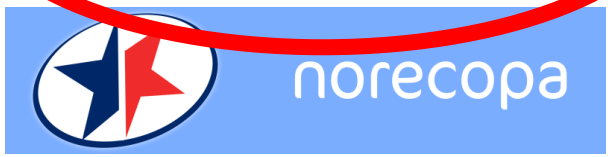
RSPCA meeting 'Focus on severe suffering'
Brussels, 16 - 17 June 2016

How to search for information on refining 'severe' models and tests

Adrian Smith

adrian.smith@norecopa.no

norecopa.no/RSPCA2016



- **Strategies for planning research which may involve animals or animal material**
- **How to search for and share 3R resources**
- **Gaps in our knowledge**
- **Action points**

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

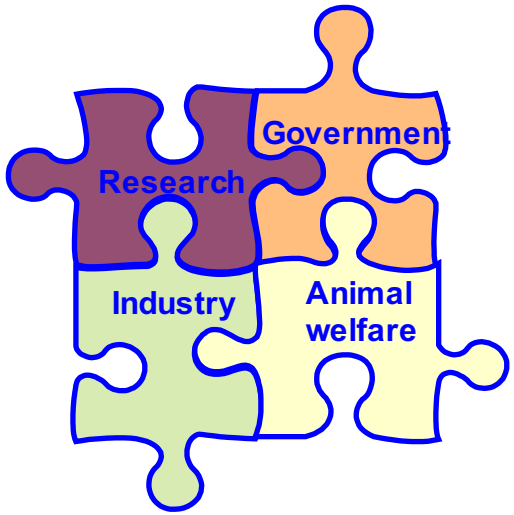
A competence centre for the 3Rs

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*

deputy: Børge N. Fredriksen, PHARMAQ

- ***Anton Krag**, Norwegian Animal Protection Alliance*

deputy: Harald Small, Norwegian Society for Protection of Animals

International consensus meetings

Harmonisation of the Care and Use of:

Fish (2005)
Wildlife (2008)
Fish (2009)
Agricultural animals (2012)
Wildlife (Autumn 2017)

http://norecopa.no/consensus-meetings

All presentations and consensus statements are on the internet: a lasting information resource on the 3Rs

ENVIRONMENT

European Commission

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

Expert Working Group report on severity classification

July 2009

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)

Abstract

Background

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More species- and situation- specific guidance is needed

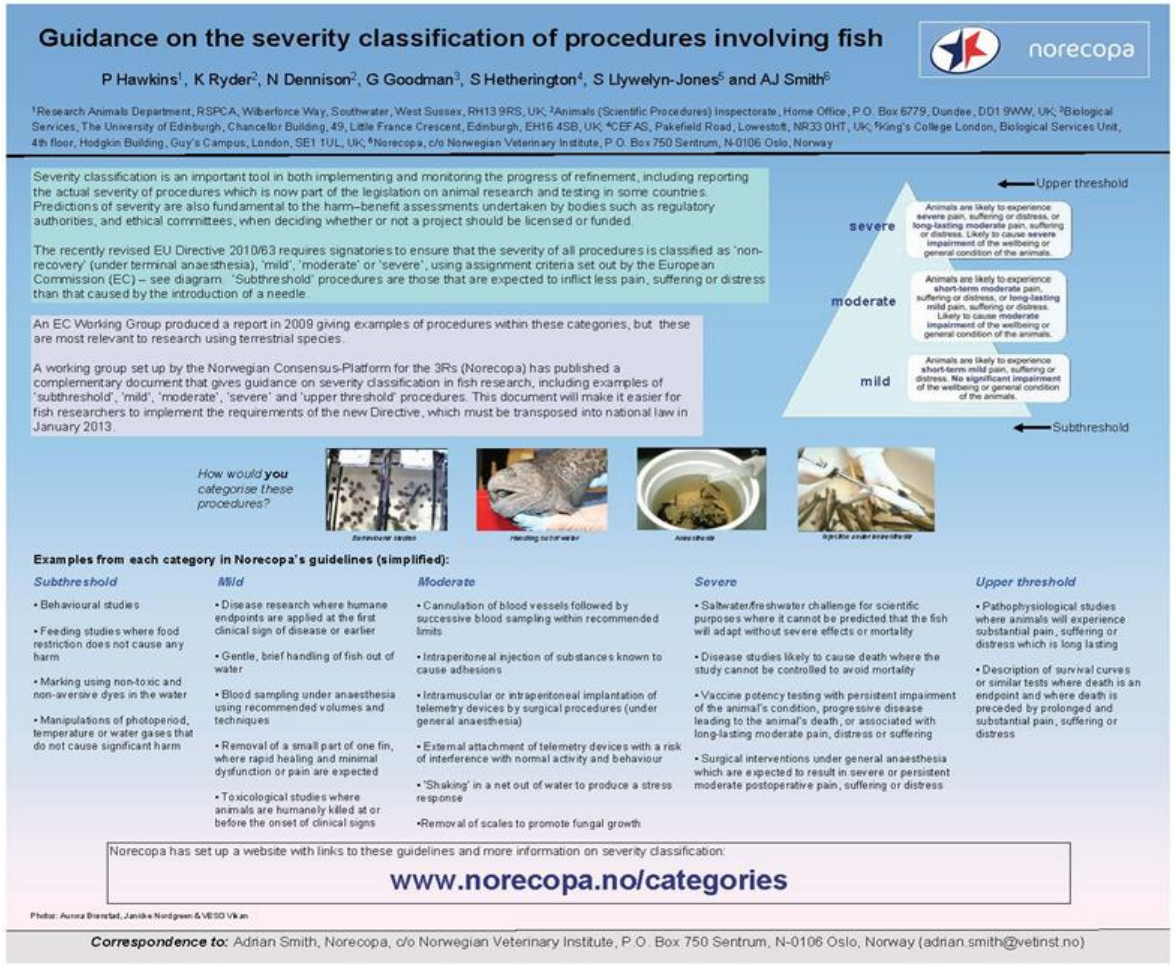
Guidance on the severity classification of procedures involving fish

Report from a Working Group
convened by Norecopa

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

Laboratory Animals, 45: 219-224, 2011

norecopa.no/categories



Guidance on the severity classification of procedures involving fish

norecopa

P Hawkins[1], K Ryder[2], N Dennison[2], G Goodman[3], S Hetherington[4], S Llywelyn-Jones[5] and AJ Smith[6]

[1]Research Animals Department, RSPCA, Wilberforce Way, Southwater, West Sussex, RH13 9RS, UK; [2]Animals (Scientific Procedures) Inspectorate, Home Office, P.O. Box 6779, Dundee, DD1 9WW, UK; [3]Biological Services, The University of Edinburgh, Chancellor Building, 49, Little France Crescent, Edinburgh, EH16 4SB, UK; [4]CEFAS, Pakefield Road, Lowestoft, NR33 0HT, UK; [5]King's College London, Biological Services Unit, 4th floor, Hodgkin Building, Guy's Campus, London, SE1 1UL, UK; [6]Norecopa, 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 2009 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*
• Behavioural studies	• Disease research where humane endpoints are applied at the first clinical sign of disease or earlier	• Cannulation of blood vessels followed by successive blood sampling within recommended limits	• Saltwater/freshwater challenge for scientific purposes where it cannot be predicted that the fish will adapt without severe effects or mortality	• Pathophysiological studies where animals will experience substantial pain, suffering or distress which is long lasting
• Feeding studies where food restriction does not cause any harm	• Gentle, brief handling of fish out of water	• Intraperitoneal injection of substances known to cause adhesions	• Disease studies likely to cause death where the study cannot be controlled to avoid mortality	• 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
• Marking using non-toxic and non-aversive dyes in the water	• Blood sampling under anaesthesia using recommended volumes and techniques	• Intramuscular or intraperitoneal implantation of telemetry devices by surgical procedures (under general anaesthesia)	• 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	
• Manipulations of photoperiod, temperature or water gases that do not cause significant harm	• Removal of a small part of one fin, where rapid healing and minimal dysfunction or pain are expected	• External attachment of telemetry devices with a risk of interference with normal activity and behaviour	• Surgical interventions under general anaesthesia which are expected to result in severe or persistent moderate postoperative pain, suffering or distress	
	• Toxicological studies where animals are humanely killed at or before the onset of clinical signs	• 'Shaking' in a net out of water to produce a stress response		
		• Removal of scales to promote fungal growth		

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

www.norecopa.no/categories

Photos: Aurora Brønstad, Janicke Nordgreen & VESO Vikan

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

Position Statements and Guidelines

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

Newsletter 8-9 times a year

- something for you?

