

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Utilizzo degli strumenti idonei alla raccolta di informazioni relative alle Tre R e loro divulgazione

Ozzano Emilia, 30/01/2020

Monica Forni

Dipartimento di Scienze Mediche Veterinarie

Ho pensato ad una sitografia

**Quello che non ho trovato non
l'ho cercato abbastanza!**



Circa 547.000 risultati (0,58 secondi)

The principle of reducing waste, reusing and recycling resources and products is often called the "3Rs." ... Recycling means the **use** of waste itself as resources. Waste minimization can be achieved in an efficient way by focusing primarily on the first of the **3Rs**, "reduce," followed by "reuse" and then "recycle."

The 3R Initiative

<https://www.env.go.jp/recycle/3r/en/outline.html>

Informazioni su questo risultato Feedback

The 3R Initiative

<https://www.env.go.jp/recycle/3r/en/outline.html> Traduci questa pagina

The principle of reducing waste, reusing and recycling resources and products is often called the "3Rs." ... Recycling means the use of waste itself as resources. Waste minimization can be achieved in an efficient way by focusing primarily on the first of the 3Rs, "reduce," followed by "reuse" and then "recycle."

The 3Rs | NC3Rs

<https://www.nc3rs.org.uk/the-3rs> Traduci questa pagina

The principles of the 3Rs (Replacement, Reduction and Refinement) were developed over 50 years ago ... Methods which avoid or replace the use of animals.

Working Group on the Application of the 3Rs in Regulatory Testing of ...

<https://www.ema.europa.eu/committees/.../expert-group-3rs> - Traduci questa pagina

Working Group on the Application of the 3Rs in Regulatory Testing of Medicinal Products. Share. The Joint Committee for Medicinal Products for Veterinary Use ...

Reduce, Reuse, Recycle
Replace, Reduce, Refine

Libri

- The Principles of Humane Experimental Technique. Russell and Burch 1959

http://altweb.jhsph.edu/pubs/books/humane_exp/het-toc

- Principles of Laboratory Animal Science. L. F. M. van Zutphen, V. Baumans, A.

<https://www.amazon.it/Principles-Laboratory-Animal-Science-Zutphen/dp/0444814876>



Replacement

PROBLEMs in getting engagement in replacement

TRADITIONS favouring animal studies

SOPS in the Laboratory, publications, age of professor

PREJUDICES/SCEPTISM towards introducing new methods

Will not work, no comparative measures, not scientific

LACK OF RELEVANCE which can be stated as

In our area we have always used animal models

LACK OF EXAMPLES

The 3R area is still developing and need more substantiation

Validation

Human relevance

LACK OF TOOLS

Databases under development/diverse

No full overview



Replacement

- Johns Hopkins Center for Alternatives to Animal Testing ([CAAT](https://caat.jhsph.edu))

