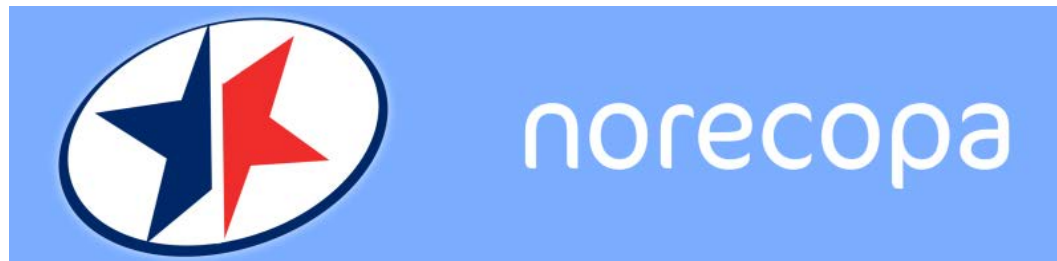


What can Norecopa do for fish researchers?

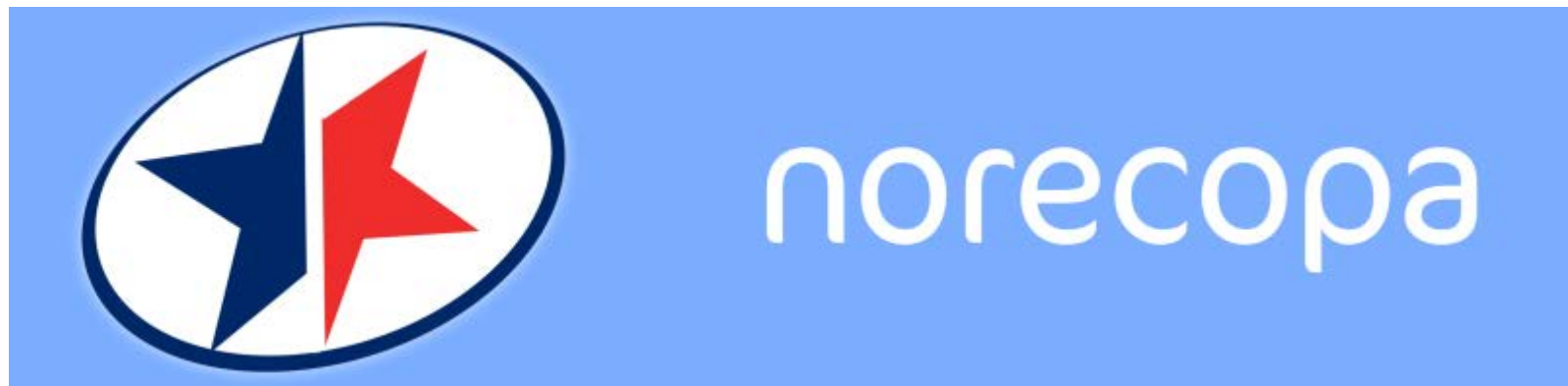
Adrian Smith

adrian.smith@norecopa.no

www.norecopa.no



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



a competence centre for the 3RS

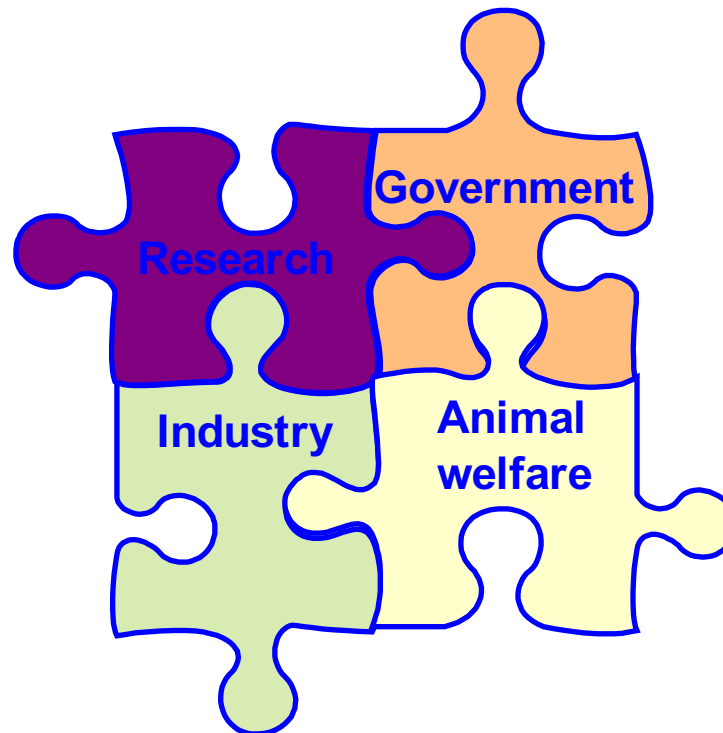
Norecopa is a member of **ecopa**

European Consensus-Platform for Alternatives

www.ecopa.eu



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



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***, MSD Animal Health Innovation AS
deputy: Terje Tingbø, 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*
- *Norwegian National Committee?*

Norecopa is registered in Brønnøysund with

- *statutes*
- *its own Board*
- *Annual General Meeting as the highest organ*
- *secretariat (50% position) attached to the Norwegian Veterinary Institute*

Norecopa's budget from the State for 2016 is NOK

1.300.000,-

In addition: members fees (NOK 200/1000,- per year) and support from other sources

Total budget in 2016: NOK 2.256.000

International consensus meetings

Harmonisation of the Care and Use of:

Fish (2005)

Wildlife (2008)

Fish (2009)

Agricultural animals (2012)

<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

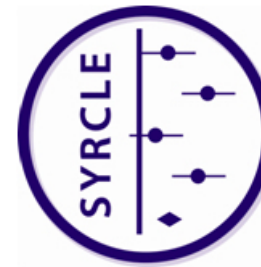


Joining Information

<http://www.frame.org.uk/training-schools>



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



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 September 2017 in Seattle)*

Abstract book:

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

Update on best practice approaches to the welfare and husbandry of fish, cephalopods and decapods

Adrian J Smith¹, Penny Hawkins², Tore Kristiansen³ and Cecilie Mejdell⁴

¹Norecopa, P.O. Box 750 Sentrum, N-0106 Oslo, Norway; ²Research Animals Department, RSPCA, Wilberforce Way, Southwater, West Sussex, RH13 9RS, UK; ³Institute of Marine Research, P.O. Box 1870 Nordnes, Bergen, Norway; ⁴Norwegian Veterinary Institute, P.O. Box 750 Sentrum, N-0106 Oslo, Norway

Fish account for 12% of the 11.5 million research animals used annually in the EU, an increase of nearly 30% since 2008. The number of cephalopods (including squid, octopuses and cuttlefish) and decapod crustaceans (e.g. crabs and lobsters) is unknown because regulation of cephalopod use by Directive 2010/63/EU began in January 2013 and decapod use is still out of scope. However, several countries (e.g. Austria, New Zealand and Norway) do regulate the use and humane killing of decapods, and there is support for the view that these animals should be given the benefit of the doubt regarding ability to suffer and need to refine housing, care and procedures.