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Hjemmeside | Tips en venn | Registrere | Avregistrere

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

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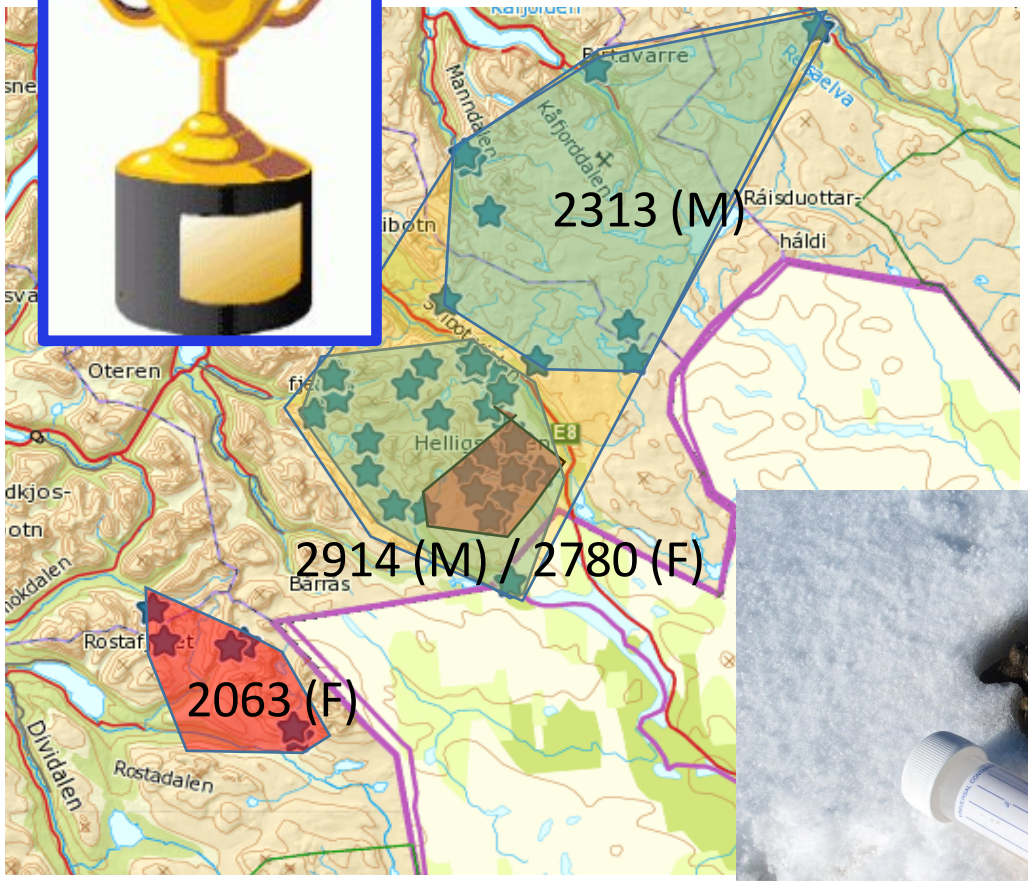


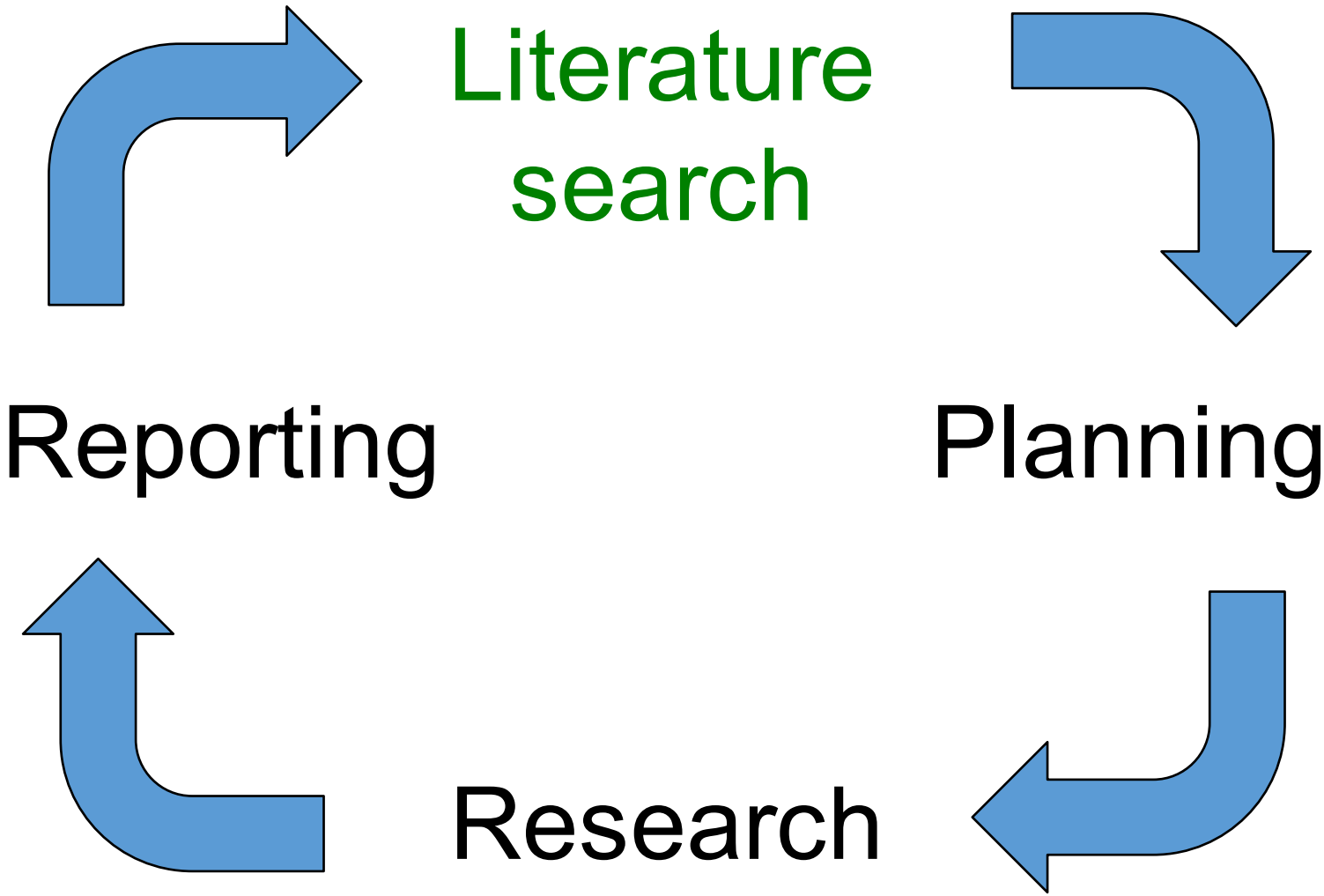
Photo: https://no.wikipedia.org/wiki/Jerv

