Ressurser om Replacement på Norecopas nettsider

norecopa.no/erstatte

Adrian Smith
adrian.smith@norecopa.no

https://norecopa.no

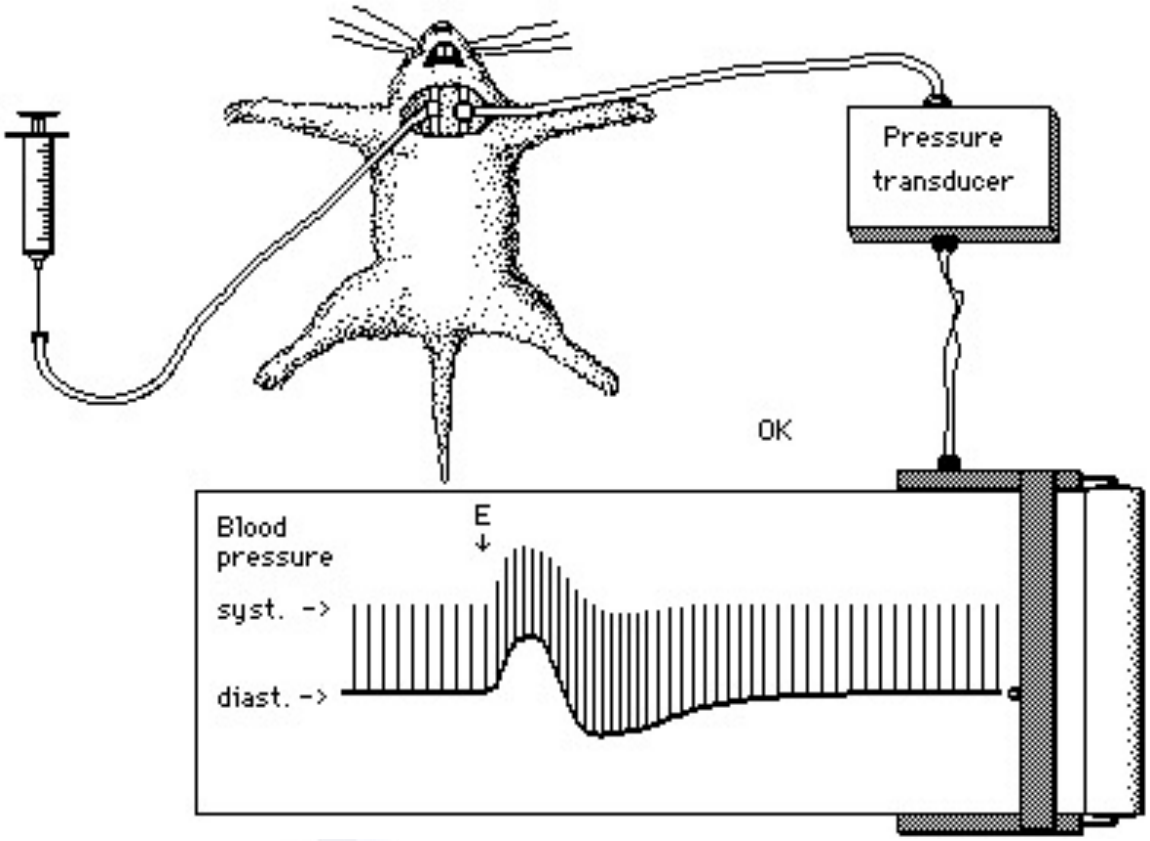
Norecopa: PREPARE for better Science

Rawle Report, 2023

Replacement is the area least well covered by existing review processes; the possibility for replacement is best considered at an early stage of the research planning process as AWERBs find it difficult to challenge once funding is in place. AWERBs and ASRU rarely have the detailed scientific expertise to determine whether replacements are available and suitable, so the best strategy for improving this situation would be to ensure that the expert peer review organised by the funders explicitly covers this area.

https://norecopa.no/replace

Bruk av dyr i undervisningen



Underviseren mister kontroll over innholdet

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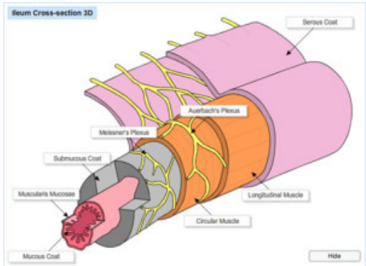
Guinea Pig Ileum

By David Dewhurst; Philip Larkman and Stewart Cromar

Record number: 5830d (legacy id: 855)
Category: Pharmacology
Type: Computer Program

A computer simulation program to teach the effects of drugs and electrical stimulation on the enteric nervous system. Type of record: Computer Program. Category: Pharmacology (animal).