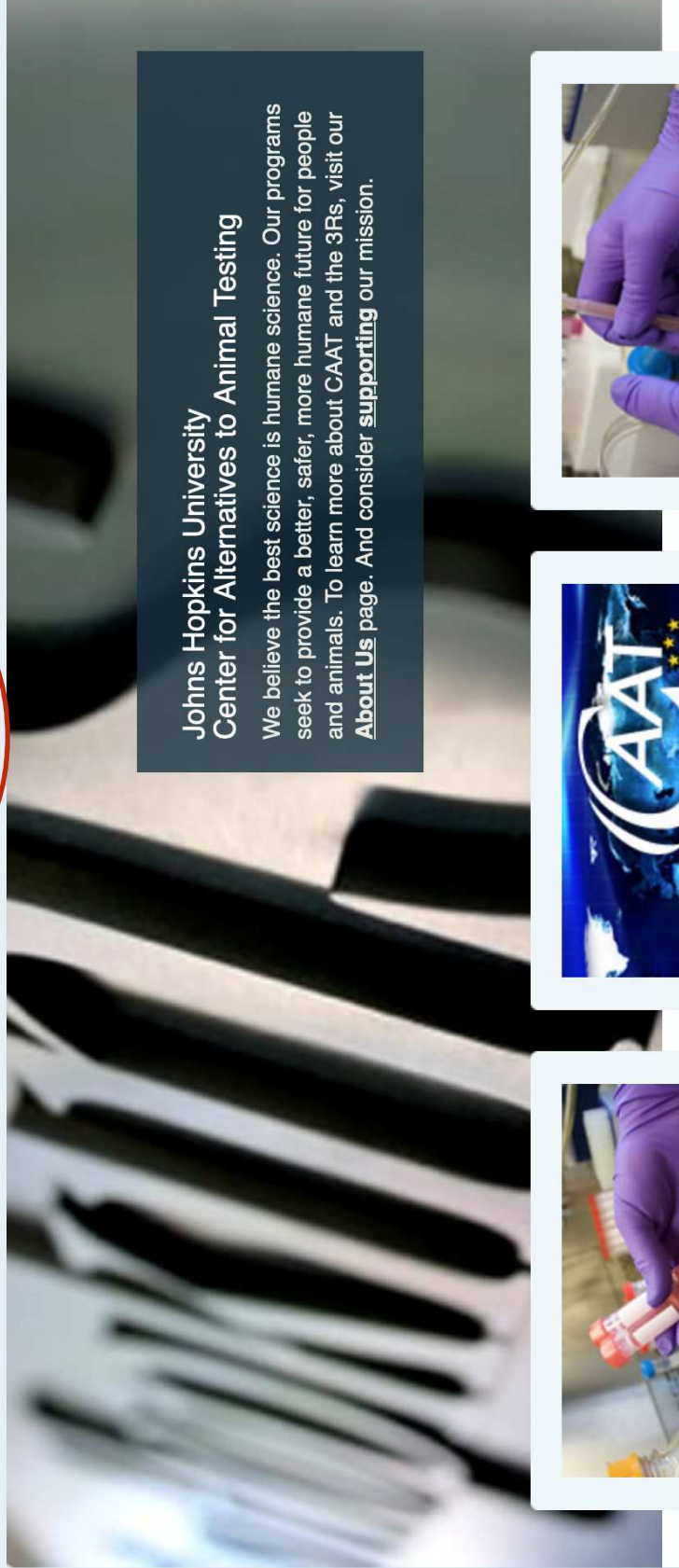
<https://caat.jhsph.edu>

- CAAT Europe

<https://www.biologie.uni-konstanz.de/leist/caat-europe/>




Attenzione CAAT è un esempio di limitata integrazione delle 3R, molto spostato verso il Replacement con anche alcune posizioni criticabili





Johns Hopkins University Center for Alternatives to Animal Testing

We believe the best science is humane science. Our programs seek to provide a better, safer, more humane future for people and animals. To learn more about CAAT and the 3Rs, visit our **About Us** page. And consider **supporting** our mission.





For the most up-to-date news and information, please sign up for our CAATwalk email newsletter [here](#). The newsletter archives are available [here](#).

Media Center

CAAT 25th
Anniversary
Documentary

See also: [CAAT Publications Index](#)

View all of our videos on the [CAAT YouTube Channel](#)

New Videos:

60 Years of the 3Rs: Lessons Learned and the Road Ahead

[Full Symposium Playlist](#)

A celebration of the 60th Anniversary of the publication of [The Principles of Humane Experimental Technique](#) by W.M.S Russell and R.L. Burch. This event, which featured some of the eminent scientists and researchers in the field of alternatives to animal testing, took place on November 22, 2019 at the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland. The event was sponsored by CAAT, Foundation for Chemistry Research and Initiatives, Alternative Research & Development Foundation (ARDF), The American Cleaning Institute (ACI), International Fragrance

<https://www.youtube.com/playlist?list=PLq3BABAyKtzmq0D4g5G0xfZwgtJAcqXiC>



Replacement

- Johns Hopkins Center for Alternatives to Animal Testing ([CAAT](https://caat.jhsph.edu))

<https://caat.jhsph.edu>

- CAAT Europe

<https://www.biologie.uni-konstanz.de/leist/caat-europe/>

Attenzione CAAT è un esempio di limitata integrazione delle 3R, molto spostato verso il Replacement con anche alcune posizioni criticabili

- IPAM, Italian Platform on Alternative Methods

<https://www.ipamitalia.org>





mercoledì 29 Gennaio 2020

Accedi / Registrati



NEWS



ARTICOLI



INIZIATIVE



DOCUMENTI



CHI SIAMO



disponibili 15 posizioni per Giovani Ricercatori – H2020 SINERGIA.

disponibili 15 posizioni per Giovani Ricercatori – H2020 SINERGIA.