Photo: Vegard Pedersen, Statens naturoppsyn

Øystein Flagstad

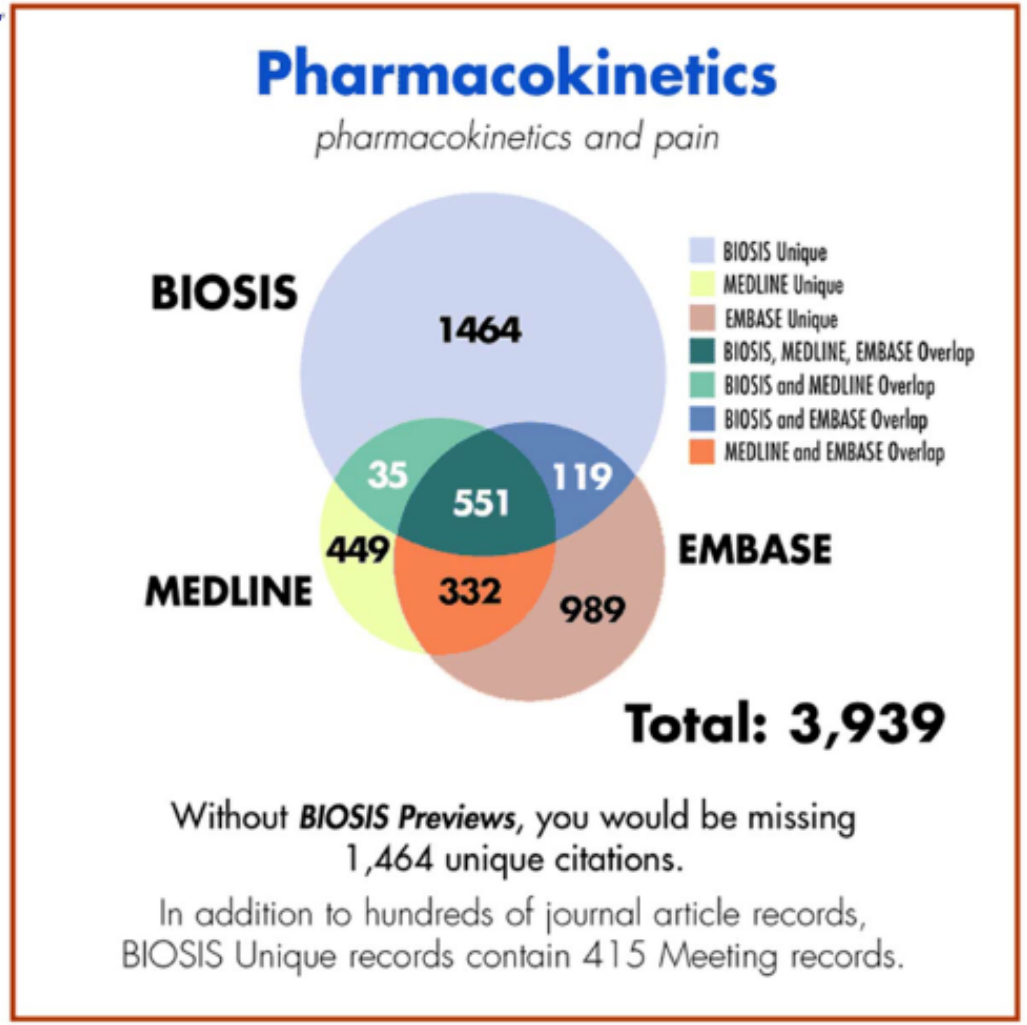
Norecopa's 3R prize

(3,000 euro + diploma)



Correct literature searches are a vital part of the work to implement the 3Rs

Why Search Multiple Databases?



Why are 3R advances to reduce severity so 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*

Things have got worse rather than better after Google arrived:

You always get some results, even if you type in everything at once.

In many ways the situation was better earlier when searches had to be done manually with the help of a librarian

Action needed:

It is high time that all scientists received mandatory education in literature searching

Scientists should ensure that 3R advances are mentioned in the title or abstract

How many of you conduct searches in PubMed / MEDLINE?

How many of you

- *formulate a specific question and then determine which elements will be your search components (SC)*
- *use Word to make a list of search terms for every SC containing*
  - *MeSH terms*
  - *synonyms*
- *perform searches with separate strings for each SC:*

  mice[MeSH] OR mice[tiab] OR mouse[tiab] OR murine[tiab]
- *finally, combine the search strings (AND)*

How many are familiar with SYRCLE's

- *Step by step guide to systematically find all relevant animal studies*
- *Search filters for finding animal studies in PubMed and EMBASE*

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

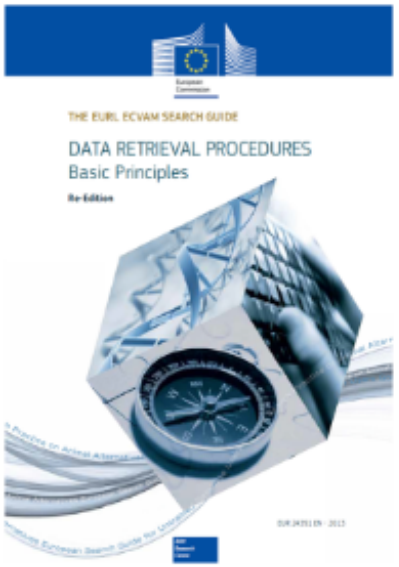
http://norecopa.no/how-to-construct-a-literature-search.pdf

Norecopa - Literature Search: Search tips

Start page for Norecopa AGM 24 May 2016

Search Guide

ECVAM Search Guide (see Download Content)



PubMed

- PubMed Practical

PubMed with incorporated animal filter (SYRCLE)

How to construct a comprehensive search strategy

- Formulate a specific research question
  In animal models for Alzheimer's Disease what is the effect of supplementation of omega-3 fatty acids on cognition and neurodegeneration?
- Determine which elements of the question will be your search components (SC)
  animals, alzheimer, omega 3 fatty acids
- Make a list of search terms** for every SC containing
  - MeSH term e.g. alzheimer disease[MeSH]
  - synonyms e.g. alzheimer, alzheimer's, alzheimers, dementia
- Create a search string for each SC using **OR** between the search terms
  Search string for component *Alzheimer* at SYRCLE website
- Perform searches with separate search strings in PubMed
- Use *History* (Advanced) to combine search strings with AND. Example

- ** Tips for turning a list of search terms into a search string (in Word)

SYRCLE

A step by step guide to systematically find all relevant animal studies

SYRCLE Tools and support for systematic reviews

SYRCLE Training materials for Systematic Review workshop

A step-by-step guide to systematically identify all relevant animal studies

Marlies Leenaars[1], Carlijn R Hooijmans[1], Nieky van Veggel[1,2], Gerben ter Riet[3], Mariska Leeflang[4], Lotty Hooft[5], Gert Jan van der Wilt[6], Alice Tillema[7] and Merel Ritskes-Hoitinga[1]

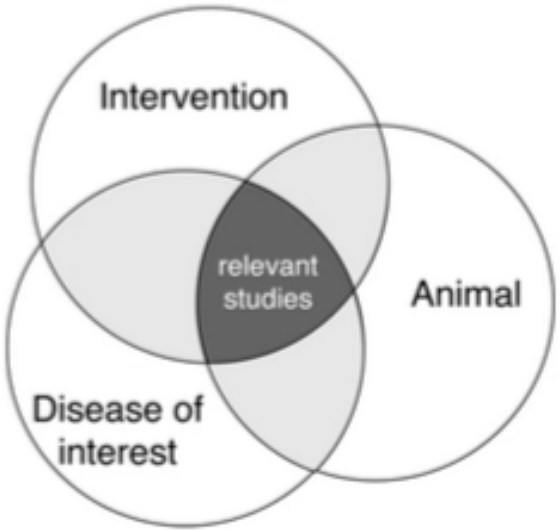


Figure 1 Combining components in the search strategy (adapted from Higgins and Green[3])

Text search filter:

("animal experimentation"[MeSH Terms] OR "models, animal"[MeSH Terms] OR "invertebrates"[MeSH Terms] OR "Animals"[Mesh:noexp] OR "animal population groups"[MeSH Terms] OR "chordata"[MeSH Terms:noexp] OR "chordata, nonvertebrate"[MeSH Terms] OR "vertebrates"[MeSH Terms:noexp] OR "amphibians"[MeSH Terms] OR "birds"[MeSH Terms] OR "fishes"[MeSH Terms] OR "reptiles"[MeSH Terms] OR "mammals"[MeSH Terms:noexp] OR "primates"[MeSH Terms:noexp] OR "artiodactyla"[MeSH Terms] OR "carnivora"[MeSH Terms] OR "cetacea"[MeSH Terms] OR "chiroptera"[MeSH Terms] OR "elephants"[MeSH Terms] OR "hyraxes"[MeSH Terms] OR "insectivora"[MeSH Terms] OR "lagomorpha"[MeSH Terms] OR "marsupialia"[MeSH Terms] OR "monotremata"[MeSH Terms] OR "perissodactyla"[MeSH Terms] OR "rodentia"[MeSH Terms] OR "scandentia"[MeSH Terms] OR "sirenia"[MeSH Terms] OR "xenarthra"[MeSH Terms] OR "haplorhini"[MeSH Terms:noexp] OR "strepsirhini"[MeSH Terms] OR "platyrrhini"[MeSH Terms] OR "tarsii"[MeSH Terms] OR "catarrhini"[MeSH Terms:noexp] OR "cercopithecidae"[MeSH Terms] OR "hylobatidae"[MeSH Terms] OR "hominidae"[MeSH Terms:noexp] OR "gorilla gorilla"[MeSH Terms] OR "pan paniscus"[MeSH Terms] OR "pan troglodytes"[MeSH Terms] OR "pongo pygmaeus"[MeSH Terms]) OR ((animals[tiab] OR animal[tiab] OR mice[Tiab] OR mus[Tiab] OR mouse[Tiab] OR murine[Tiab] OR woodmouse[tiab] OR rats[Tiab] OR rat[Tiab] OR murinae[Tiab] OR muridae[Tiab] OR cottonrat[tiab] OR cottonrats[tiab] OR hamster[tiab] OR hamsters[tiab] OR cricetinae[tiab] OR rodentia[Tiab] OR rodent[Tiab] OR rodents[Tiab] OR pigs[Tiab] OR pig[Tiab] OR swine[tiab] OR swines[tiab] OR piglets[tiab] OR piglet[tiab] OR boar[tiab] OR boars[tiab] OR "sus scrofa"[tiab] OR

...to ensure that you access recent papers also, not just the ones that have been indexed.