A computer simulation program to teach the effects of drugs and electrical stimulation on the enteric nervous system.

This program simulates an isolated preparation of the guinea pig ileum, a smooth muscle preparation exhibiting little spontaneous contractile activity, which is extensively used for pharmacological studies. Its aim is to enable the exploration of the effects of drugs and electrical stimulation on the release of, and response to, neurotransmitters in the enteric nervous system. Simulated responses are derived from a model which presents the contractile response of the ileum both to added drugs and to transmural electrical stimulation. Learning is through exploration and the program places at the disposal of the user a range of DRUGS (acetylcholine, histamine, clonidine, morphine, naloxone, phentolamine, atropine, mepyramine) which may be added alone or in combination to the organ bath in a range of DOSES, and an electrical STIMULATOR. A 'magic' WASH facility instantly removes all traces of added drugs and greatly speeds up the process of data collection compared to the real experiment. Simulated contractions of the gut are presented on a scrolling display comparable to that of a chart recorder. Students may take measurements directly from the monitor.

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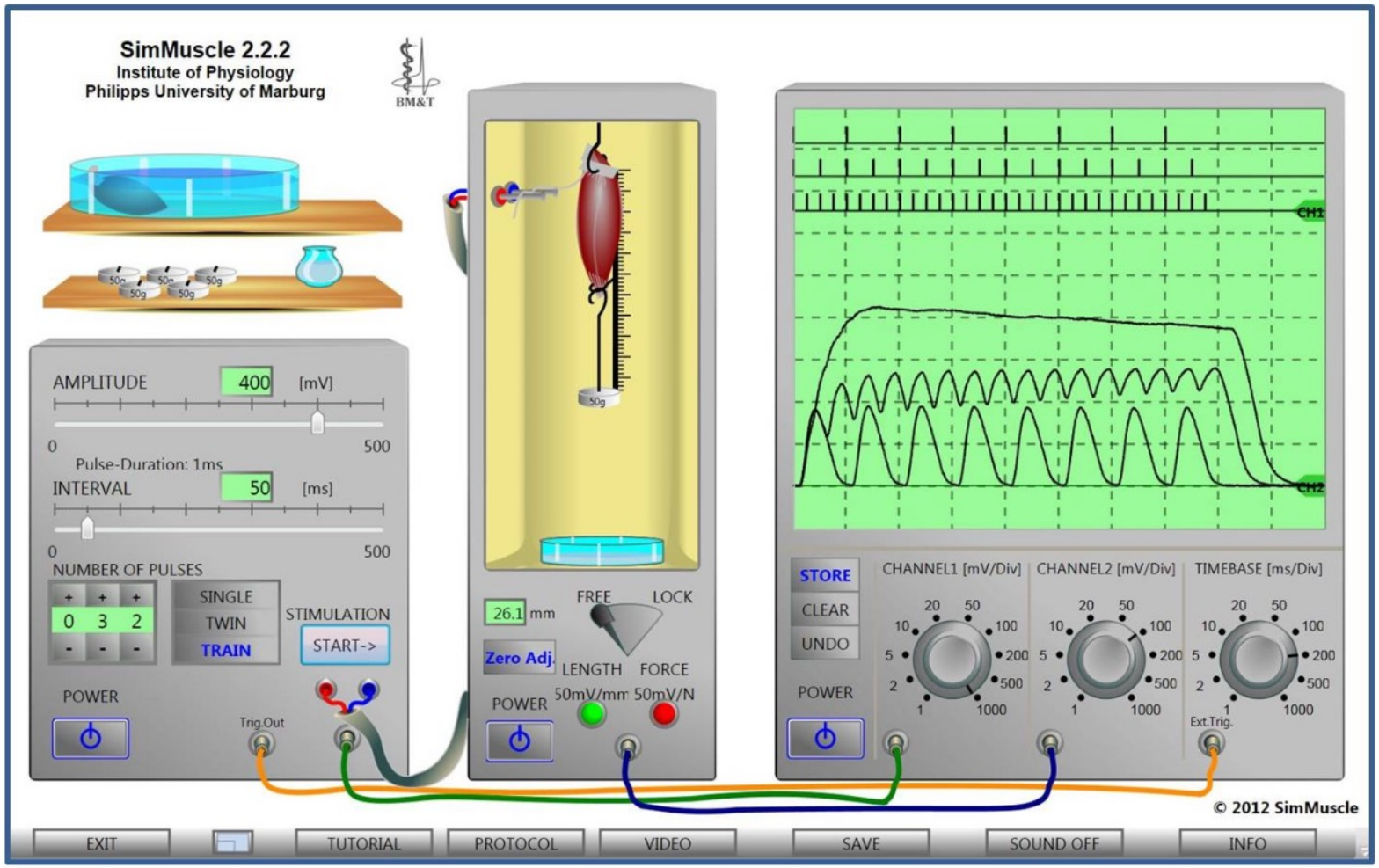