Since there are over 30,000 species of fish, living in a large range of habitats, as well as a diversity of cephalopods and decapods, there is a clear need for species-specific, science-based guidelines on the care and use of the species used in research. It is generally accepted that fish are sentient and should be protected as other vertebrates, but there is still debate about aquatic invertebrates. Large decapod crustaceans show complex behaviour and appear to have some degree of awareness, with systems for nociception and considerable learning ability. For example, recent research on crayfish suggests that the hormone serotonin is involved in the mediation of anxiety and stress in crayfish, as in humans.

The EU can conduct thematic reviews of the Directive, including new scientific knowledge, and the growing weight of evidence on pain perception in decapods could be the basis for such a review.

Severity classification

Directive 2010/63/EU requires the severity of procedures to be classified as 'non-recovery', 'mild', 'moderate' or 'severe', using criteria set out by the European Commission. A 2009 EC Working Group report provides examples of such procedures, but not all are relevant to aquatic species.

A working group set up by the Norwegian Consensus-Platform for the 3Rs, Norecopa (www.norecopa.no) gives supplementary guidance on severity classification in fish research, including examples of 'subthreshold', 'mild', 'moderate', 'severe' and 'upper threshold' procedures. This will make it easier for fish researchers to implement the Directive.

More information is available at www.norecopa.no/categories



Photo: VESIO Vian

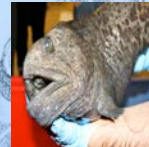


Photo: Aurora Branstad



Photo: http://it.wikipedia.org/wiki/Scopa_piliformis

Two *international consensus meetings on the care and use of fish in research* were held by the Norwegian School of Veterinary Science and Norecopa. All presentations and consensus documents with recommendations are available at www.norecopa.no/consensus-meetings.

