

# A Refinement Wiki

[\*norecopa.no/WC11-wiki\*](https://norecopa.no/WC11-wiki)

Adrian Smith

[\*adrian.smith@norecopa.no\*](mailto:adrian.smith@norecopa.no)



norecopa

[\*https://norecopa.no\*](https://norecopa.no)

Norecopa: PREPARE for better Science

## Acknowledgements

All those who have collaborated with Norecopa in the process of launching the Wiki, writing the instruction manual and contributing the initial material:

*Aurora Brønstad*

*Boris Jerchow*

*Elliot Lilley*

*Geoff Hale*

*Katharina Hohlbaum*

*Lucy Whitfield*

*Ngairé Dennison*

*Pascal Van Loo*

*Paulin Jirkof*

*Sabine Bischoff*

*Viola Galligioni*

*Øyvind Wærenskjold*

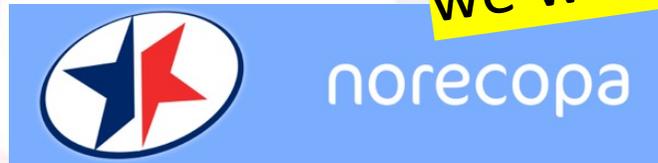
And not least to Mark d'Alton who collated discussions on the VOLE forum so that they could be added to the Wiki.

*but the responsibility for this presentation is mine alone*

# Norecopa

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

we welcome more from you!



<https://norecopa.no>

Norecopa: PREPARE for better Science

## norecopa.no : an updated overview of global 3R resources



The screenshot shows the norecopa.no website interface. At the top, there is a blue header with the norecopa logo (a stylized star) and the text "norecopa". Below the header is a navigation menu with links: "About Norecopa", "Alternatives", "Databases & Guidelines", "Education & training", "Legislation", "Meetings", "More resources", "News", and "PREPARE".

Below the navigation menu, there is a list of resource categories: "Anaesthesia and analgesia", "Animal facilities", "Animal welfare organisations", "Blood sampling", "Culture", "Email discussion lists", "Environmental enrichment", "Ethics", "Experimental design and reporting", "Harm-...", "Health and safety", "Health monitoring", "Humane...", "Literature searches and systematic reviews", and "Organi...".

Below the categories, there is a breadcrumb trail: "norecopa.no / More resources / Experimental design".

Below the breadcrumb trail, there is a large heading: "Design and reporting of animal experiments".

Below the heading, there is a paragraph: "This page supplements advice given in [Section 4 of the PREPARE guidelines](#). PREPARE covers all aspects of design (including animal and facility related issues)."

At the bottom, there is a footer: "Norecopa: PREPARE for better Science".

On the right side of the screenshot, there is a "Search filters" sidebar. It includes:

- Search filters**
- Order by:** A dropdown menu with "Relevance" selected.
- Typo tolerance:** A dropdown menu with "Default" selected.
- Database** (expanded): A list of databases with their respective hit counts:
  - 3R Guide database (403)
  - Classic AVs database (118)
  - European Commission Inventory of 3Rs Education & Training Resources (567)
  - European Commission Inventory of 3Rs Knowledge Sources (807)
  - European Commission Inventory of NAMs for Respiratory tract diseases (280)
  - NAL records (1688)
  - NORINA database (3141)
  - TextBase database (1501)
  - Website (761)
- Browse the databases** (expanded): A list of database categories with their respective hit counts:
  - eBooks (286)
  - Free (199)
  - Held at NMBU Oslo (contact Kristine Hansen, 67 23 21 89) (431)
  - Key products (68)
  - On loan (6)
  - Reviewed (85)
- Search in the databases** (expanded): A list of search criteria:
  - All Text
  - Title
  - Author
  - Publisher
  - Supplier
  - Record Number