SimMuscle

Hans Braun, Marberg virtual-physiology.com

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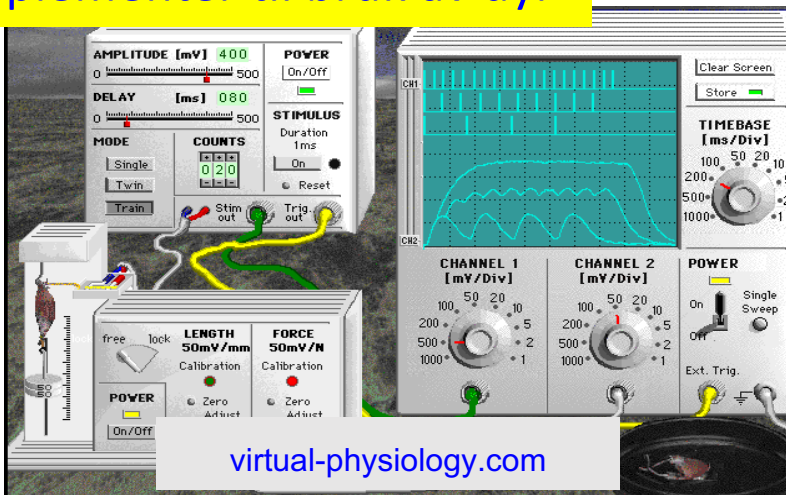
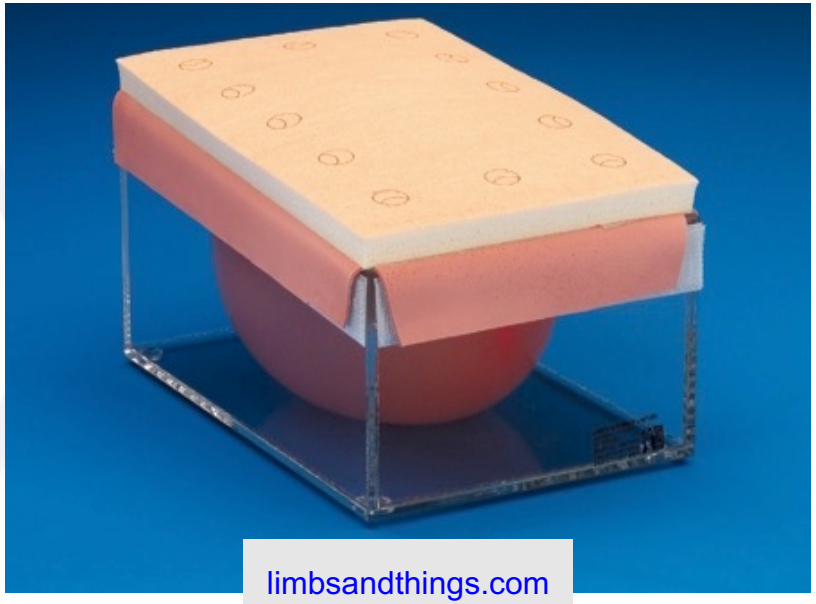
norecopa.no/NORINA 3.500 alternativer/supplementer til bruk av dyr

frogvirtualdissection.com



virtual-physiology.com

rescuecritters.com



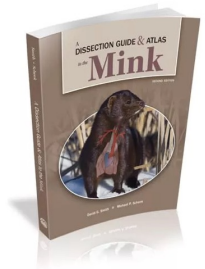
limbsandthings.com

TextBase:

2.100 bøker

norecopa.no/textbase

Home > Life Sciences > Biology > Dissection Guides > A Dissection Guide & Atlas to the Mink, 2e



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$36.00

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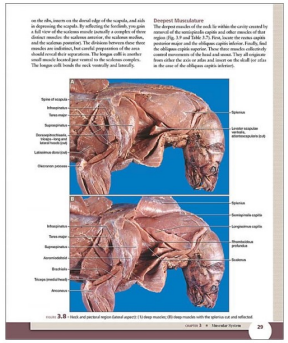
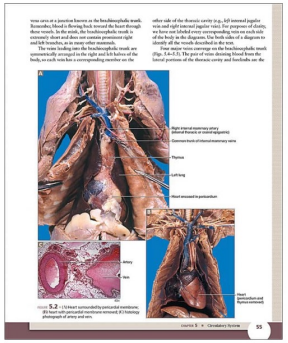
A Dissection Guide & Atlas to the Mink, 2e