24 Novembre 2019

Workshop “Il Principio delle 3R per una visione comune”

Ecopa Symposium 2019: Non-Animal Methodologies: research, testing, assessment and applications

FARMINDUSTRIA

Premio IPAM Farmaindustria: prorogata la scadenza per la presentazione delle domande

Diventa un cittadino scienziato

27 SETTEMBRE 2019

NOTTE EUROPEA DEI RICERCATORI

18.00-23.00

Notte Europea dei Ricercatori 2019:

<https://www.ipamitalia.org/chi-siamo/>



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Replacement

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- IPAM, Italian Platform on Alternative Methods

<https://www.ipamitalia.org>

- EURL ECVAM Database on Alternative Methods to Animal Experimentation (DB-ALM)

<https://ec.europa.eu/jrc/en/eurl/ecvam>





EU SCIENCE HUB

The European Commission's science and knowledge service

European Commission > EU Science Hub > Eurl > Ecvam

Search



Welcome to Norecopa's new website

- Home
- About Us
- Research
- Working With Us
- Procurement
- News & Events
- Our Communities

Home

EURL ECVAM news

Alternative methods for toxicity testing

- Validation and submission process
- Validated test methods
- Computational methods

- IATA - Integrated Approaches to Testing and Assessment
- Advisory and consultation bodies
- EU-NETVAL validation laboratories

Knowledge sharing on the Three Rs

- Finding information on alternative methods
- Knowledge networks
- Education and training
- Life science research

FAQs

Contact us

EU Reference Laboratory for alternatives to animal testing

Welcome to the European Union Reference Laboratory for alternatives to animal testing - EURL ECVAM!

EURL ECVAM is an integral part of the Joint Research Centre (JRC), the science and knowledge service of the European Commission and is located at the JRC site in Ispra, Italy.

Activities

The mandate of EURL ECVAM is specified in EU legislation on the protection of animals used for scientific purposes and includes a number of duties to advance the Replacement, Reduction and Refinement (the Three Rs) of animal procedures.

The current activities of EURL ECVAM build on over 25 years of JRC support to the Three Rs and include:

- conducting research and collaborating in EU and international research initiatives;
- coordination and undertaking of validation studies of alternative methods for the safety assessment of chemicals;

Related Publications

- Utility of a next generation framework for assessment of genomic damage: a case study using the industrial chemical benzene
- Bridging Across Methods in the Biosciences
- Artificial Intelligence for Chemical Risk Assessment
- Neuronal specific and non-specific responses to cadmium possibly involved in neurodegeneration: a toxicogenomics study in a human neuronal cell model
- In vitro RHE skin sensitisation assays: Applicability to challenging substances

More >

Updates News



Call for tender - mapping mechanistic toxicology on



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EU SCIENCE HUB

The European Commission's science and knowledge service

European Commission > EU Science Hub > Eurl > EU Reference Laboratory for alternatives to animal testing > Alternative methods for toxicity testing > Validated Test Methods

[Home](#) [About Us](#) [Research](#) [Knowledge](#) [Working With Us](#) [Procurement](#) [News & Events](#) [Our Communities](#)

Home
EURL ECVAM news
Alternative methods for toxicity testing
Validation and submission process
Validated test methods
Acute toxicity
Aquatic toxicity
Aquatic bioconcentration and bioaccumulation
Biologicals
Carcinogenicity
Eye irritation/Serious eye damage
Genotoxicity
Phototoxicity
Repeated Dose Toxicity
Skin Corrosion
Skin Irritation
Skin Sensitisation
Toxicokinetics
Computational methods

Validated test methods

EURL ECVAM has contributed to the validation of the test methods listed below.

The validation of other test methods has been undertaken by **ICATM** (International Cooperation on Alternative Test Methods) partners. More details are available [here](#).