There is evidence for increased neural and behavioural complexity, growth rate and learning performance in animals given an enriched environment. Papers on environmental enrichment are beginning to emerge. There is a great need for more research in this area.



Squid: http://en.wikipedia.org/wiki/File:Caligo_vulgaris.jpg; Octopus: http://en.wikipedia.org/wiki/Common_octopus



Searching for the few guidelines and other 3R resources on fish, cephalopods and decapods that *do* exist can be a daunting task. Norecopa, in collaboration with the US Animal Welfare Information Center (AWIC), has recently launched a database, *3R Guide* (www.3R-Guide.info) providing a global overview of guidelines, databases, regulations, email lists and journals. All entries are classified by Type (e.g. database), Category (e.g. fish) and 3R Relevance (e.g. Refinement). *3R Guide* is an essential starting point when searching for 3R resources for aquatic species.

Guidelines for the care and welfare of cephalopods are being jointly drawn up by CephRes (a non-profit association aimed to promote the advancement of biological research on cephalopods), The Boyd Group (a UK-based discussion forum on the use of animals in science) and FELASA (the Federation of European Laboratory Animal Associations).

The UK Home Office is drafting a **Code of Practice** for animal care that includes fish and cephalopods, which should be published by the end of 2014.

Charles River UK offers courses covering Home Office modules 1-4 for those using fish and cephalopods.

Methods are being developed to refine the use of crustaceans to monitor effects of environmental changes on marine animals, for example in connection with oil extraction and CO₂ storage. External sensors measure heart frequency in crabs and shell closure time in mollusks, after which the animals can be returned to their original environment:



Photos: Shaw Bamber, International Research Institute of Stavanger

Conclusions

A number of useful resources are emerging for improving the welfare and husbandry of fish, cephalopods and decapods – but there is still a pressing need for species-specific guidelines. Hopefully, the requirement in the new EU Directive (Article 49) for National Committees to share good practice and exchange information on the operation of animal welfare bodies will increase the flow of information and raise standards.

Norecopa has set up a website with references and links to more information on the welfare and husbandry of fish, cephalopods and decapods:

www.norecopa.no/aquatics

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 Ryder² and A J Smith⁶

¹Research Animals Department, BPECA, Wilberforce Way, Southwater, West Sussex RH13 9RS, UK; ²Animals (Scientific Procedures) Inspectorate, Home Office, PO Box 6779, Dundee DD1 9WW, UK; ³Biological Services, The University of Edinburgh, Chancellor Building, 49, Little France Crescent, Edinburgh EH8 8JB, UK; ⁴CERAS, Paleside Road, Lowestoft, NR33 0HT, UK; ⁵King's College London, Biological Services Unit, 4th floor, Hodgkin Building, Guy's Campus, London SE1 1UL, UK; ⁶Norecopa, c/o Norwegian Veterinary Institute, PO Box 750 Sentrum, N-0108 Oslo, Norway
Corresponding author: P Hawkins. Email: phawkins@spca.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 'subthreshold', '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 Burch,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)