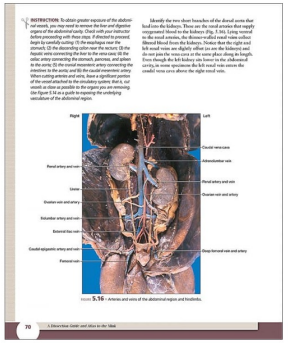
By David G. Smith, Michael P. Schenk · © 2020 · 136 Pages
Loose-leaf Format · Print ISBN 9781640430525 · eBook ISBN 9781640430532

This full-color dissection manual is intended to provide an introduction to the anatomy of the mink for biology, zoology, nursing, or preprofessional students who are taking a laboratory course in anatomy and physiology or basic vertebrate anatomy.

Examples of interior pages:





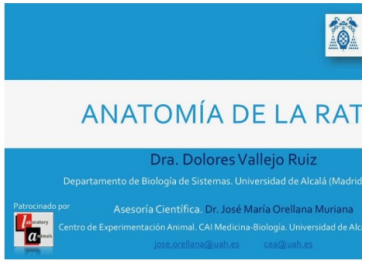


https://www.morton-pub.com/product/a-dissection-guide-atlas-to-the-mink-2e

norecopa.no/education-training/films-and-slide-shows

Rat s.c. injection
Norecopa | 1,380 views

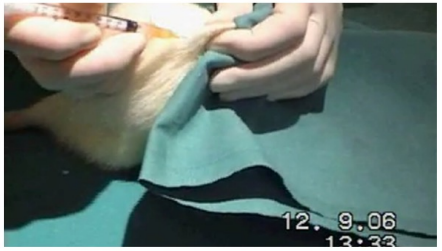
Rat i.p. injection (method 2)
Norecopa | 1,280 views



Anatomia de la rata
Norecopa | 977 views

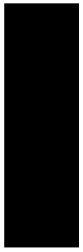
Testing anaesthetic depth in the chicken
Norecopa | 598 views

Blood collection from the saphenous vein in the mouse
Norecopa | 6,777 views

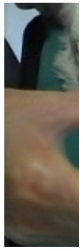


Subcutaneous injection in the rat - Technique 1
Norecopa | 2,249 views

Blood san
Norecop



Blood san
Norecop



Blood san
Norecop

Blood sampling from the pig
Norecopa | 3,914 views

Intravenous injection in a rabbit
Norecopa | 2,025 views

Lifting a rabbit
Norecopa | 2,420 views

Subcutaneous injection in the rabbit
Norecopa | 1,479 views

Subcutaneous injection in the chicken
Norecopa | 1,806 views

Immobilisation of the rabbit
Norecopa | 2,072 views

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Multimediarom, NVH

Workshop i 2018: norecopa.no/education-training/homemade-educational-materials

professor Rikke Langebæk, Københavns universitet

https://dvt.ddd.dk/artikler/artikler/guldsaks-toejdyr-og-24-7-laering-nyt-veterinaert-simulationslaboratorium-skal-styrke-fremtidens-dyrlaeger

norecopa.no/media/8099/langebæk.pdf

’We may need the animals, as it were, on the night; but the machines will do very well at rehearsals’

”Alternativer” kan være for dårlige til å erstatte dyr fullstendig, men gode nok til å la studentene prøve og feile på objekter som ikke kan lide – eller for å diskutere forbedring av en prosedyre etterpå

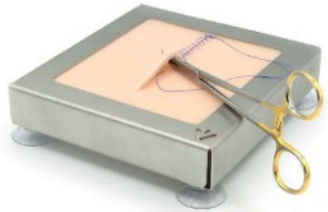
Veterinary Skills Network, Freie Universität Berlin