Acute toxicity

Acute systemic toxicity testing involves an assessment of the general toxic effects of a single dose or multiple doses of a chemical or product, within 24 hours by a particular route (oral, dermal, inhalation), and that occur during a subsequent 21-day observation period.
Read more [here](#).

- [Acute oral toxicity: the 3T3 Neutral Red Uptake \(NRU\) cytotoxicity assay](#)

Aquatic toxicity

Aquatic toxicity in general refers to the effects of a chemical on organisms living in

Related Publications

Utility of a next generation framework for assessment of genomic damage: a case study using the industrial chemical benzene

Bridging Across Methods in the Biosciences

Artificial Intelligence for Chemical Risk Assessment

Neuronal specific and non-specific responses to cadmium possibly involved in neurodegeneration: a toxicogenomics study in a human neuronal cell model

In vitro RHE skin sensitisation assays: Applicability to challenging substances

[More >](#)

Updates News

Computational methods
IATA - Integrated Approaches to Testing and



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able to elicit an allergic response in susceptible individuals.
Read more [here](#).

- The human Cell Line Activation Test (h-CLAT)
- The KeratinoSens™ assay
- The Direct Peptide Reactivity Assay (DPRA)
- U937 cell line activation test (U-SENS™)
- LuSens assay

Toxicokinetics

Toxicokinetics describes how the body handles a chemical, as a function of dose and time, in terms of the concept of ADME (absorption, distribution, metabolism and excretion).

Read more [here](#).

More information on each of these methods, including the EURL ECVAM Recommendations, can be found in:

- the **latest EURL ECVAM Status Report**
- the **EURL ECVAM Tracking System for Alternative methods towards Regulatory acceptance (TSAR)**
- the **EURL ECVAM Database Service on Alternative Methods to Animal Experimentation (DB-ALM)**

<https://ec.europa.eu/jrc/en/scientific-tool/database-alternative-methods-animal-experimentation>