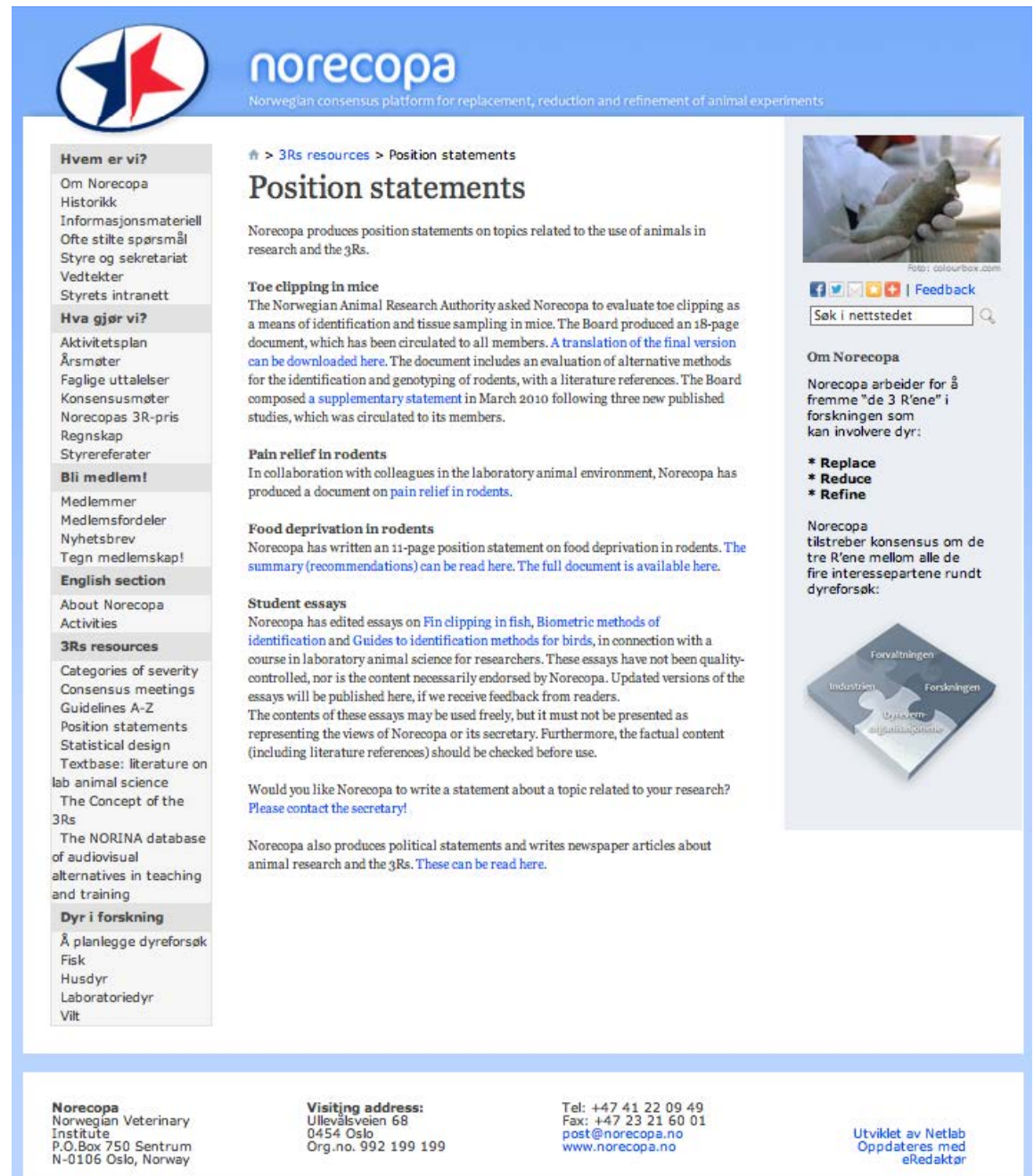
P Hawkins, N Dennison, G Goodman, S Hetherington, S Llywelyn-Jones, K Ryder and AJ Smith

Laboratory Animals, 45: 219-224, 2011

www.norecopa.no/categories

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, which is a Norwegian consensus platform for replacement, reduction and refinement of animal experiments. The page is titled "Position statements" and is part of the "3Rs resources" section. The main content area lists several position statements: "Toe clipping in mice", "Pain relief in rodents", "Food deprivation in rodents", and "Student essays". Each statement is accompanied by a brief description of the document and a link to the full version. A sidebar on the left contains a navigation menu with categories such as "Hvem er vi?", "Hva gjør vi?", "Bli medlem!", "English section", "3Rs resources", and "Dyr i forskning". A search bar is located at the top right of the page. The footer contains contact information for Norecopa, including the address, phone number, fax, and email, as well as the website URL. The page is developed by Netlab and updated by eRedaktør.

norecopa
Norwegian consensus platform for replacement, reduction and refinement of animal experiments

☛ > 3Rs resources > Position statements

Position statements

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

Toe clipping in mice
The Norwegian Animal Research Authority asked Norecopa to evaluate toe clipping as a means of identification and tissue sampling in mice. The Board produced an 18-page document, which has been circulated to all members. [A translation of the final version can be downloaded here.](#) The document includes an evaluation of alternative methods for the identification and genotyping of rodents, with a literature references. The Board composed a [supplementary statement](#) in March 2010 following three new published studies, which was circulated to its members.

Pain relief in rodents
In collaboration with colleagues in the laboratory animal environment, Norecopa has produced a document on [pain relief in rodents](#).