Relatively few papers are indexed with 3R MESH terms in MEDLINE

ec.europa.eu/animals-in-science

European Commission

ENVIRONMENT

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

Home | About us | Policies | Funding | Legal compliance | News & outreac

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.

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

Animals used for scientific purposes

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

The EURL ECVAM **Search** Guide

Can be ordered free of charge from

bookshop.europa.eu

Contents

- Data Retrieval Procedures

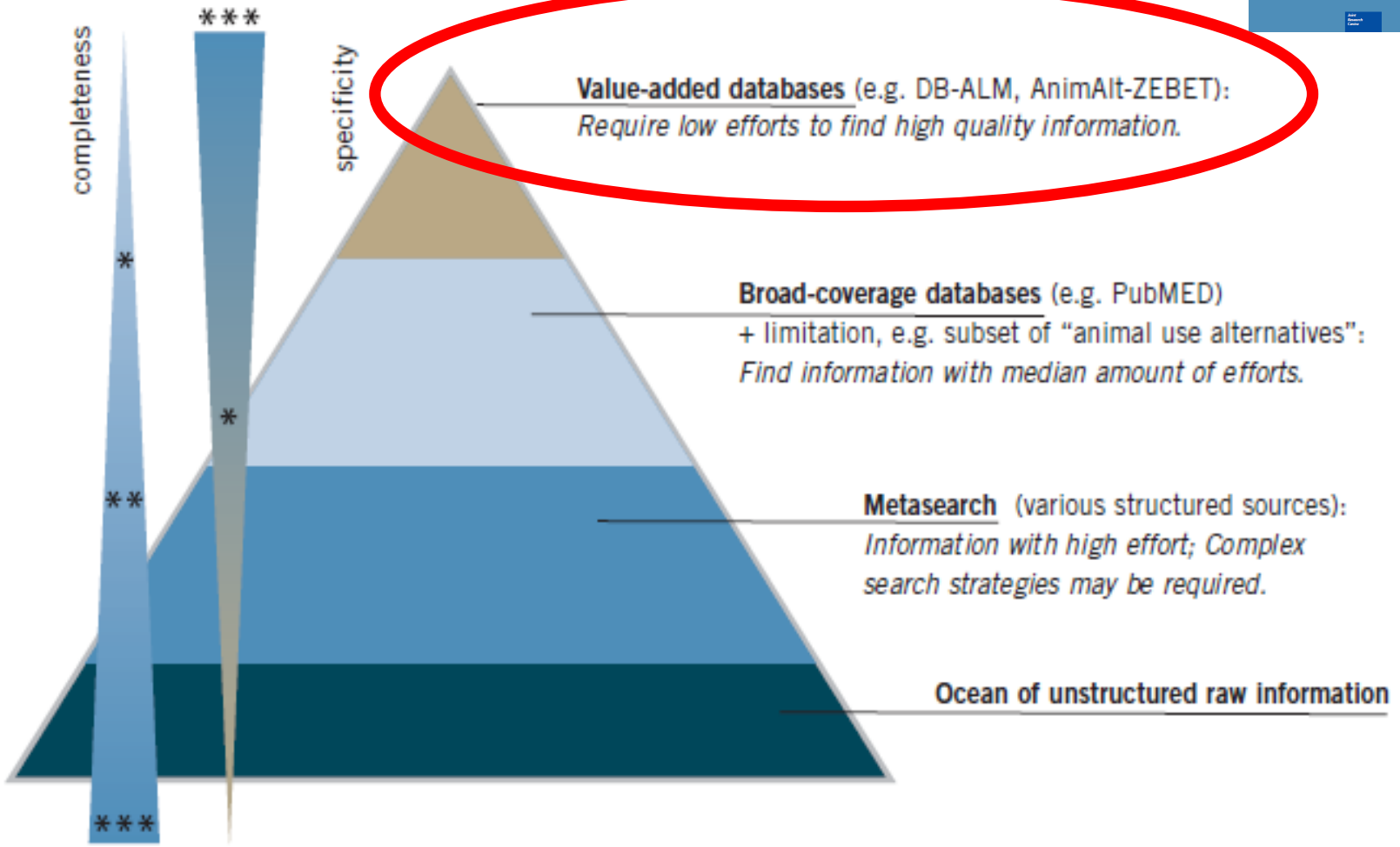
  (basic principles)
- Check-list for searching for information on alternative methods
- Tables comparing the features of
  - Databases
  - Journals
  - Organisations

Contents

Seven Golden Steps to Successful Searching

1. Clearly define and be aware of your specific information need
2. Identify the fundamental components of your scientific approach
3. Choose the most appropriate information resources
4. Compile relevant and necessary search terms
5. Start your search with a simple query in a 3Rs specific context
6. Limit search results from more extensive resources
7. Broaden the search horizon


European Commission
THE EURL ECVAM SEARCH GUIDE
GOOD SEARCH PRACTICE
on Animal Alternatives
Re-edition


completeness
specificity
***
*
**
*
***
Value-added databases (e.g. DB-ALM, AnimAlt-ZEBET):
Require low efforts to find high quality information.
Broad-coverage databases (e.g. PubMED)
+ limitation, e.g. subset of "animal use alternatives":
Find information with median amount of efforts.
Metasearch (various structured sources):
Information with high effort; Complex search strategies may be required.
Ocean of unstructured raw information


NORSK ENGLISH
norecopa
About Norecopa
Alternatives
Databases & Guidelines
Education & training
Legislation
Meetings
News
Other resources
Species
Feedback
Search all Norecopa's databases and webpages simultaneously:
Add search term
Welcome to Norecopa's new website!
Search engine help file
More about Norecopa's databases: 3R Guide - NORINA - TextBase - Classic AVs

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

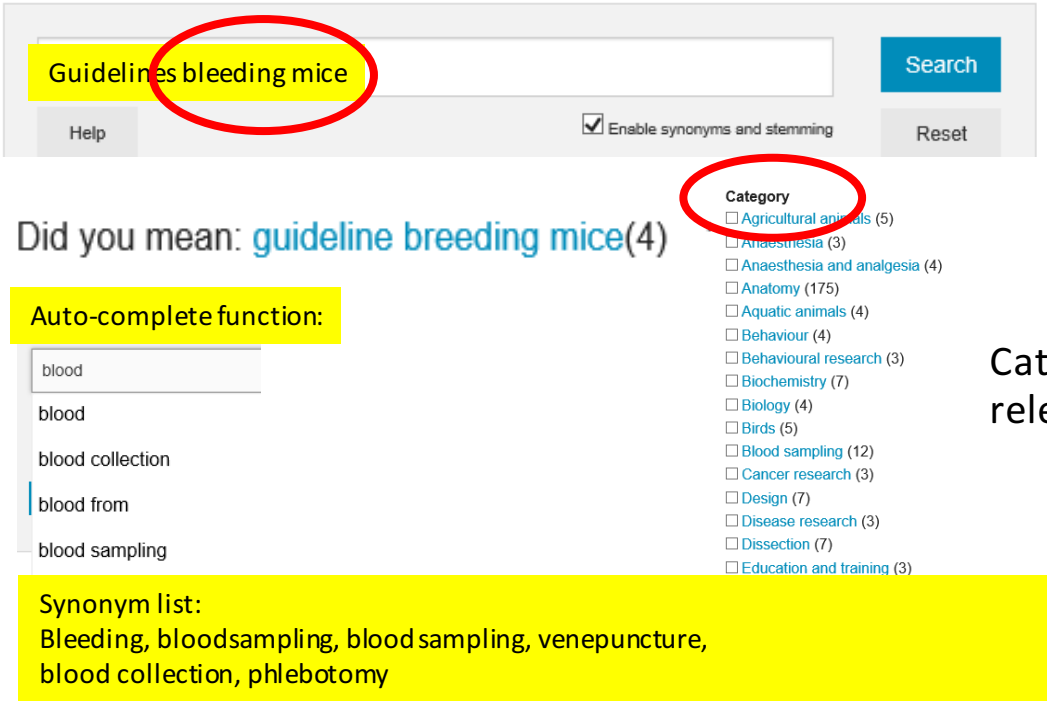
Reduce
Reduction of the number of animals used in experiments