vet skills net

Development of veterinary simulators as an interactive teaching method

Laura Schüller

vetiqo.com/en/products/



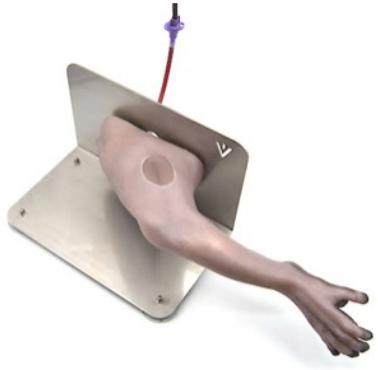
Suture skills

Injection skills

Bones

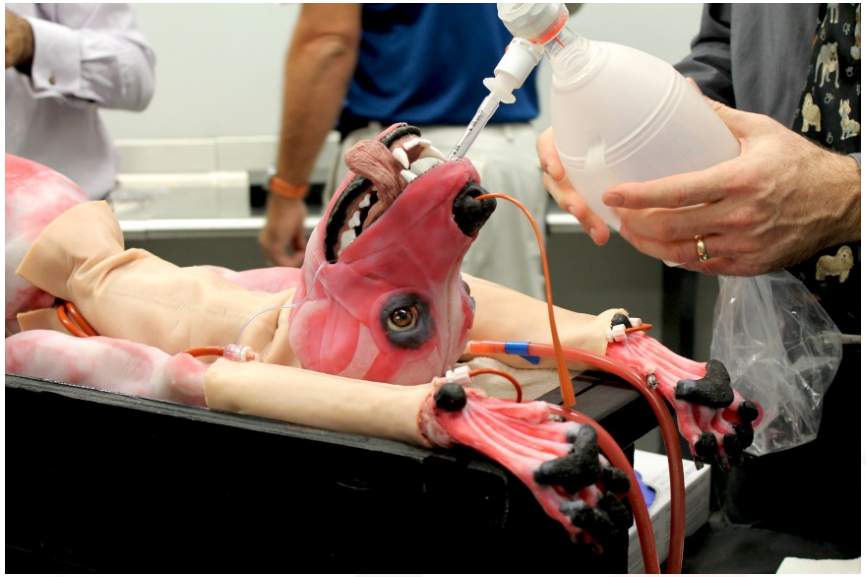
Gyndog

Castro & Weany



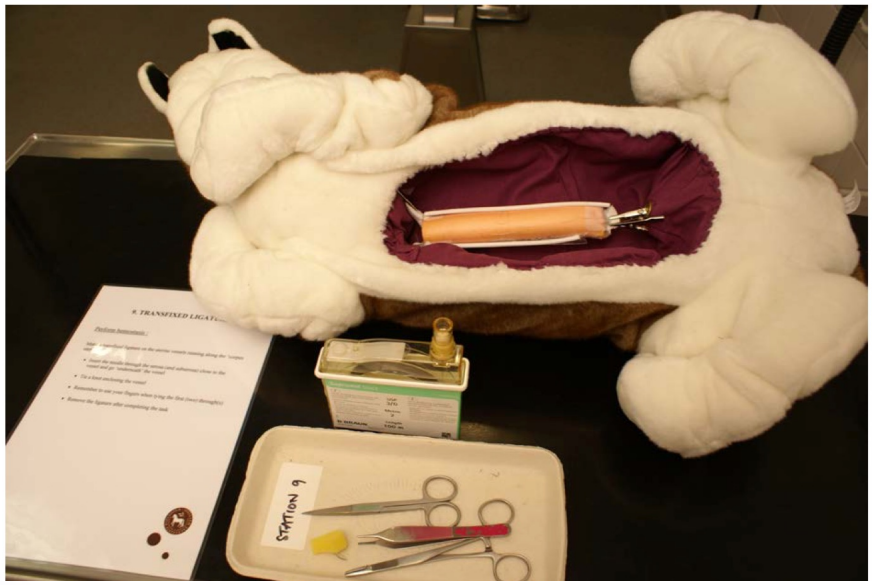
Rita Rhesus

Fidelity and Discrimination



https://syndaver.com

High Fidelity, Low Discrimination



Rikke Langebæk, University of Copenhagen

Low Fidelity, High Discrimination

Russell & Burch advarte mot '**the high-fidelity fallacy**':

En erstatning trenger ikke ligne fysisk på dyremodellen for å være et godt alternativ.

https://norecopa.no/alternatives/nams-and-nats

The acronym **NAT** was introduced specifically to describe procedures that replace current animal use, i.e. ***Non-Animal Technologies***. For example, a computer simulation of the classic nerve-muscle preparation which has been used for many years in undergraduate Physiology classes. A NAT Roadmap has been published for the UK.

The acronym **NAM**, on the other hand, is generally used for ***New Approach Methodologies***, i.e. methods which were not developed explicitly to replace or reduce animal research*. Scientists who use animals today may (or may not) find them to be suitable alternatives, or supplements, to their *in vivo* research. NAMs often have little resemblance to an animal model (for example, use of the human placenta), but they are often valuable because they involve the use of human tissue. The NC3Rs provides a resource network and a project overview for NAMs.