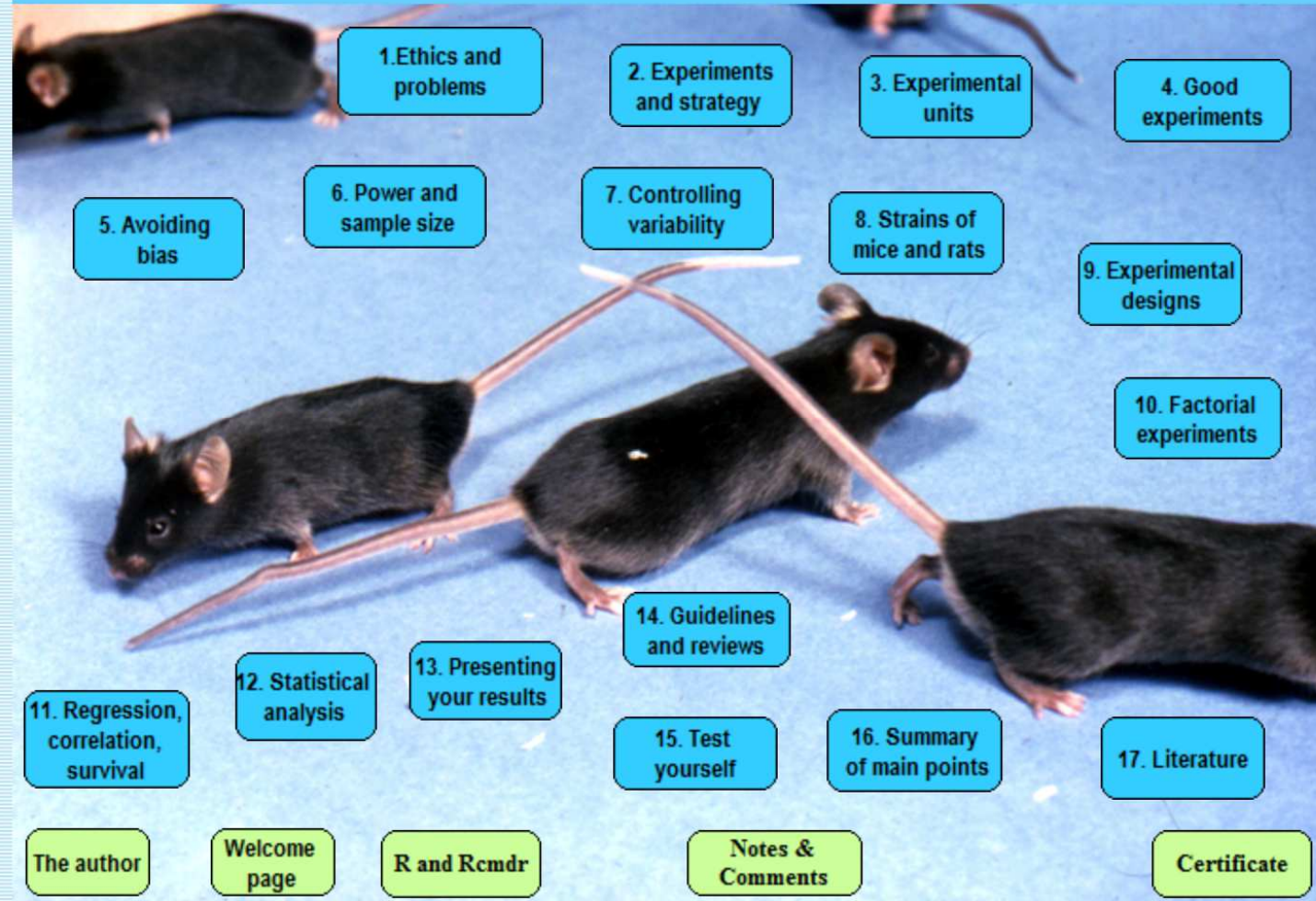


Reduction

- 3Rs- Reduction.co.uk
<http://www.3rs-reduction.co.uk>



Home Page and Main menu



Michael FW Festing

<http://www.3rs-reduction.co.uk>



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Reduction

- 3Rs- Reduction.co.uk
<http://www.3rs-reduction.co.uk>

- Syrcle sistematic review
<https://www.radboudumc.nl/en/research/departments/health-evidence/systematic-review-center-for-laboratory-animal-experimentation>



Centri 3Rs

- Il nuovo Centro Interuniversitario per la Promozione dei Principi delle 3R nella Didattica e nella Ricerca

<http://www.centro3r.it/wp/>





Centro 3R

[CHI SIAMO](#)

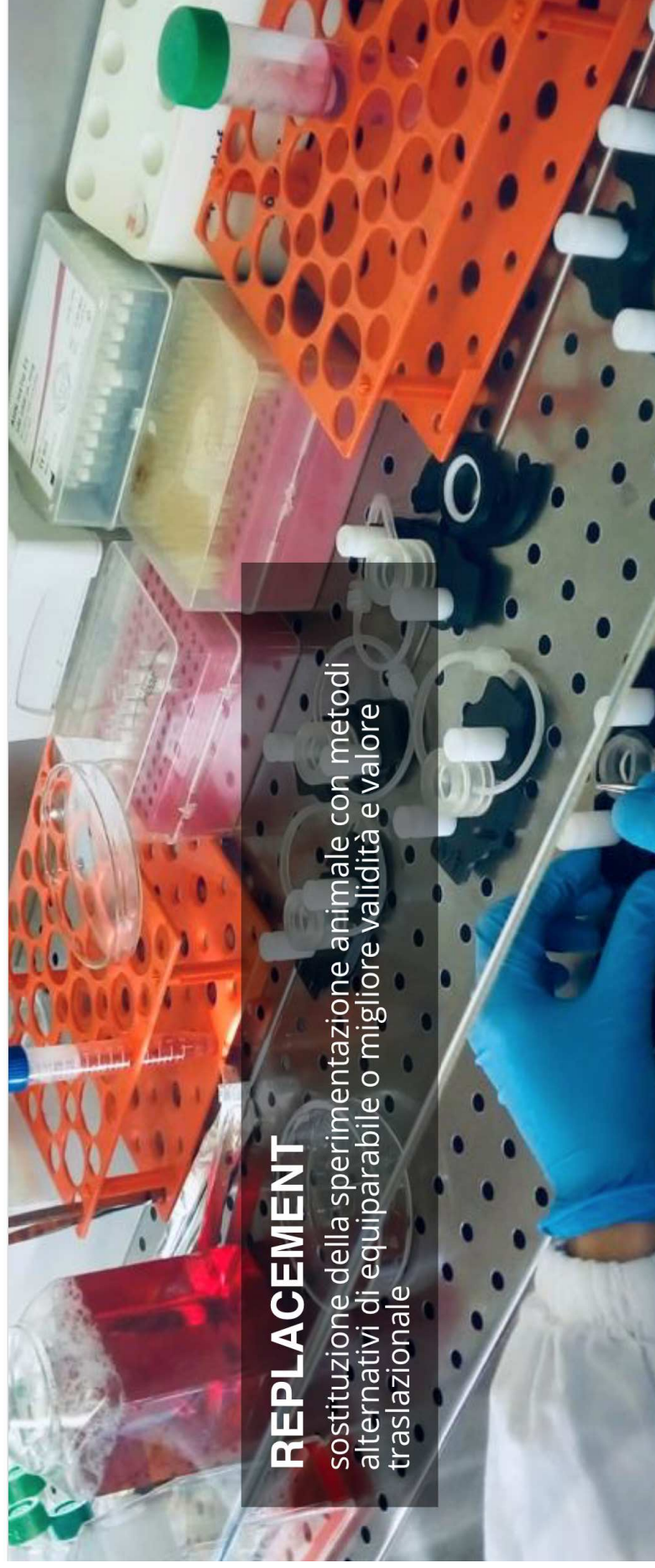
[LE 3R](#)