approx. 9,000 webpages  
300,000 hits annually

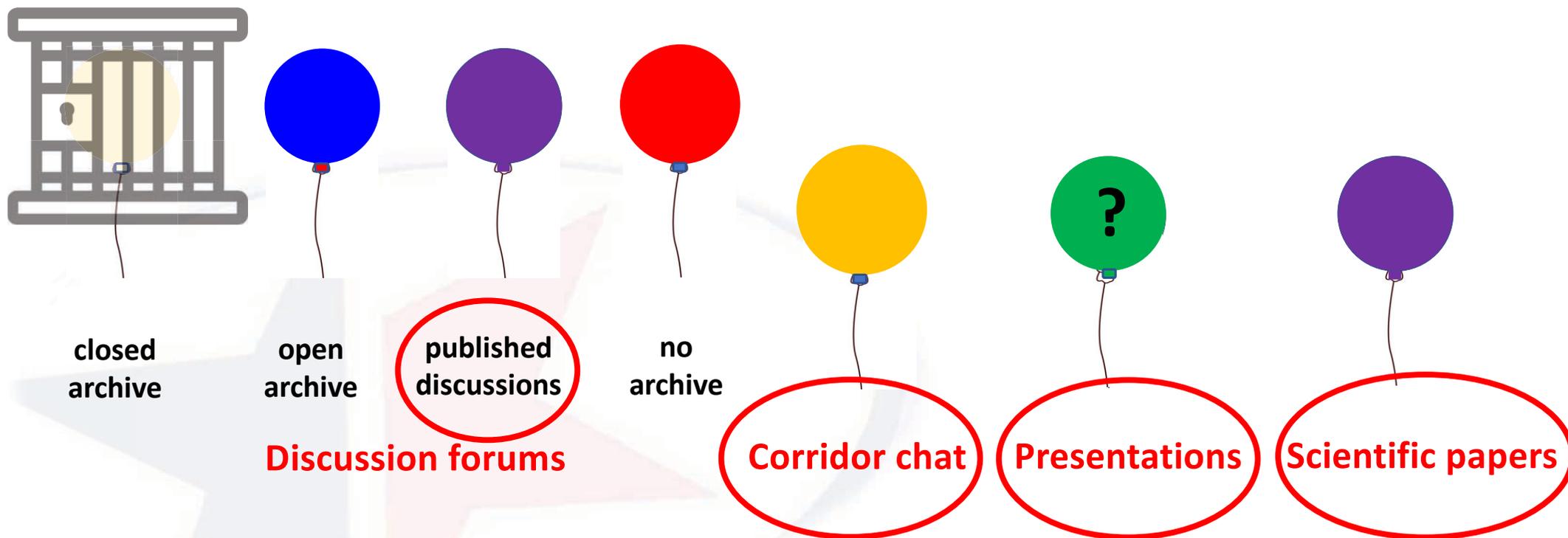
7-8 detailed newsletters per year

## Design and reporting of animal experiments

This page supplements advice given in [Section 4 of the PREPARE guidelines](#). PREPARE covers all aspects of design (including animal and facility related issues).

Norecopa: PREPARE for better Science

# The Waste of Good Ideas...





## *3R literature can be hard to find...*

[norecopa.no/more-resources/literature-searches-and-systematic-reviews](http://norecopa.no/more-resources/literature-searches-and-systematic-reviews)

- We need to search in several databases (poor overlapping between them)
- Few scientists are aware of the specialist 3R-databases
- Scientists rarely use "3R" words when they write titles/abstracts/keywords for their papers
- We have no one "Journal of all the Three Rs"
- ***A lot of good 3R ideas are never published...***

## wiki.norecopa.no

### The Refinement Wiki

Born from the knowledge that a lot of good ideas on refinement circulate on discussion forums, but never get published.



Designed to be

- a portal for rapid publication and dissemination of these ideas
- a place to identify experts on specific refinement techniques
- an aid to finding collaborators for multi-lab studies on refinement

Launched as covid-19 lockdown started... ☹️

# Refinement Wiki



- Main page
- Recent changes
- Random page
- Help about MediaWiki
- Tools
- What links here
- Related changes
- Upload file
- Special pages
- Printable version
- Permanent link
- Page information
- Cite this page

wiki.norecopa.no



AS191219 Talk Preferences Watchlist Contributions Log out

Page Discussion Read Edit Edit source View history More Search Norecopa Wiki

## Clicker training

Clicker training is an operant conditioning based on positive reinforcement. When the animal offers the desired behavior, a *click* or another distinctive sound (secondary reinforcer) is delivered and within the following few seconds the reward is presented (primary reinforcer)<sup>[1]</sup>. The *click* bridges the time between the desired behavior and the presentation of the reward<sup>[1]</sup>. A target stick providing a visual guide for the animal can be used for the training.

