

Map

Satellite

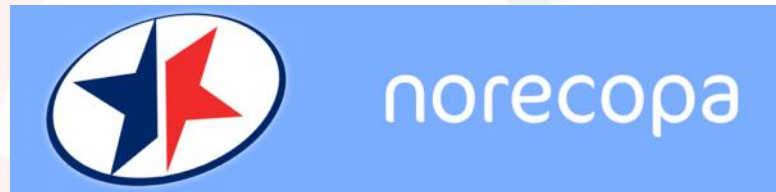
A new era of 3R resources and networking: the European 3R Centres

norecopa.no/171121

Adrian Smith

adrian.smith@norecopa.no


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



<https://norecopa.no>

Norecopa: PREPARE for better Science

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



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Database

- ☐ 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)

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- ☐ Free (199)
- ☐ Held at NMBU Oslo (contact...)

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- ☐ Record Number

approx. 8,500 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

we welcome more from you!



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+ webpages for past meetings and recorded meetings

norecopa.no/meetings/meetings-calendar

Webinar and Meetings calendar

November 2021

- > [Responsible Animal Research: Critical, Challenging and Creative Thinking](#), online course, 15-18 November 2021
- > [2nd Annual Aquatic Life Conference](#), virtual event, 15-18 November 2021
- > [Accelerating the transition to animal-free innovation: Measures for an action plan to phase-out experiments on animals](#), roundtable discussion, 16 November 2021
- > [Denmark's 3R-Center's Annual 3R Symposium](#), Copenhagen, 16-17 November 2021
- > [Annual LASA Conference](#), online, 16-18 & 23-25 November 2021
- > [AnimalFACS, practical workshop on facial expressions](#), 17 November (& 6 December) 2021
- > [Assessing the genotoxic potential of gene therapy products *in vitro*](#), webinar, 17 November 2021
- > [XVI SECAL Congress](#), Lleida, 17-19 November 2021
- > [Basement Membrane Extracts and replacements for clinical application areas](#), webinar session 3 of 4; 18 November 2021
- > [Validation of animal-free methods](#), webinar (Raffaella Corvi & Emma Pedersen), 19 November 2021

The background for the foundation of many 3R centres...



peta.org

Thanks to animal research, they'll be able to protest 20.8 years longer.



According to the US Department of Health and Human Services, animal research has helped extend our life expectancy by 20.8 years. Of course, how you choose to spend those extra years is up to you.

Foundation for Biomedical Research

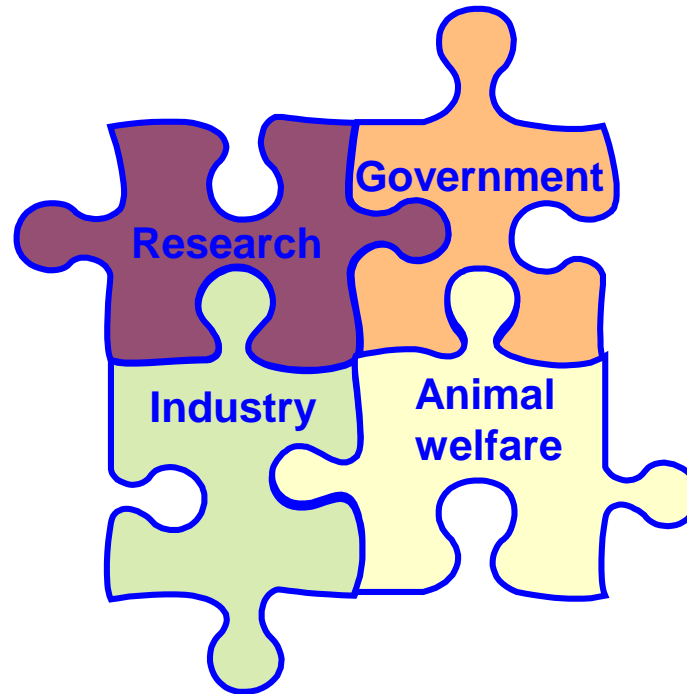
To demonstrate your support, write the Foundation for Biomedical Research, 818 Connecticut Ave, NW, Suite 301 Washington, DC 20006. Or call (202) 457-0634.