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

The search engine



Categories, types, 3R relevance and many more

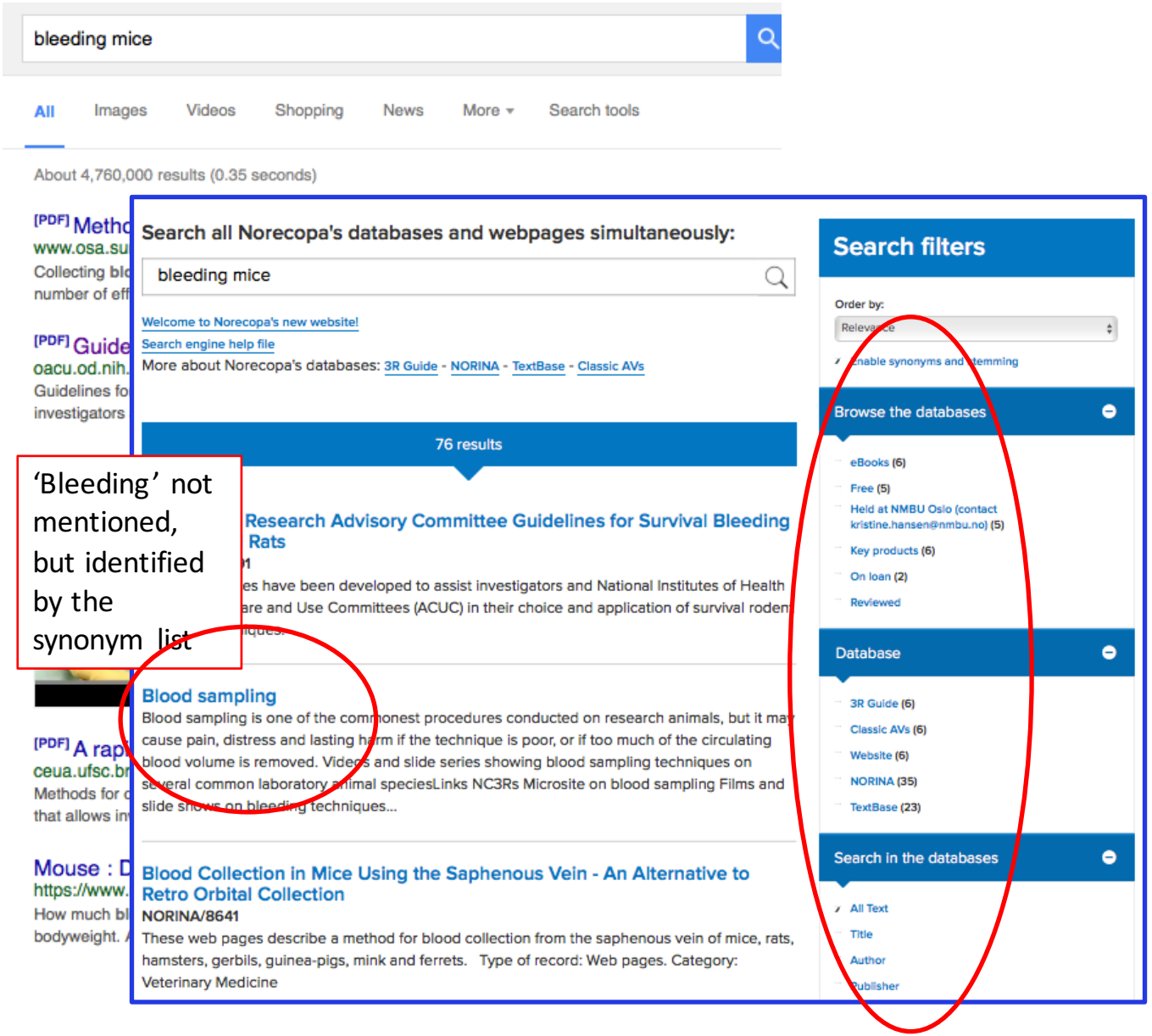
- An index of all the words on all the approx. 6,300 pages
- Fuzzy logic
- Boolean logic
- Wildcards
- Proximity searches
- Truncation

A help file available

USDA United States Department of Agriculture

Collaboration with US Department of Agriculture

Search for ‘bleeding mice’ on Google and Norecopa.



‘Bleeding’ not mentioned, but identified by the synonym list

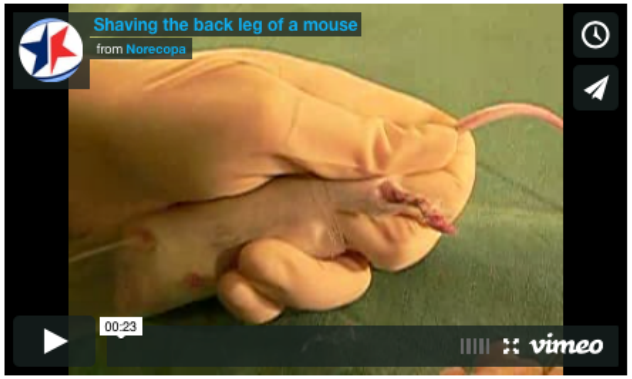
Organisations of relevance to animal research

Red links: external
Blue link: internal

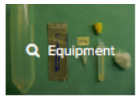
Organisations within Laboratory Animal Science

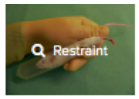
AAALAC International (Association for Assessment and Accreditation of Laboratory Animal Care International)
AALAS (American Association for Laboratory Animal Science)
ACLAM (American College of Laboratory Animal Medicine)
ASLAP (American Society of Laboratory Animal Practitioners)

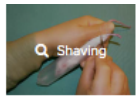

Immobilisation of the mouse using a tube
from Norecopa
00:14
vimeo


Shaving the back leg of a mouse
from Norecopa
00:23
vimeo

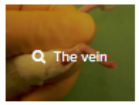

Blood collection from the saphenous vein in the mouse
from Norecopa
00:33
vimeo

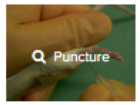

Equipment

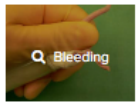

Restraint


Shaving


Shaving


The vein


Puncture


Bleeding

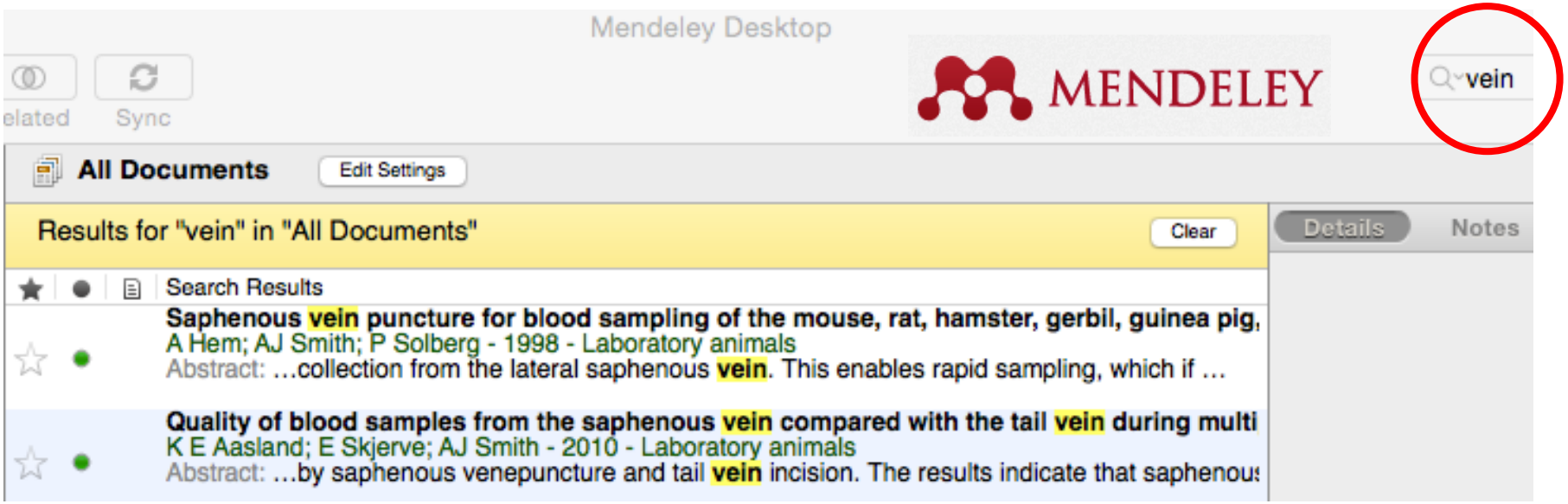

Blood collection

Archive your searches

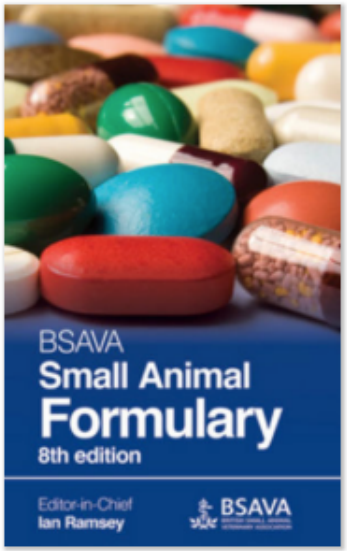
Norecopa's website generates unique URLS, so a search can be documented and repeated

http://norecopa.no/search?q=bloodsampling%20mouse

Archive key documents you retrieve, e.g. in Mendeley



Hidden 3R resources



norecopa.no / TextBase / Formulary for Laboratory Animals

Formulary for Laboratory Animals

By Terrance C. Hawk, Steven Leary & Timothy Morris

Record number: 13202 (legacy id: 6055)

This Formulary is an important reference for treatment of laboratory animals and small animal pets. Drugs are listed alphabetically and categorized in five sections based on pharmacological activities and animal species. The third edition includes a stronger international component, coverage of several new drugs, hundreds of additional dosages, and a thorough update throughout based on the most current research. It also includes a chapter describing how to estimate drug dosages among species using allometric scaling methodology. Table of Contents: Preface to the First Edition; Preface to the Second Edition; Preface to the Third Edition; Abbreviations; Formulary for Laboratory Animals: Dose Estimation Among Species; References; Analgesics and Sedatives; Anesthetics; Anti-infectives; Parasiticides; Miscellaneous Drugs; Appendixes; References; Index.