Some institutions, such as the UK NC3Rs, Utrecht University, and the RSPCA in their report on Supporting Replacement in Academia, use the acronym NAMs for **Non-Animal Methods, which covers both what we refer to here as Non-Animal Technologies and New Approach Methodologies. The FDA use NAMs to mean "New Approach Methods". See also the definition of NAMs from the British Toxicological Society.*

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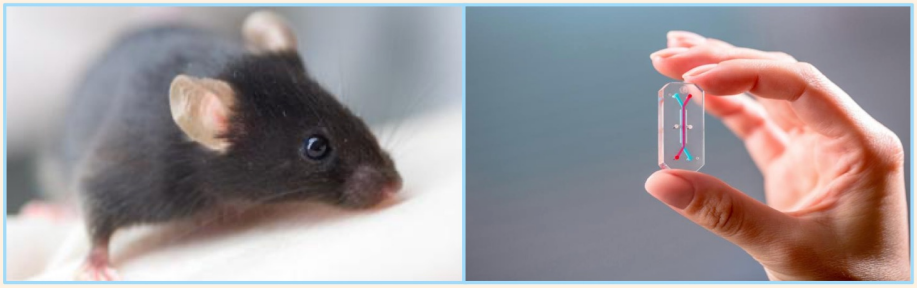
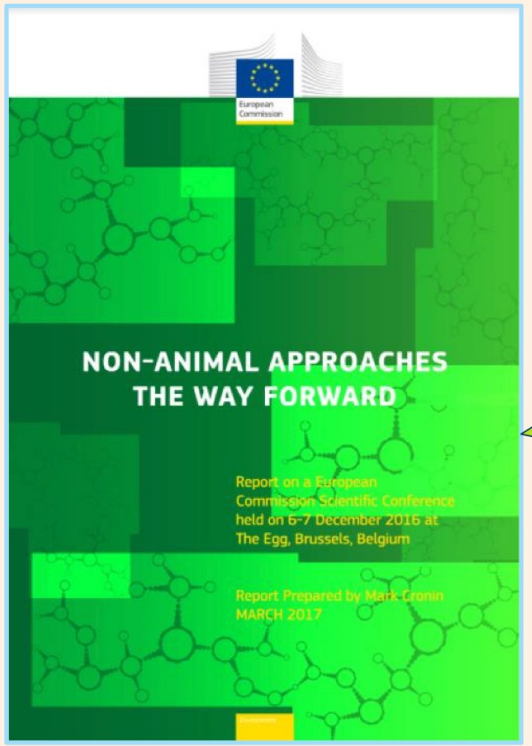
RSPCA ANIMALS IN SCIENCE

Supporting Replacement in Academia



BARNEY REED

https://norecopa.no/18



*"…**new technologies will not implement themselves**, neither will the obstacles to their implementation be resolved automatically."*

https://ec.europa.eu/environment/chemicals/lab_animals/3r/pdf/scientific_conference/non_animal_approaches_conference_report.pdf

*"In general, there appears to be **a tendency to use the model that is available rather than the best model for the question** and this approach can lead to poor reproducibility and translation. In addition, risk aversion means researchers tend to use the same model, **'stick to what they know'**, as changing models is perceived to be difficult due to validation concerns and associated costs, risk of failure, and funding insecurities."*

www.ukri.org/wp-content/uploads/2022/03/final-5040-JS-Publishing-Models-Report-A4_CB_v8.pdf

2015

Press release

Animal testing to be phased out faster as UK unveils roadmap for alternative methods

New plan backs researchers to seize on new and developing opportunities to phase out animal tests with specific commitments for the coming years.

From: Department for Science, Innovation and Technology, Department for Environment, Food & Rural Affairs, Home Office and Lord Vallance

Published 11 November 2025

- Government vows to phase out animal tests as alternative methods come on stream with new strategy welcomed as 'ambitious' and 'timely' by animal welfare and life sciences organisations
- New £75 million funding will help bring forward new testing methods for products that can save lives and make path to regulation clearer for researchers
- Strategy developed by government with life sciences, business and animal welfare organisations, meeting government's manifesto commitment

2025

https://nc3rs.org.uk/sites/default/files/documents/NonAnimalTechCO082_RYE_4_nrfinal2.pdf

https://www.gov.uk/government/news/animal-testing-to-be-phased-out-faster-as-uk-unveils-roadmap-for-alternative-methods

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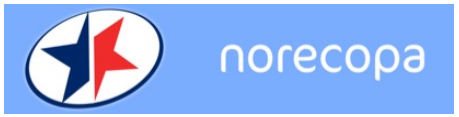

1-Literature searches

Literature searches help to:

- identify possible non-animal alternatives to all or part of the proposed study
- prevent unnecessary repetition of animal studies
- identify efforts to reduce animal numbers
- identify refinements to procedures in the planned study

1a Form a clear hypothesis, with primary and secondary outcomes.