fbresearch.org

European Consensus-Platform for Alternatives
ecopa.eu



- Established in 2001
- Recognises **National Consensus Platforms** (NCPs) with **4 stakeholders** equally represented:



Norecopa was established in 2007

RSPCA
Marshall Hall



1824 1835

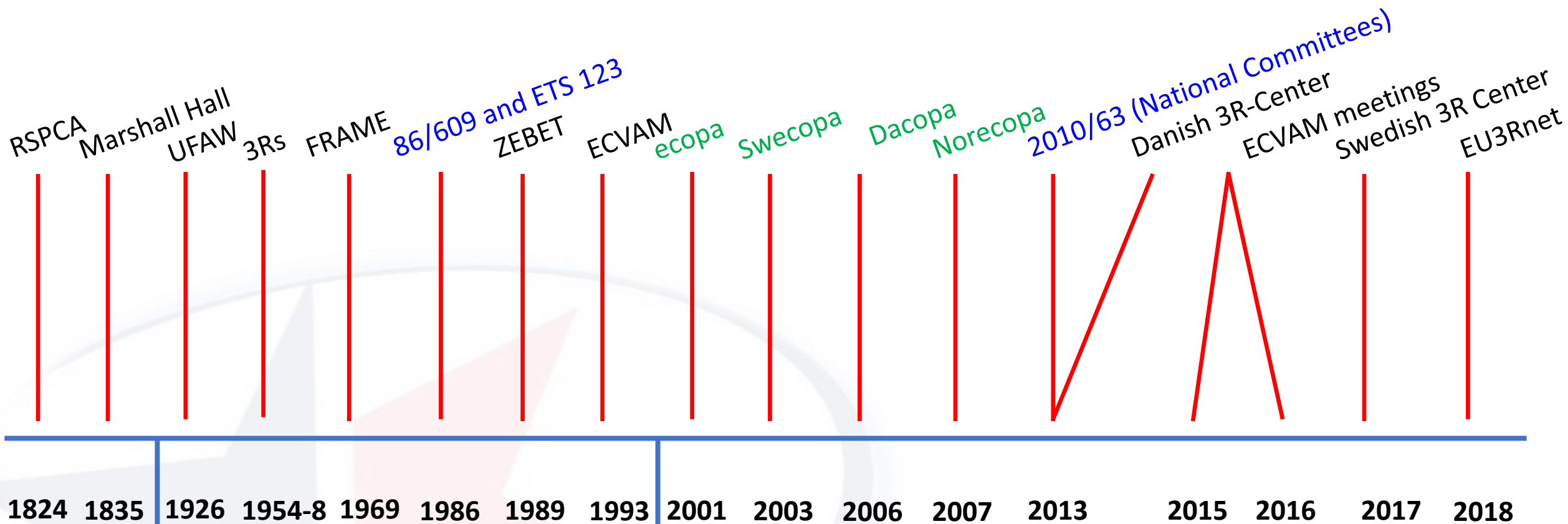


1790-1857

en.wikipedia.org

Marshall Hall: *Principles of Investigation in Physiology* (1835)

- An experiment should never be performed if the necessary information could be obtained by observations **(REPLACE)**
- No experiment should be performed without a clearly defined and obtainable, objective **(REFINE)**
- Scientists should be well-informed about the work of their predecessors and peers to avoid unnecessary repetition of an experiment **(REPLACE, REDUCE)**
- Justifiable experiments should be carried out with the least possible infliction of suffering (often through the use of lower, less sentient animals) **(REPLACE, REFINE)**
- Every experiment should be performed under circumstances that would provide the clearest possible results, thereby diminishing the need for repetition of experiments **(REDUCE)**