Comments & References: Third Edition. 216 pages.
Softcover. Suitable for students and practitioners of veterinary medicine, researchers and laboratory technicians who prescribe or administer drugs used on common laboratory animals. The second edition of this book is also available as a CD-ROM for both PC and Macintosh. Please see record number 5331 for the CD-ROM version in the NORINA database, entitled Formulary for Laboratory Animals CD-ROM. A review of the Third Edition is available in Laboratory Animals, October 2005, Volume 39 (4) or at http://la.rsmjournals.com/archive.

ISBN-10: 0-8138-1048-5; **ISBN-13**: 978-0-8138-1048-5

Chapter on **Dose estimation among species** by Timothy H. Morris

A simple summary would be that since time parameters are related to weight to the power of about 0.25, and volumes are related linearly to the power of about 1.0, volume-rates (volume divided by time, e.g., cardiac output) must be related to weight to the power of about 0.75 (see Lindstedt and Calder, 1981, equation 7):

$$\frac{\text{Volume}}{\text{Time}} \propto \frac{M^{1.0}}{M^{0.25}} = M\,0.75$$

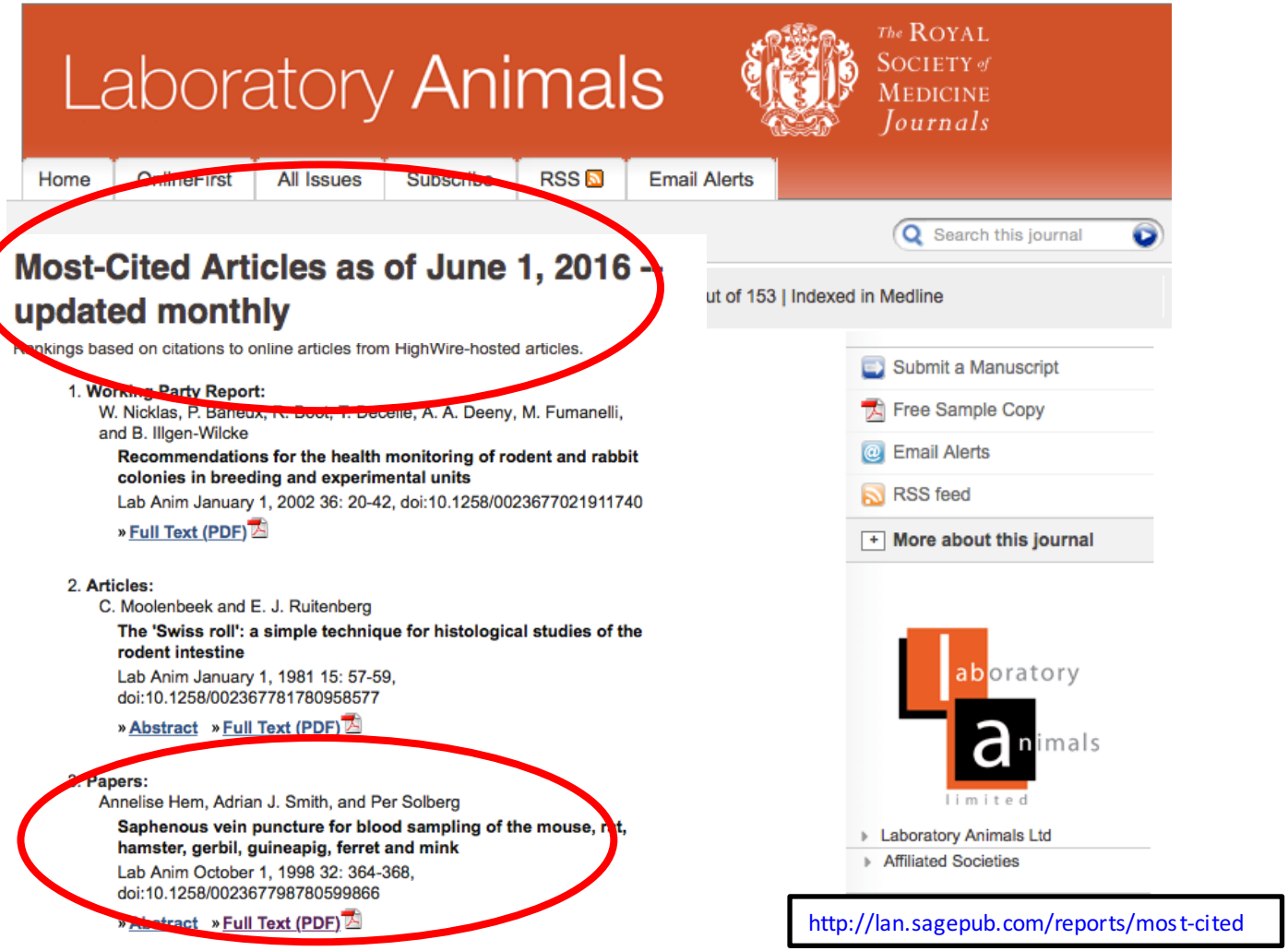
It will take a lot longer to find refinements for severe models and tests as long as scientists hide their refinements in the Materials and Methods section!

http://www.theodora.com/rodent_laboratory/blood_collection.html

photo: NMBU

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

Saphenous vein puncture for blood sampling of the mouse, rat, hamster, gerbil, guinea-pig, ferret and mink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1. Working Party Report:
W. Nicklas, P. Baneux, R. Boot, T. Decelle, A. A. Deeny, M. Fumanelli, and B. Illgen-Wilcke
Recommendations for the health monitoring of rodent and rabbit colonies in breeding and experimental units
Lab Anim January 1, 2002 36: 20-42, doi:10.1258/0023677021911740
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2. Articles:
C. Moolenbeek and E. J. Ruitenberg
The 'Swiss roll': a simple technique for histological studies of the rodent intestine
Lab Anim January 1, 1981 15: 57-59, doi:10.1258/002367781780958577
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3. Papers:
Annelise Hem, Adrian J. Smith, and Per Solberg
Saphenous vein puncture for blood sampling of the mouse, rat, hamster, gerbil, guineapig, ferret and mink
Lab Anim October 1, 1998 32: 364-368, doi:10.1258/002367798780599866
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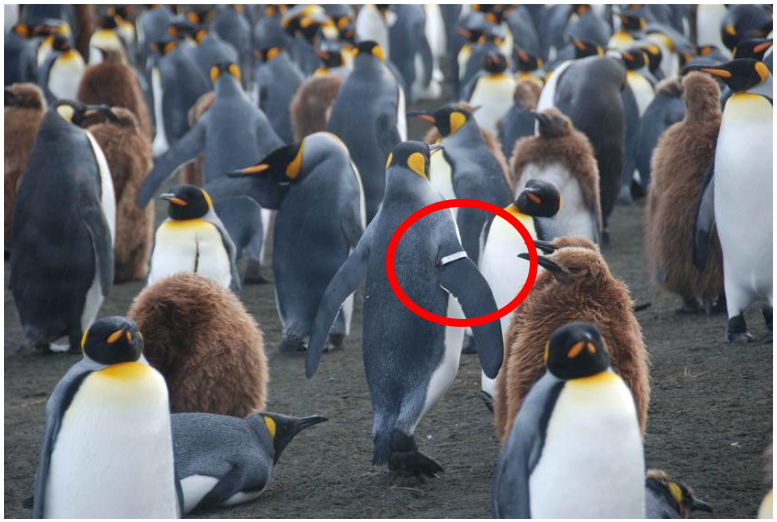
”Simple” capture and identification methods? Do they affect the animal?

Photo: T. Poppe, NMBU

colourbox.com



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

”Simple” techniques?

Photo: NMBU

Are they feasible?
For example, intramuscular injections

Risk of perforation of the oesophagus

A 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.