[RISORSE](#)

[NEWS](#)

[EVENTI](#)

[CONTATTACI](#)



REPLACEMENT

sostituzione della sperimentazione animale con metodi alternativi di equiparabile o migliore validità e valore traslazionale





Didattica	Dispense
Ricerca	Slide
Altri Centri 3R	Corsi

<http://www.centro3r.it/it/slide>



Centri 3Rs

- Il nuovo Centro Interuniversitario per la Promozione dei Principi delle 3R nella Didattica e nella Ricerca

<http://www.centro3r.it/wp/>

- Il Centro 3Rs Inglese

<https://www.nc3rs.org.uk>



Minimising aggression in group-housed male mice
Read the results of our international mouse aggression study, recently published in Scientific Reports.



Tech3Rs: our animal technician newsletter



Explore the evidence base for refined mouse handling

NC3Rs guidelines

[ARRIVE guidelines](#)

[Institutional framework for the 3Rs](#)

[Non-human primate accommodation, care and use](#)

[Responsibility in the use of animals in bioscience research](#)

Topic-specific resources

[Analgesia](#)

[Anaesthesia](#)

[Best practice for animal transport](#)

[Euthanasia](#)

[Handling and restraint](#)

[Humane endpoints](#)

[Microsampling](#)

[Training animals](#)

[Welfare assessment](#)

[Wildlife research](#)

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<https://www.nc3rs.org.uk/handling-and-restraint>



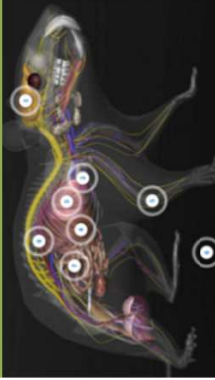
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Blood sampling



Refining blood sampling from laboratory animals - advice on technique, route and volumes.

E-learning resources



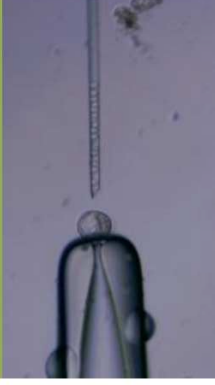
Online modules funded by the NC3Rs, which are freely available for training and continuing professional development.

Experimental design



Resources to aid researchers improve the design and reporting of research using animals.

Genetically altered mice



Information to help with the implementation of approaches to reduce and refine the use of GA mice.

Grimace scales



Housing and husbandry



How to pick up a mouse



Increasing human tissue use



LABORATORY ANIMAL ANAESTHESIA

AN INTRODUCTION

The facility veterinarian arrives and introduces herself.