Food deprivation in rodents
Norecopa has written an 11-page position statement on food deprivation in rodents. [The summary \(recommendations\) can be read here.](#) [The full document is available here.](#)

Student essays
Norecopa has edited essays on [Fin clipping in fish](#), [Biometric methods of identification](#) and [Guides to identification methods for birds](#), in connection with a course in laboratory animal science for researchers. These essays have not been quality-controlled, nor is the content necessarily endorsed by Norecopa. Updated versions of the essays will be published here, if we receive feedback from readers. The contents of these essays may be used freely, but it must not be presented as representing the views of Norecopa or its secretary. Furthermore, the factual content (including literature references) should be checked before use.

Would you like Norecopa to write a statement about a topic related to your research? [Please contact the secretary!](#)

Norecopa also produces political statements and writes newspaper articles about animal research and the 3Rs. [These can be read here.](#)

Om Norecopa
Norecopa arbeider for å fremme "de 3 R'ene" i forskningen som kan involvere dyr:
*** Replace**
*** Reduce**
*** Refine**
Norecopa tilstreber konsensus om de tre R'ene mellom alle de fire interessepartene rundt dyreforsøk:



Forvaltningen
Industri
Forskningen
Opplysningsvesenetsvesen
dyreforsøk

Norecopa
Norwegian Veterinary Institute
P.O.Box 750 Sentrum
N-0106 Oslo, Norway

Visiting address:
Ullevålsveien 68
0454 Oslo
Org.no. 992 199 199

Tel: +47 41 22 09 49
Fax: +47 23 21 60 01
post@norecopa.no
www.norecopa.no

Utviklet av Netlab
Oppdateres med eRedaktør

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

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

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

To be followed up at the EDQM meeting in Oslo in May



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

Integrating natural science and technology:

Fish and fish robots



Prof. Maarja Kruusma





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

Will be awarded for the 7th time on 24 May 2016

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 link to 'back to research animals home'. The central focus is a report titled 'Refining rabbit care' by RSPCA and UFAW, which provides a resource for those working with rabbits in research. The report's abstract states: '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.' Below this, the 'UFAW/RSPCA Rabbit Behaviour and Welfare Group' is mentioned, along with a note that during 2008, the group published a report providing practical guidance on refining laboratory rabbit husbandry. To the right of the report are three sections: 'Reducing suffering: introduction', 'Refinement', and 'Rodent welfare', each with a 'more' link. The 'Introduction' section states: 'For as long as animals are used in research and testing, every step must be taken to reduce suffering and improve welfare...'. The 'Refinement' section states: 'The research animals department promotes initiatives that will lead to improvements in laboratory animal housing and care and reductions in suffering caused by procedures...'. The 'Rodent welfare' section states: '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...'. The 'Rabbit welfare' section states: 'The lives of laboratory rabbits can be greatly improved by providing housing and care that caters for their physical and behavioural needs...'. The page also features a 'PET INSURANCE' logo and a 'My RSPCA Help' link at the bottom left.

RSPCA ONLINE

AND ADVICE 0300 1234

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.

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

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](#)

www.rspca.org.uk/sciencegroup/researchanimals



A resource book for
lay members of ethical
review and similar
bodies worldwide

3rd edition

January 2015

Maggy Jennings and Jane A. Smith

**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**

Collaboration with other centres



UCCAA

University of California
Center for Animal Alternatives

www.lib.ucdavis.edu/dept/animalalternatives



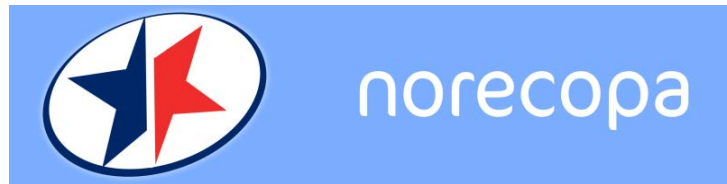
USDA



**Animal Welfare
Information
Center**

U.S. DEPARTMENT OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY

awic.nal.usda.gov



AJ Smith & T Allen, 2005

***The use of Databases, Information Centres and Guidelines
when planning research that may involve animals***

Animal Welfare, 14 (4): 347-359

<http://oslovet.norecopa.no/SmithAllen.pdf>

This led to the construction of: **3R Guide**



www.3RGuide.info

search.norecopa.no

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

search.norecopa.no is an intelligent search engine for

Norecopa's four databases:

- **3R Guide** : Information on databases, guidelines, information centres, email lists and journals of relevance to laboratory animal science and the 3Rs
- **NORINA**: Information on over 3,500 alternatives or supplements to animal use in education and training
- **TextBase**: Information on over 1,600 textbooks within laboratory animal science and related subjects
- **Classic AVs** : A subset of NORINA containing products using older technology

The search engine takes into consideration:

- the words which have been entered by the user
- an index of all the words in the databases
- a list of synonyms constructed by Norecopa specifically for these databases
- an "auto-complete" function which suggests search terms based on the search engine's own dictionary
- algorithms which prioritise or suppress words depending on their relevance
- Boolean operators, which the user can edit
- "fuzzy logic" (words resembling those entered by the user)

http://search.norecopa.no

Guidelines bleeding mice

Search

Help Enable synonyms and stemming Reset

Did you mean: guideline breeding mice(4)

Auto-complete function:

- blood
- blood
- blood collection
- blood from
- blood sampling

Category

- Agricultural animals (5)
- Anaesthesia (3)
- Anaesthesia and analgesia (4)
- Anatomy (175)
- Aquatic animals (4)
- Behaviour (4)
- Behavioural research (3)
- Biochemistry (7)
- Biology (4)
- Birds (5)
- Blood sampling (12)
- Cancer research (3)
- Design (7)
- Disease research (3)
- Dissection (7)
- Education and training (3)

Synonym list:

Bleeding, bloodsampling, blood sampling, venepuncture, blood collection, phlebotomy



Velkommen til Norecopa

Latest news:

- Den endelige versjonen av [Mattilsynets instruks for forsøksdyrforvaltningen](#) er lagt ut på Norecopas nettsider (20.08.15)

Hvem er vi?

[Om Norecopa](#)
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[Styre og sekretariat](#)
[Vedtakter](#)
[Styrets intranett](#)

Hva gjør vi?

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[Faglige uttalelser](#)
[Konsensusmøter](#)
[Norecopas 3R-pris](#)
[Regnskap](#)
[Styrereferater](#)
[Årsmøter](#)

Bli medlem!

[Medlemmer](#)
[Medlemsfordeler](#)
[Nyhetsbrev](#)
[Tegn medlemskap!](#)

English section

[About Norecopa](#)
[Activities](#)

3Rs resources

[3R Guide](#)
[Aquatic animals](#)
[Categories of severity](#)
[Consensus meetings](#)
[NORINA](#)
[Position statements](#)
[Statistical design](#)
[Systematic Reviews](#)
[Textbase](#)
[The 3Rs concept](#)

Dyr i forskning

[EU direktivet](#)
[2010/63/EU](#)
[Fisk](#)
[Husdyr](#)
[Laboratoriedyr](#)
[Vilt](#)
[Å planlegge et dyreforsøk](#)



Foto: colourbox.com



[Følg Norecopa på Facebook](#)

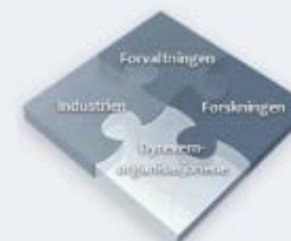
Søk...

Om Norecopa

Norecopa arbeider for å fremme "de 3 R'ene" i forskningen som kan involvere dyr:

- * **Replace**
- * **Reduce**
- * **Refine**

Norecopa tilstreber konsensus om de tre R'ene mellom alle de fire interessepartene rundt dyreforsøk:





Hvem er vi?

Om Norecopa
Historikk
Informasjonsmateriale
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Vedtekter
Styrets Intranett

Hva gjør vi?

Aktivitetsplan
Faglige uttalelser
Konsensusmøter
Norecopas 3R-pris
Regnskap
Styrereferater
Årsmøter

Bli medlem!

Medlemmer
Medlemsfordeler
Nyhetsbrev
Tegn medlemskap!

Velkommen til Norecopa / 3Rs resources / Aquatic animals

Aquatic animals

This page is being used to collect links to resources concerned with aquatic animals: in particular fish, cephalopods (especially octopus, squid and cuttlefish) and decapods (especially crabs and lobsters).

3R-resources (guidelines, databases, email lists and journals) that apply to aquatic animals may be accessed here in the **3R Guide** database:

- [fish](#)
- [cephalopods](#)
- [aquatic animals in general \(other than fish\)](#)

[Severity classification of procedures used on fish](#)

[ENRICH Fish](#): a project financed by the Research Council of Norway to improve the welfare of Atlantic salmon used in laboratory experiments

[Information in Norwegian about projects in Norway concerning fish research](#)

Other literature references and links:

- Mather J (2012): Enrichment and cephalopods. [The Enrichment Record](#), July 2012, 24-28.