Critical anthropomorphism:
= *empathy* + objective, knowledge-based consideration of what is likely to be significant to the animal

Smith AJ & Hawkins P (submitted) The Three S's of Carol Newton

photos: NMBU

photo: NMBU

Murphy's Law:

Critical situations leading to severe suffering occur when they are fewest experienced staff on duty and when the scientists are least accessible (public holidays).

Who gets to do what?

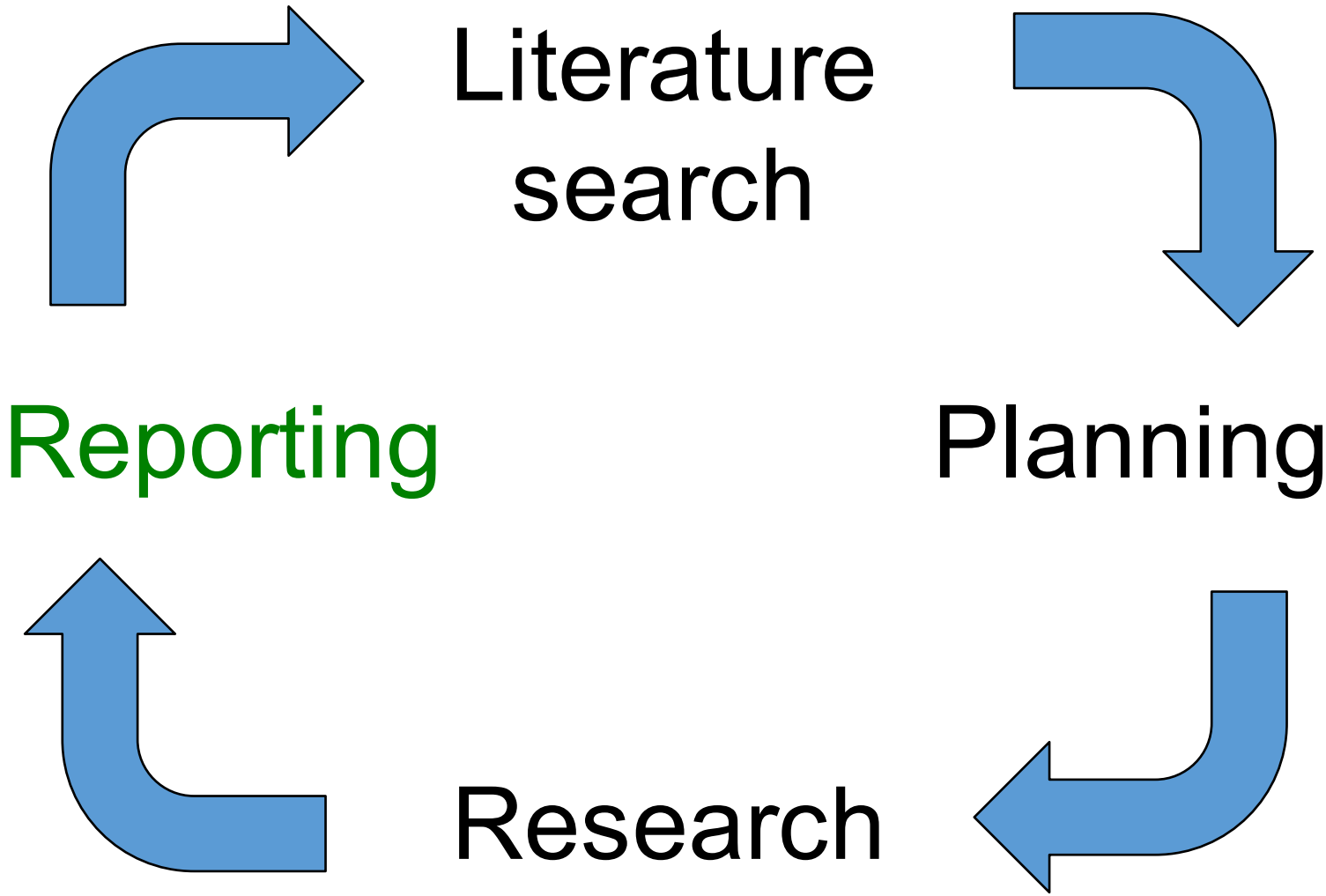
Is it acceptable to give scientists a key to the lab and a room full of mice?

Suffering can occur at all stages

- Breeding
- Weaning
- Transport
- Acclimation
- Re-grouping before the experiment
- Procedures, e.g. choice of
  - dose
  - method of administration
  - methods of data collection (blood sampling, body temperature, heart rate, blood pressure etc.)
- Pilot studies
- The main study
- "Humane" killing
- Re-homing

Consult the technicians from Day 1 when the scientist first visits the facility:

- so they hear all the reasons for the project and its wider relevance to society
- so they don't hear rumours (fear of chemicals, micro-organisms and animal harm)
- they know the possibilities (and limitations) in the animal facility
- they often possess a large range of practical skills and are good at lateral thinking
- they know the animals best
- the animals know them best
- motivated technicians provide the best and most creative service



Honest reporting of failures and cases of suffering is essential if we are to make progress (upwards spiral)

Position Statements from the regulatory authorities

FORSØKSDYRUTVALGET

- Hjem
- Arkiv
- Om forsøksdyrutvalget
- Regelverk
- **Prinsippavgjørelser**
- For søkere
- Kurs og kompetansekrav
- Ofte stilte spørsmål
- Alternativ til forsøk med dyr
- Lenker
- Møtevirksomhet
- Kontakt oss

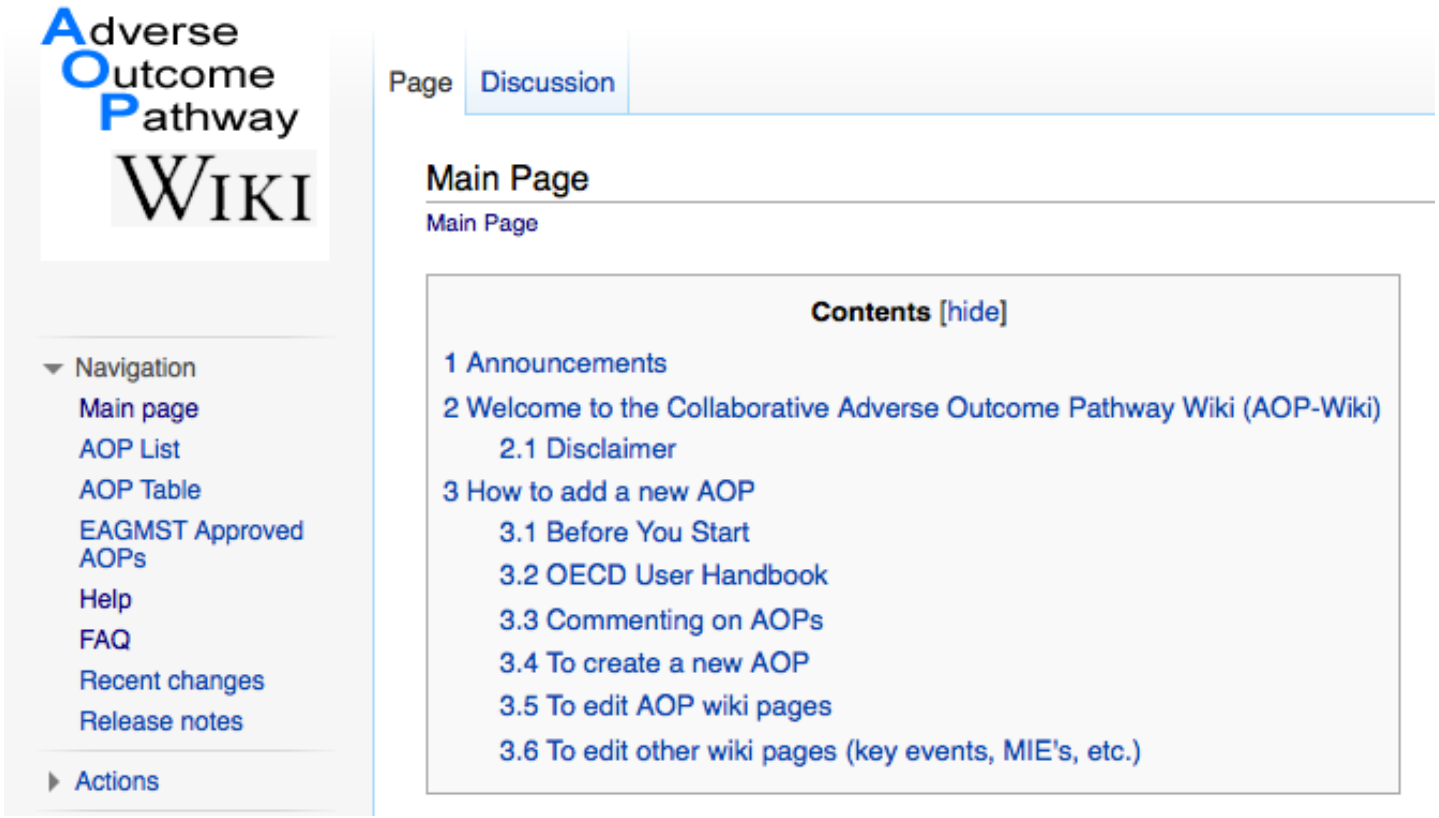
[03.07.14] Prinsipputtalelse om bruk av telemetri
[03.07.14] Prinsipputtalelse om bruk av telemetri-halsbånd på hjortevilt og rovvilt
[25.10.13] Søknadsplikt ved blodprøvetaking av viltlevende fugler
[03.09.13] Prinsipputtalelse: Merking av viltlevende fugler
[29.11.12] Prinsipputtalelse om blokksøknader
[23.10.12] Merkemetoder på fisk i laboratorieforsøk
[28.09.11] Krav til avdelinger som ønsker å bli godkjente forsøksdyrvirksomheter
[18.03.11] Retningslinjer for behandling av søknader om forsøk med lakselus
[23.02.11] Belastende forsøk med smågnagere
[27.10.10] Alle søknader som involverer lakselus skal inntil videre behandles av FDU
[03.04.09] Smitteforsøk og smertevoldende forsøk på fisk
[21.01.08] Bruk av Nevromusklære blokkere til Forsøksdyr
[14.11.06] Forsøksdyr med ein avvikande fenotype (genmodifiserte dyr, mutanter og innavla linjer)
[24.05.06] Utviklingsstadium for fiskelarver som omfattes av regelverk for forsøksdyr.
[02.06.04] Avliving av gnagere med CO_2
[02.06.04] Giftighetstesting på fisk i petroleumsvirksomheten
[26.08.03] Utfasing av LD50 - akutt giftighets testing
[21.07.03] Forsøk med dyr for å illustrere kjent kunnskap (inkl. undervisning)
[21.07.03] Oppstalling av smågnagere i metabolismebur
[21.07.03] Veiledning for beredskapsvakt utenom ordinær arbeidstid ved Forsøksdyravdelinger
[11.12.02] Bruk av eter til bedøvelse
[11.12.02] Forsøksdyrutvalgets policy ved smertevoldende dyreforsøk
[03.07.02] Bruk av intraperitoneale radiosendere
[10.05.02] Produksjon av monoklonale antistoffer (MAbs)
[10.05.02] Avlivningsmetoder for nyfødte smågnagere