Hi, I'm Claire. We are due in the lab soon but I'm free to chat now if you have any questions?

What is anaesthesia?

Why would you anaesthetise an animal?

Why is it important to get it right?

What are the 3Rs?

Is anaesthesia safe for the animal?

<https://nc3rs.org.uk/e-learning-resources>



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Peer review and advice service



How we support funders to embed the 3Rs in their policies and practice.

Procedures with care



A dedicated website of online tutorials and guidance to support the adoption of best practice for commonly used procedures in animal research.

Reuse of needles



Learn more about why the single-use of needles should be standard practice and how to implement this in your facility.

Rodent welfare hub

The year of laboratory rodent welfare



Resources and outputs from our programmes related to laboratory rodent welfare.

Welfare of non-human primates



<http://www.procedureswithcare.org.uk>

Centri 3Rs

- Il nuovo Centro Interuniversitario per la Promozione dei Principi delle 3R nella Didattica e nella Ricerca

<http://www.centro3r.it/wp/>

- Il Centro 3Rs Inglese

<https://www.nc3rs.org.uk>

- NORECOPA

<https://norecopa.no/welcome>



Norecopa

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



norecopa.no

One (intelligent) search engine for everything – you no longer need to know the names of the databases



Organisations of relevance to animal research

Organisations within Laboratory Animal Science

- [AAALAC International](#) (Association for Assessment and Accreditation of Laboratory Care International)
- [AALAS](#) (American Association for Laboratory Animal Science)
- [ACLAM](#) (American College of Laboratory Animal Medicine)
- [AniMatch](#) (an online sharing platform for the exchange of organs and tissues)
- [ARSAL](#) (Asociatia Română pentru Știința Animalelor de Laborator; Romanian Laboratory Animal Science Association)
- [ASLAP](#) (American Society of Laboratory Animal Practitioners)

over 7,500 webpages
80,000 references
22,000 unique links
approx. 160,000 pageviews / year



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The search engine

The screenshot shows a search engine interface with several highlighted and circled elements:

- The search input field contains the text "Guidelines bleeding mice" and is circled in red.
- The "Search" button is highlighted in blue.
- The "Enable synonyms and stemming" checkbox is checked and circled in red.
- The "Category" section is circled in red, listing various categories with counts, such as "Agricultural animals (5)", "Anaesthesia (3)", "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)", and "Education and training (3)".
- The "Auto-complete function:" section is highlighted in yellow, showing a list of suggestions: "blood", "blood collection", "blood from", and "blood sampling".
- The "Synonym list:" section is highlighted in yellow, listing: "Bleeding, bloodsampling, blood sampling, venepuncture, blood collection, phlebotomy".

- Advanced algorithms using Fuzzy Logic and Boolean Logic
- Supports wildcards, proximity searches and truncation

A help file is available:

The screenshot shows a search engine help page with the following content:

- Search all Norecopa's databases and webpages simultaneously:
- Add search term
- Welcome to Norecopa, Norway's 3R centre!
- [*The PREPARE Guidelines for Planning Animal Research and Testing*](#)
- [Search engine help file](#) (circled in red)
- [SHORT CUT: Searching for animal research](#)
- More about Norecopa's databases: [3R Guide](#) - [NORINA](#) - [TextBase](#) - [Classic AVs](#) - [NAL](#)
- [Norecopa: the first 10 years \(2007-2017\)](#)
- [Reviews of the website](#)



Search for 'bleeding mice' on Google and Norecopa.

The image displays a Google search for "bleeding mice" on the left and a Norecopa search interface on the right. The Google search results show 12,600,000 results, with a video thumbnail for "Blood Collection in Mice" from Penn State. The Norecopa interface shows 76 results, with the top result being "NIH Animal Research Advisory Committee Guidelines for Survival Bleeding of Mice and Rats" (3R Guide/10891). The Norecopa interface also includes search filters and a list of databases.