Foto: colourbox.com

[f](#) [t](#) [e](#) [+](#) | **Feedback**

[f](#) Følg Norecopa på Facebook

Søk...

Om Norecopa

Norecopa arbeider for å fremme "de 3 R'ene" i forskningen som kan involvere dyr:

- * **Replace**
- * **Reduce**
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norecopa



The Norwegian Reference Centre for Laboratory Animal Science & Alternatives

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Lab Animal Science

Alternatives

National Platform

Databases

NORINA

TextBase

Classic AVs

3R Guide

Other databases

Education

Requirements

Courses

Compendia

Films & slide shows

Other materials

Ethics

Fish

Meetings

Projects

Reports

Guidelines

Links

Health monitoring

Legislation

Applications

FDU

Statistics

News

Coming events

Alerting services

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Past meetings

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By Adrian Smith

This website provides information on laboratory animal science and alternatives to the use of animals in research, teaching and school dissection classes.

This website aims to be an international reference centre for Laboratory Animal Science, based on the three Rs of Russell & Burch:

- **Replace** - replace animal experiments where possible with alternatives.
- **Reduce** - reduce the number of experiments, and the number of animals in each experiment, to an absolute minimum.
- **Refine** - refine experiments that have to be carried out, so that the animals undergo the minimum of discomfort (preferably none at all), and such that the scientific quality is as high as possible.

This website was originally constructed by the Laboratory Animal Unit at The Norwegian School of Veterinary Science.

In January 2011 the responsibility for this website and its maintenance was taken over by **Norecopa**, Norway's Consensus-Platform for Replacement, Reduction and Refinement of Animal Experiments.

Norecopa aims for consensus between the four stakeholders involved in animal research: government, academia, industry and the animal welfare movement. Norecopa has its own website (www.norecopa.no), which should be read in conjunction with these pages.

This website includes 4 databases which are free of charge:

- **NORINA** (A Norwegian Inventory of Audiovisuals)
- **TextBase**
- **Classic AVs**
- **3R Guide**

NORINA contains information on over 3,500 audiovisual aids that may be used as alternatives to animals in teaching and training, including [dissection alternatives](#), at all levels from junior school to University.

TextBase contains information on over 1,400 textbooks of relevance to Laboratory Animal Science.

Classic AVs contains information on the same type of product as in NORINA, but using older technology (films, filmstrips, microslides and videodiscs).

Search

Entire website

GO!

Tip a friend Feedback Help

oslovet.norecopa.no



The Norwegian Reference Centre for Laboratory Animal Science & Alternatives

Immobilisation and Intraperitoneal Injection in the Mouse



The injection is made by sticking first subcutaneously, then moving the needle slightly forward under the skin before finally penetrating the abdominal muscles. The injection should be made to one side of the midline. Rest the third, fourth and fifth fingers of the hand holding the syringe against your wrist, to avoid unwanted movement of the needle.



Restraint



Restraint



Restraint



Restraint



Restraint



Restraint



Injection



Injection

Close this window to return
to the main menu

Slide show

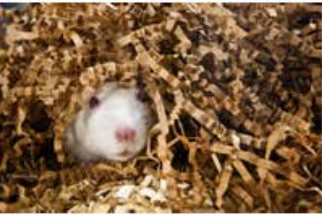
Video

European Commission

ENVIRONMENT

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

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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

