:

[About Norecoba](#) | [Alternatives](#) | [Databases & Guidelines](#) | [Education & training](#) | [Legislation](#) | [Meetings](#) | [News](#) | [Other resources](#) | [Species](#) | [Feedback](#)

[Anaesthesia and analgesia](#) | [Animal facilities](#) | [Animal welfare organisations](#) | [Blood sampling](#) | [Email discussion lists](#) | [Environmental enrichment](#) | [Ethics](#) | [Experimental design and statistical analysis](#) | [Harm-Benefit Assessment](#) | [Health monitoring](#) | [Journals](#) | [Organisations](#) | [Severity classification](#) | [Suppliers](#) | [Systematic reviews](#)

norecoba.no / [Other resources](#) /

Search all Norecoba's databases and webpages simultaneously:

Add search term



Organisations of relevance to animal research

Organisations within Laboratory Animal Science

[AAALAC International](#) (Association for Assessment and Accreditation of Laboratory Animal Care International)

[AALAS](#) (American Association for Laboratory Animal Science)

[ACLAM](#) (American College of Laboratory Animal Medicine)

[AniMatch](#) (an online sharing platform for the exchange of organs and tissues)

[ARSAL](#) (Asociatia Româna pentru Stiinta Animalelor de Laborator; Romanian Laboratory Animal Science Association)

[ASLAP](#) (American Society of Laboratory Animal Practitioners)

Animals in research:



Fish



Farm animals



Laboratory animals



Wildlife and wild fish



Cephalopods



Other aquatic animals

Norecopa promotes use of "The Three Rs":

Replace

Replacement of animal experiments with alternatives

Reduce

Reduction of the number of animals used in experiments

Refine

Reduction of pain and suffering in animal experiments

Norecopa aims for consensus between the four stakeholders:

Government and Regulatory Authorities - Research and teaching - Industry - Animal protection and welfare

Position Statements and Guidelines



- [Alternatives](#)
- [Anaesthesia and analgesia](#)
- [Behaviour](#)
- [Education and training](#)
- [Environmental enrichment](#)
- [Guidelines](#)
- [Handling](#)
- [Health monitoring and disease prevention](#)
- [Humane killing](#)
- [Legislation](#)
- [Marking and identification](#)
- [Meetings](#)
- [Organisations](#)
- [Pain and suffering](#)
- [Projects](#)
- [Reports](#)
- [Sampling](#)
- [Surgery](#)
- [Welfare](#)
- [Zebrafish](#)

norecopa.no / Fish / **Welfare**



Fish welfare

- > [Guidelines for health and welfare monitoring of fish used in research](#)
- > [On-farm evaluation of the Salmon Welfare Index Model \(SWIM 1.0\): theoretical and practical considerations](#)
- > [Huntingford et al. 2006](#) "Current issues in fish welfare"
- > [The EU-WEALTH project](#) aims to gain an in-depth understanding of factors affecting welfare and health of farmed fish

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NIH Animal Research Advisory Committee Guidelines for Survival Bleeding of Mice and Rats
3R Guide/10891
These guidelines have been developed to assist investigators and National Institutes of Health (NIH) Animal Care and Use Committees (ACUC) in their choice and application of survival rodent bleeding techniques.

Blood sampling
Blood sampling is one of the commonest procedures conducted on research animals, but it may cause pain, distress and lasting harm if the technique is poor, or if too much of the circulating blood volume is removed. Videos and slide series showing blood sampling techniques on several common laboratory animal species. Links NC3Rs Microsite on blood sampling Films and slide shows on bleeding techniques...

Blood Collection in Mice Using the Saphenous Vein - An Alternative to Retro Orbital Collection
NORINA/8641
These web pages describe a method for blood collection from the saphenous vein of mice, rats, hamsters, gerbils, guinea-pigs, mink and ferrets. Type of record: Web pages. Category: Veterinary Medicine

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ENRICH Fish website

enrich-fish.net

ENRICH Fish

ENRICH Fish (*Using optimised [environmental enrichment](#) to improve the rearing conditions and welfare of Atlantic salmon in relation to [the Three Rs](#)*) is a project financed by the [Research Council of Norway](#)  to improve the rearing conditions and welfare of Atlantic salmon used in laboratory experiments. This two-year project started in March 2015.

The project consists of three parts:

1. 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
2. Efforts to provide social enrichment by optimising group size and investigating the effect of changing rearing unit volume on acclimation and behaviour
3. Construction of a multi-stakeholder platform for synergy, recommendations and dissemination of results. This part includes two annual workshops.

[Presentations from the seminars, results, links to other resources](#)

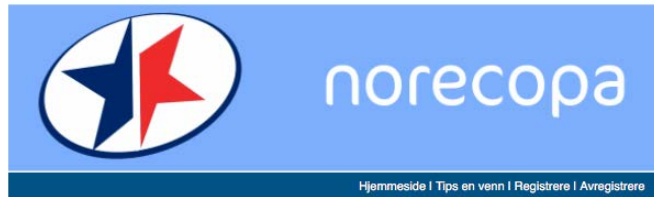


Norecopa's 3R prize
(30,000 kroner + diploma)

Deadline for nominations: 15 March

Newsletter 7-8 times a year

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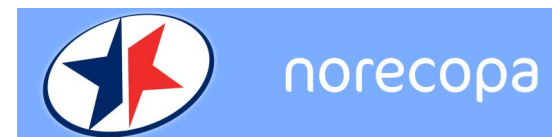
Dette brevet inneholder følgende saker:

- Nå er det på tide å nominere til 3R-prisen!
- Nye nettsider for Norecoba
- Arbeidsseminar om design og statistikk
- Frist for sammendrag til FELASA
- Nettbasert kurs om sørafisk
- Ny modul om dyrevelferd fra Newcastle
- Forbedring av fiskeforsøk
- Rådet for dyreetikk har fått nye medlemmer
- Nyheter fra 3R-sentre og komitéer
- UiB-nettside om 3R
- Glimt fra forskningen
- Merking av vilt
- Registrering av smerte hos sau



Thanks to our members:

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