General principles | For fish researchers

Literature searches should be well documented, including information on:

1. Evidence from the literature that the animal studies have not been performed previously, or that repetition is justified
2. Consultation of relevant guidelines for specific parts of the study

Use The Replacement Checklist (Jukes, Beale & Camp, 2025)

There is more information on Literature searches and systematic reviews and on this webpage about SYRCLE.

More resources

https://norecopa.no/PREPARE

Alternatives to Laboratory Animals

Replacing Animal Research

Impact Factor: 3.1
5-Year Impact Factor: 3.6

Free access | Review article | First published online March 1, 2025 | Request permissions

Reviewing Current Guidance for the 'R' of Replacement and Rethinking it with the 'Replacement Checklist'

Juliet P. Dukes, Amy Beale, and Celean Camp View all authors and affiliations

Volume 53, Issue 2 | https://doi.org/10.1177/02611929251319265 | View article versions

Who was approached for advice?

- ☐ **Which networks, communities or individuals?**
  Were any peers, or subject specific experts consulted? Or any of the expected beneficiaries of the research?
- ☐ **Were any 3Rs or 1R organisations approached for expert advice?**
  Several organisations exist to progress and promote the 3Rs, some of which focus solely on replacement. Where any of these organisations approached for advice?

How was the search conducted?

- ☐ **What combination of operators and search terms was used?**
  Were search terms combined appropriately?
- ☐ **Were search string(s) constructed?**
  Were the combined search terms and operators recorded?
- ☐ **Were different types of searches used for different sources of information?**

Why were the results of the search(es) rejected?

- ☐ **Were the results of the search provided?**
  Have any references (papers, technical information) about potential techniques, or combinations of techniques, reported?
- ☐ **Were the results relevant to the field?**
- ☐ **Could any identified protocols be adapted to suit?**
  What changes would need to be made to existing techniques in order to achieve research goals? Are any in development?
- ☐ **If results were rejected, was it justifiable to do so? Was the output thoroughly evaluated?**
  Has evidence of assessment been provided? Were any approaches found to be relevant to the research? What were the limitations of the approaches found? Would there be an opportunity to replace part of the overall programme of work?

What subject area(s) did the search(es) cover?

- ☐ **Are the search terms and variants used provided?**
  Searching for potential animal replacements within any given field requires a combination of search terms: subject-specific terms, and keywords focusing on techniques avoiding animal use. Many non-animal approaches with the potential to provide useful data and replace animal use will not necessarily be tagged in literature with '3Rs', 'replacement', or 'alternative' so it is helpful to use terms implying non-animal methods e.g. in vitro, microphysiological, model, assay etc.
- ☐ **Are the search terms relevant to the field of study?**
  What subject-specific terms were used to try and identify alternative approaches appropriate to the field? Were any variants of keywords included? (Please note that some databases automatically generate variants of search terms)
- ☐ **Is there anything missing from search methodology?**

Where was information obtained?

- ☐ **Which databases were searched?**
  Has a list of the databases or other sources of information been provided? Were multiple sources of information explored?
- ☐ **Which websites were searched?**
  Have specific (and relevant) websites been included in the report of the search for alternatives?
- ☐ **Was any other 'grey literature' included?**
  Has any 'grey literature' been mentioned? Did the search include pre-registered protocols, pre-prints of papers or information produced outside of traditional publishing and distribution channels, including reports, policy literature, newsletters, government documents, white papers or similar?

When were the articles published, and the search(es) completed?

- ☐ **What publication years were included?**
  Science and technology can progress rapidly, did the search involve the most up to date publications? What years of publication or release were included in the search?
- ☐ **When was the search conducted?**
  How long prior to the application being completed and submitted was the search conducted?
- ☐ **Was it repeated?**
  Was the search repeated at multiple time points, or was it carried out only once?

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Det er også behov for små skritt...

f.eks. erstatning av Foetal Calf Serum and Matrigel

Fetal bovine serum: how to leave it behind in the pursuit of more reliable science