Listserves: email discussion lists

- can be useful for firefighting
- often excellent replies (own experience, names of colleagues, literature references)
- rarely possible to access an archive

A possible solution: a Wiki on Refinement (Susanna Louhimies)

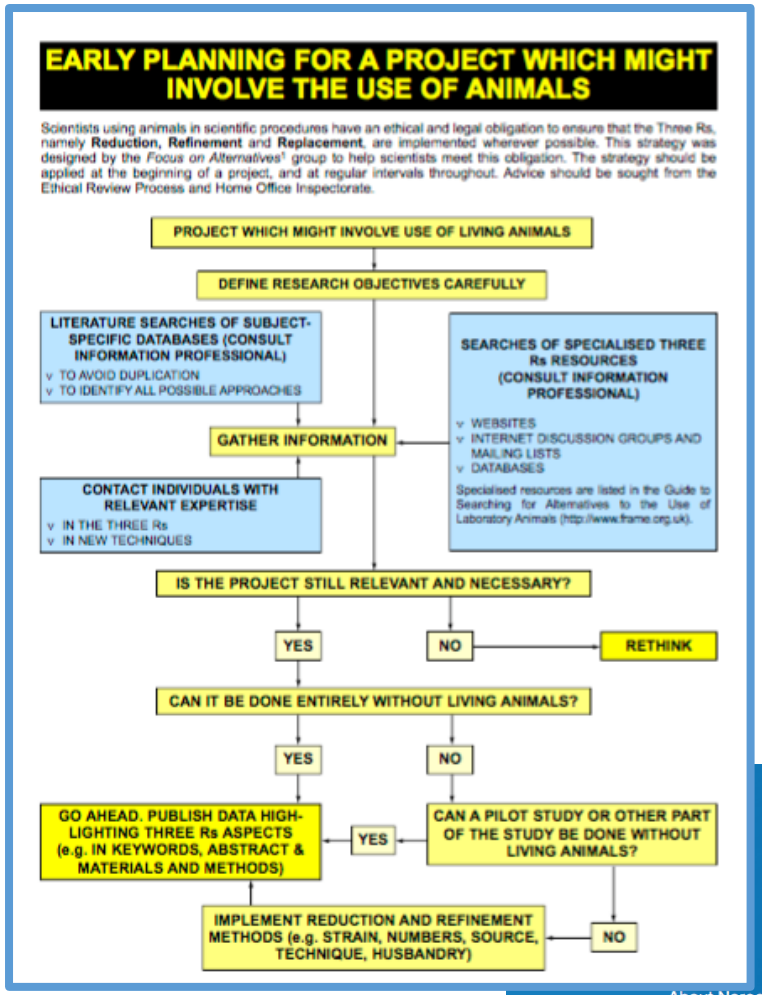
like this:



https://aopwiki.org

A system for pre-peer review:

https://www.peerageofscience.org



Design and statistical analysis of animal experiments

Search strategies in a nutshell

colourbox.com

- Define the search as well as possible
- Identify synonyms and 3R terms
- Remember the differences between British & American English
- Use several databases (little overlapping)
- Learn the differences between the search engines (read the instructions!)
- Get used to using Boolean logic and check which terms are supported by the search engine
- Learn how to expand/narrow your search
- Look for core articles and key authors
- Use the possibilities on the Internet to get in touch with the best research labs

norecopa.no/website-poster

Norecopa, Norway's 3R centre: norecopa.no

USDA Animal Welfare Information Center
awic.nal.usda.gov

norecopa.no: a global overview of quality resources within laboratory animal science and welfare

Adrian Smith[1], Karina Smith[1], Øyvind Wærenskjold[2] & Tim Allen[3]
[1]Norecopa, P.O. Box 750 Sentrum, 0106 Oslo, Norway; [2]Bitfarm, Vigeveien 15A, 4639 Kristiansand, Norway; [3]Animal Welfare Information Center, National Agricultural Library, 10301 Baltimore Avenue, Beltsville, Maryland 20705, USA

Quality resources in Laboratory Animal Science: where do I find them?

Increased focus on **the 3Rs** *(Replacement, Reduction & Refinement)* in Laboratory Animal Science and regulatory demands mean that scientists, committee members and animal house staff need easy access to relevant resources.

Norecopa has built a brand-new website and intelligent search engine which provide a global overview of selected quality resources. The site consists of three major databases and approx. 500 webpages.

✔ ***The search engine returns hits from all these resources simultaneously. A large range of filters can be applied to narrow the list of hits. All searches generate unique web addresses (URLs), making it easy to document the searches which have been performed.***

***3R Guide* database and webpages**

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

Audiovisual products
NORINA

Textbooks
TextBase

Please contact Adrian Smith (adrian.smith@norecopa.no) for more information.

We gratefully acknowledge the financial support of Dag Stiansen's Foundation, Laboratory Animals Ltd., the Nordic Society against Painful Animal Experiments, Novo Nordisk, the Scottish Accreditation Board and the US Department of Agriculture.

Graphics: colourbox.com

Our vision:
To aid dissemination of 3R resources between the different scientific fields

https://kmonadollaraday.files.wordpress.com/2011/03/information-silos.jpg

http://www.london-gifts.co.uk

There are lots of platforms...

...but are there enough trains?

Norecopa aims to be a fast train to global 3R resources

Photo: http://www.bbc.com/news/uk-england-london-35882068

norecopa

Thanks to our main sponsors:

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

Dag S. Stiansens Stiftelse

Action points

- Encourage **mandatory training in literature searching** for all scientists planning or conducting research which may involve animals or animal material
- Promote a **Culture of Communication**:
  - Persuade scientists to mention 3R advances in the title or abstract of their papers, so they get indexed by MEDLINE – or publish them as separate M&M papers
  - Lobby industry to publish more preclinical data on drug doses (especially on analgesics) for all species, age groups and both sexes
  - Encourage local regulatory authorities to publish their own policy statements and recommendations, which are as detailed as possible and which cover the areas of greatest risk in their country/state
  - Produce more species- and situation-specific guidelines on the use of newer models (zebrafish, cephalopods, decapods) and new technology. Nothing is too trivial!
  - Build a Refinement Wiki – and in the meantime expand existing websites