Google Search Results:

- Search: bleeding mice
- Results: Omtrent 12 600 000 resultaten (Google)
- Videoer: Blood Collection in Mice (Penn State - 20. jan. 2014)
- Bleeding the Laboratory (https://www.ncbi.nlm.nih.gov/av/J Hoggatt - 2016 - Siter av 7 28. nov. 2015 - The laboratory m studies and for assessment of b Abstract - MATERIALS AND ME)
- Blood sample collection (https://www.ncbi.nlm.nih.gov/av/S Parasuraman - 2010 - Siter Collection of blood from small laboratory animals is necessary for a wide range of scientific This method is recommended for blood collection only in mice. GENERAL PRINCIPLES OF ... - PROTOCOL FOR BLOOD ...)

Norecopa Search Interface:

- Search: bleeding mice
- Search filters: Order by: Relevance; Enable synonyms and stemming
- Browse the databases: eBooks (6), Free (5), Held at NMBU Oslo (contact kristine.hansen@nmbu.no) (5), Key products (6), On loan (2), Reviewed
- Database: 3R Guide (6), Classic AVs (6), Website (6), NORINA (35), TextBase (23)
- Search in the databases: All Text, Title, Author, Publisher
- 76 results
- NIH Animal Research Advisory Committee Guidelines for Survival Bleeding of Mice and Rats (3R Guide/10891)
- Blood sampling: Blood sampling is one of the commonest procedures conducted on research animals, but it may cause pain, distress and lasting harm if the technique is poor, or if too much of the circulating blood volume is removed. Videos and slide series showing blood sampling techniques on several common laboratory animal species. Links NC3Rs Microsite on blood sampling Films and slide shows on bleeding techniques...
- Blood Collection in Mice Using the Saphenous Vein - An Alternative to Retro Orbital Collection (NORINA/8641)



Search all Norecopa's databases and webpages simultaneously:

bleeding mice

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

[Search engine help file](#)

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

76 results

NIH Animal Research Advisory Committee Guidelines for Survival Bleeding of Mice and Rats

3R Guide/10891

These guidelines have been developed to assist investigators and National Institutes of Health (NIH) Animal Care and Use Committees (ACUC) in their choice and application of survival rodent bleeding techniques.

Blood sampling

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

Blood Collection in Mice Using the Saphenous Vein - An Alternative to Retro Orbital Collection

NORINA/8641

These web pages describe a method for blood collection from the saphenous vein of mice, rats, hamsters, gerbils, guinea-pigs, mink and ferrets. Type of record: Web pages. Category: Veterinary Medicine

'Bleeding' not mentioned, but identified by the synonym list

Search filters

Order by:

Relevance

Enable synonymy and stemming

Browse the databases

eBooks (6)

Free (5)

Held at NMBU Oslo (contact kristine.hansen@nmbu.no) (5)

Key products (6)

On loan (2)

Reviewed

Database

3R Guide (6)

Classic AVs (6)

Website (6)

NORINA (35)

TextBase (23)

Search in the databases

All Text

Title

Author

Publisher



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3R Guide

www.3RGuide.info

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



Audiovisual products

NORINA

oslovet.norecopa.no/NORINA

Textbooks

TextBase

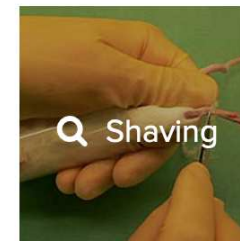
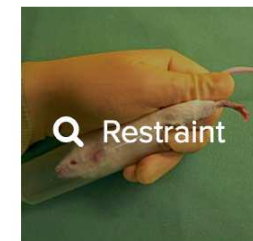
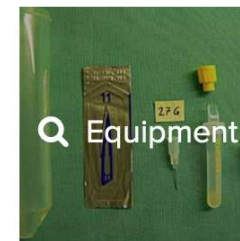
oslovet.norecopa.no/textbase



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Mouse

Immobilisation and bloodsampling from the saphenous vein



Films and slide shows of laboratory animals
<https://norecopa.no/education-training/films-and-slide-shows>



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Laura-Kim Schüller, Veterinary School, Berlin



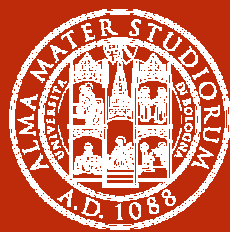
Rikke Langebæk, University of Copenhagen



- The ratlife

<http://www.ratlife.org>





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