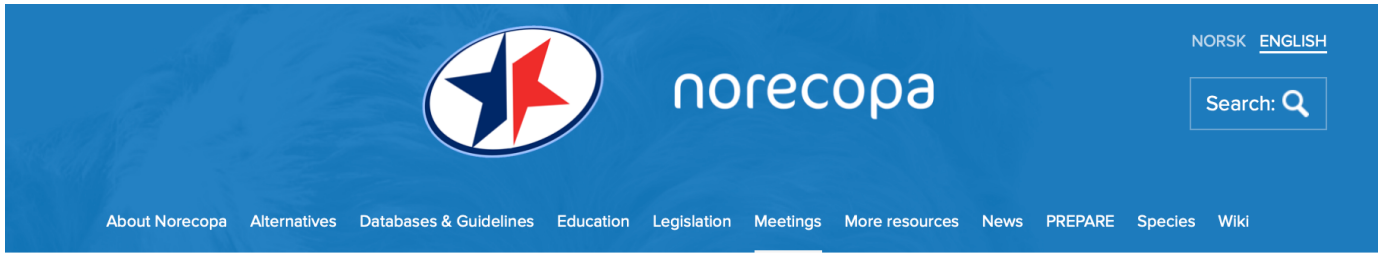
Tilo Weber [1], Atena Malakpour-Permlid [2], Aline Chary [3], Vito D'Alessandro [4] [5], Leah Haut [1], Sebastian Seufert [6], Esther Veronika Wenzel [7], James Hickman [8], Karen Bieback [9], Joachim Wiest [10] [11], Wilhelm Gerhard Dirks [12], Sandra Coecke [13], Stina Oredsson [14]

https://pmc.ncbi.nlm.nih.gov/articles/PMC12371577/pdf/ftox-07-1612903.pdf

Tissue extracellular matrix hydrogels as alternatives to Matrigel for culturing gastrointestinal organoids

Suran Kim [# 1], Sungjin Min [# 1], Yi Sun Choi [1], Sung-Hyun Jo [2], Jae Hun Jung [3], Kyusun Han [3], Jin Kim [1], Soohwan An [1], Yong Woo Ji [3 4], Yun-Gon Kim [2], Seung-Woo Cho [5 6 7]

https://pmc.ncbi.nlm.nih.gov/articles/PMC8967832



norecopa.no / Meetings / Meetings Calendar

norecopa.no/meetings/meetings-calendar

Webinar and Meetings calendar

November 2025

- ESTIV Applied Training Course, Bratislava, 16-21 November 2025
- LASA conference, West Midlands, 17-19 November 2025 (FELASA Severity Workshop on 17 November)
- 18th SECAL Congress, Bilbao, 18-21 November 2025
- Innovative development of a rodent shelter for post-operative care, webinar (Lena William-Olsson
  2025
- Making the Most of Your Animal Assessment Data, CCAC
- 3Rs Symposium and networking event
- NAMs and Regul
  , webinar (Hayley Gooding, Justyna Rzepecka &
- and Machines, Nantes, 19-21 November 2025
- boration: AWERB and scientist united, RSPCA webinar, 20 November 2025
- Humanely ending the life of laboratory rodents, webinar (Petra Seebeck), 20 November 2025
- Closing animal welfare gaps - It's time for analgesia in chicken embryos, webinar (Christine Baumgartner), 20 November 2025
- *In vitro* human brain models, webinar (Anna Herland & Robin Pronk), 20 November 2025
- 49th AFSTAL congress, Nantes, 19-21 November 2025
- Novel Approaches for Behavioral Assessment of Rodents, Bochum, 24 November 2025
- Anaesthesia and Perioperative Care of Laboratory Animals, online workshop, 24 November - 5 December 2025
- The 3Rs in Wildlife Research, webinar (Jonas Malmsten & Johan Lindsjö), 25 November 2025

+ nettsider for innspilte webinarer, sortert etter emnene i PREPARE

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The Norecopa website also includes five other collections:

- NAL: a collection of literature references relating to the 3Rs from the US National Agricultural Library
- European Commission datasets:
  - 3Rs Knowledge Sources: over 800 resources collected by the Commission in 2016
  - 3Rs Education and Training Resources, over 560 items collected in 2018
  - Non-animal models for respiratory tract diseases, over 280 models identified in a literature review of over 21,000 papers, published in 2020
  - Non-animal models for cardiovascular diseases, citing over 400 models, identified in a literature review of over 14,000 papers, published in 2022

The EU Commission has now published 30 datasets of this type, including reviews of non-animal models within breast cancer, neurodegenerative diseases, immuno-oncology and immunogenicity testing for advanced therapy medicinal products.

Here is an alphabetical global list of all the databases cited on the Norecopa website.

https://norecopa.no/databases

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Newsletter no. 4-2025 from Norecopa

Welcome to Norecopa's fourth newsletter of 2025. This is the 129th newsletter which we have issued.
We hope you find them of use! We welcome feedback, positive or negative.

Please share this newsletter with your colleagues and friends, and encourage them to subscribe!

We are also on LinkedIn and (to a much lesser extent) on Facebook.

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This newsletter contains the following items (if some links do not appear to work, check that your mail program has opened the whole of the newsletter):

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norecopa.no : "an up-to-date overview of global 3R resources"

Norecopa: PREPARE for better Science