Animals are usually trained individually, though it is also possible to perform clicker training in a groups, e.g. in mice, rats, and rabbits. For rats, it was demonstrated that they learned tasks by observing the clicker training of their cage mates<sup>[2]</sup>.

Clicker training can be used to train animals in a stress-free way. The following behaviours are examples for what this technique can be used for:

**Mice:** entering a tunnel, following a target stick, climbing on the palm of the hand<sup>[3]</sup>

**Rats:** following a target stick, voluntarily change to a cage, observational learning<sup>[2]</sup>

**Rabbits:** following a target stick, rearing/standing up to inspect the abdomen, approaching a human, being touched and lifted by a human, trimming nails, coming on command

**Pigs:** Pigs can be easily trained to cooperate if they are treated empathetically and desired behavior is reinforced by providing food stuff in form of treats and apple juice<sup>[4]</sup>.



**Clicker training with mice using a target stick.** *Left:* The mouse is following the target stick and is climbing on the experimenter's hand. If the hand is lifted, the mouse will remain on the palm of the hand. *Right:* The mice are trained in a group. Two mice are following the target stick on the palm of the experimenter's hand.

- <sup>1</sup> <sup>1.0</sup> <sup>1.1</sup> Feng, Lynna C.; Howell, Tiffani J.; Bennett, Pauleen C. (1 August 2016). "How clicker training works: Comparing Reinforcing, Marking, and Bridging Hypotheses". *Applied Animal Behaviour Science*. **181**: 34–40. doi:10.1016/j.applanim.2016.05.012. ISSN 0168-1591.
- <sup>2</sup> <sup>2.0</sup> <sup>2.1</sup> Leidinger, Charlotte Sophie; Kaiser, Nadine; Baumgart, Nadine; Baumgart, Jan (25 October 2018). "Using Clicker Training and Social Observation to Teach Rats to Voluntarily Change Cages". *JoVE (Journal of Visualized Experiments)* (140): e58511. doi:10.3791/58511. ISSN 1940-087X. PMC 6235608. PMID 30417890.
- <sup>3</sup> Leidinger, Charlotte; Herrmann, Felix; Thöne-Reineke, Christa; Baumgart, Nadine; Baumgart, Jan (6 March 2017). "Introducing Clicker Training as a Cognitive Enrichment for Laboratory Mice". *JoVE (Journal of Visualized Experiments)* (121): e55415. doi:10.3791/55415. ISSN 1940-087X. PMC 5408971. PMID 28287586.
- <sup>4</sup> "Positive Reinforcement Training in Large Experimental Animals" (PDF).

**Experts for clicker training in mice and rats:** TARC, Mainz, Germany

This page was created and edited by KH191219 (talk).

This page was last edited on 27 May 2020, at 11:23.

Privacy policy About Norecopa Wiki Disclaimers



Norecopa: PREPARE for better Science

[wiki.norecopa.no](http://wiki.norecopa.no)



## ***Can we trust its contents?***

**The content of the Wiki is NOT curated by Norecopa's staff** - responsibility for content lies with the registered users who have contributed to it

Comments about the content of a page can be left on the page's Discussion tab  
Comments to a contributor can be left on the their Talk page

It is up to the contributor to describe the evidence base for the refinement.  
If the refinement has been published, the reference should be given

If it has only been presented at a scientific meeting, or is a preliminary or observational finding, the contributor's username should be added

## Pages created (July 2021)

[wiki.norecopa.no](http://wiki.norecopa.no)



- Acclimatisation
- Adrian Smith
- Alphaxalone
- Anaesthesia in neonates
- Analgesia
- Asepsis
- Blood sampling of hamsters
- Blood sampling of pigs
- Blood sampling of rainbow trout
- Breeding strategies for mice
- Clicker training
- Contingency plans
- Decapitation
- Detecting early onset of clinical signs in the mouse model of Covid-19
- Detection of pain and distress in mice
- EMLA cream
- Embryo transfer
- Experimental Autoimmune Encephalomyelitis (EAE)
- Facial expression analysis
- Food crunchers
- General discussion on use of analgesics
- Genotyping mice
- Habituation training
- High-fat diets
- Hot Bead Sterilisers
- Housing nude mice
- Housing research fish
- Humane endpoints
- Hydrodynamic gene delivery
- Intra-ocular injections
- Intranasal administration
- Intraperitoneal injection
- Intraperitoneal pentobarbitone
- Ketamine and alpha-2 agonist combinations
- Long-term anaesthesia in rodents
- Lumpfish
- Main Page
- Marble Burying Test
- Metabolic cages
- Minipumps
- Montanide adjuvant
- Mouse Grimace Scale
- Mouse handling
- Nest building material
- Oestrus suppression in ferrets
- Pneumocystis murina
- Recapping needles
- Rotarod Test
- Screening cell lines
- Sedation of cattle
- Splenectomy
- Sterilisation of instruments
- TTEAM and TTouch
- Tail vein injection
- Tramadol
- Transport stress
- Tumour cell implant into mammary fat pad
- Ulcerative Dermatitis in Mice
- Water quality
- Xenopus laevis
- Zebrafish swabbing