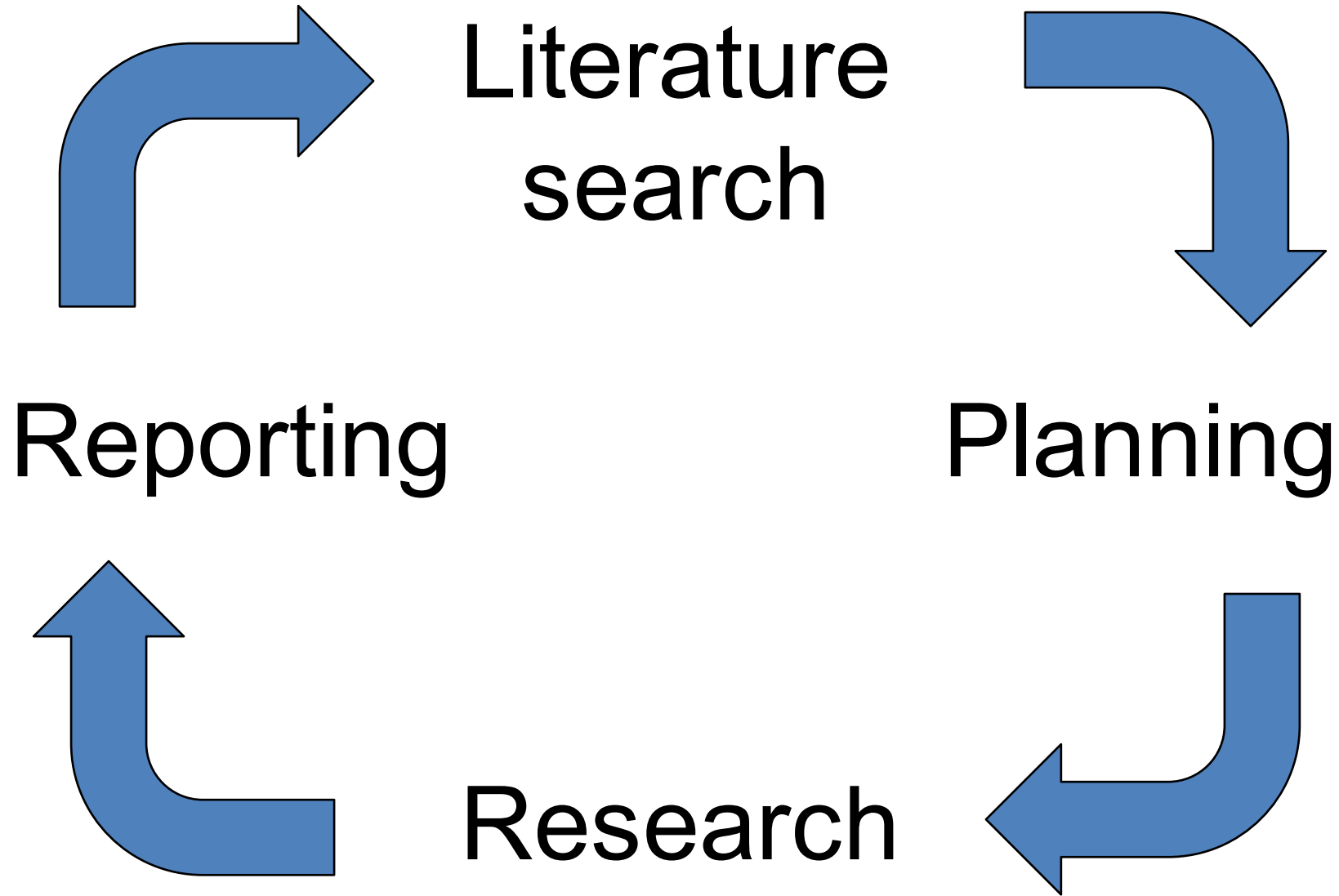
- Replacement, Reduction and Refinement – the "Three Rs"
- Validation, acceptance and use
- EU activities to advance alternatives
- Member State activities to advance alternatives
- Finding and distributing information on alternatives
- Key resources**
 - Search Tools
 - Databases
 - Portals and web-sites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

Animals used for scientific purposes



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

Teaching in Laboratory Animal Science



"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>



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.

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

Newsletter 8-9 times a year

- something for you?



Dette brevet inneholder følgende saker:

- Nå er det på tide å nominere til 3R-prisen!
- Nye nettsider for Norecopa
- Arbeidsseminar om design og statistikk
- Frist for sammendrag til FELASA
- Nettbasert kurs om sebrafisk
- 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
- 3R-fremskritt i tidsskriftet *Laboratory Animals*
- Nytenkning premieres
- Åpenhet rundt dyreforsøk
- Til ettertanke
- Fra mediene
- Møtekalenderen (oppdatert)

Du publiserer innlegg, kommenterer og liker som Norecopa — Bytt til Adrian Smith

Administrasjonspanel

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Norecopa

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norecopa

Thanks to our main sponsors:

- Norwegian Research Council
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- Laboratory Animals Ltd.
- Dag S. Stiansen Foundation
- Scottish Accreditation Board
- Nordic Society Against Painful Experiments

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