wiki.norecopa.no



The Wiki is an integral part of Norecopa's website: [norecopa.no](https://wiki.norecopa.no)

So all Wiki content is retrievable from Norecopa's search engine

In addition, the Wiki has its own internal search engine

We have written a simple instruction manual to keep the threshold for adding new content as low as possible



## Acknowledgements

The idea of creating a Refinement Wiki came from Susanna Louhimies, whom we thank for her encouragement and valuable comments at all stages of this process

A donation from the Norwegian Animal Protection Alliance's Research Fund financed installation of the software



The Norwegian Animal Protection Alliance's Research Fund

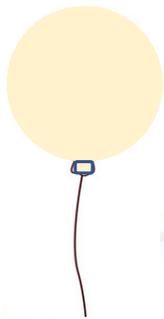


Dyrevernalliansen

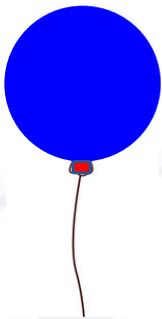
# The Fate of Good Ideas...

Enthusiasm for the Wiki 

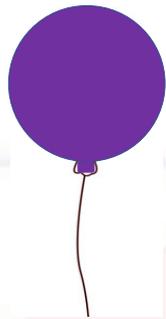
Submission of material... 



closed  
archive



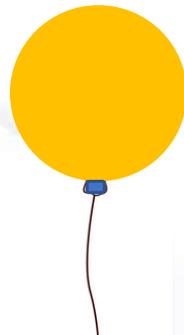
open  
archive



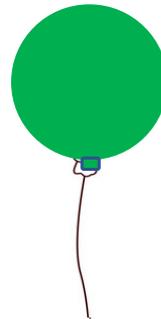
published  
discussions



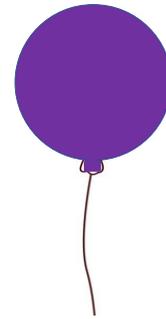
no  
archive



Corridor chat



Presentations



Scientific papers

Discussion forums



norecopa

Feedback

English-language newsletters

**Contact oss**  
+47 41 22 09 49  
post@norecopa.no

**Street address**  
Ullevålsveien 68  
0454 Oslo

**Postal address**  
% Norwegian Veterinary  
Institute  
P.O. Box 750 Sentrum  
N-0106 Oslo, Norway

**Shortcuts**  
> Give us some feedback!  
> 2010/63/EU  
> Information material  
> Norecopa's Board  
> Secretariat  
> Sponsors  
> Cookies & Privacy  
> Site map

**Subscribe to our newsletter**  
Your email address:  Register  
> Browse our latest newsletters

Org.no **[norecopa.no/WC11-wiki](http://norecopa.no/WC11-wiki)**  
Bank account: 7694 05 12030  
(IBAN: NO51 7694 0512 030)  
(payment must be marked  
'12025 Norecopa')

Norges miljø- og biovitenskapelige universitet

U.S. Department of Agriculture

Norecopa: PREPARE for better Science

*(Monday 23 August Session S200, 3.30-5.30 p.m.)*

**Norecopa [norecopa.no/WC11](https://norecopa.no/WC11)**

*(Thursday 26 August Session S311, 3.00-5.00 p.m.)*

**The PREPARE guidelines [norecopa.no/WC11-PREPARE](https://norecopa.no/WC11-PREPARE)**

*(Friday 27 August Session S113, 3.00-5.00 p.m.)*

**Wildlife research [norecopa.no/WC11-wildlife](https://norecopa.no/WC11-wildlife)**