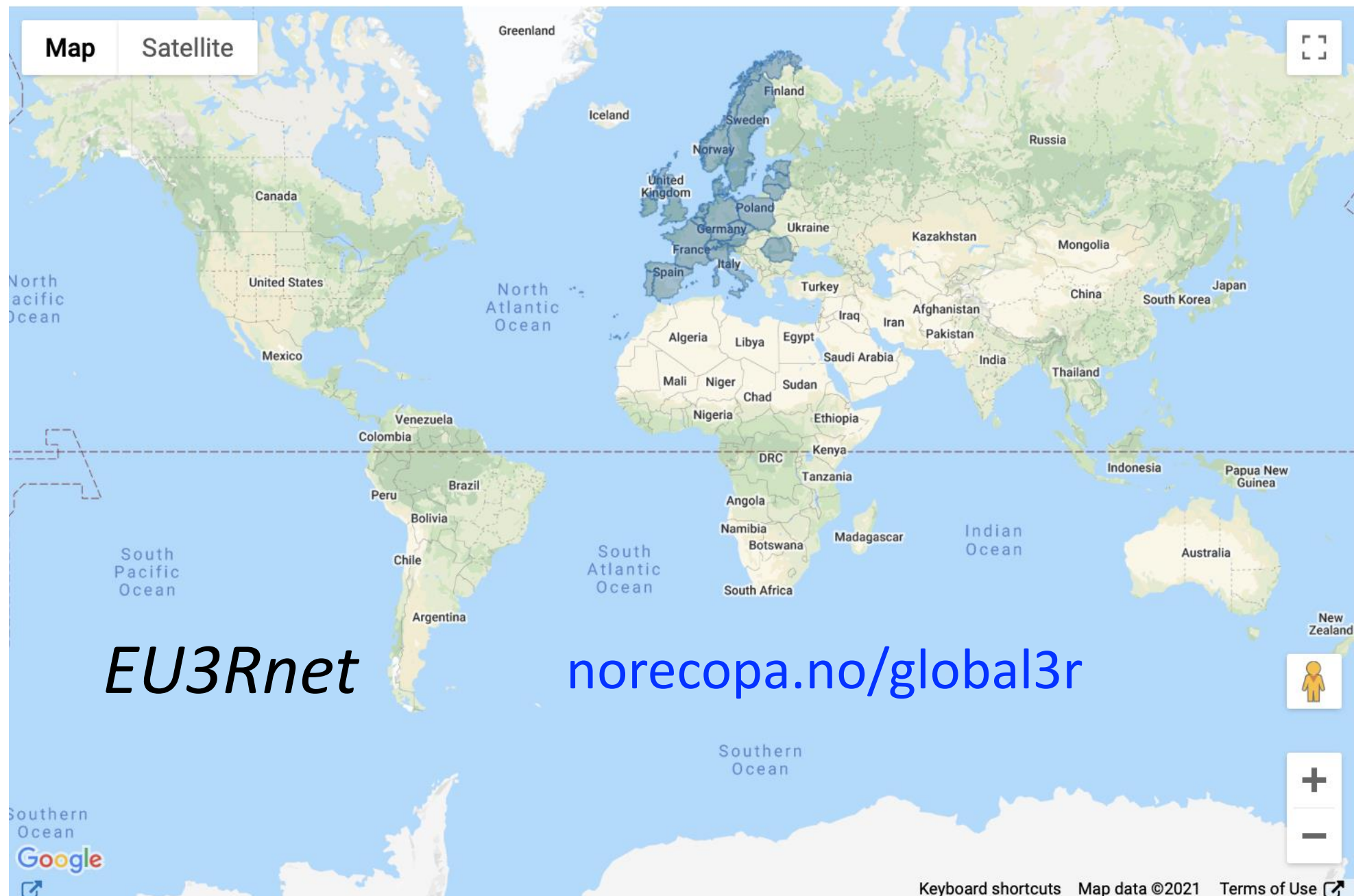
norecopa.no/global3r

Centres

- ☒ [Replacement](#) [i](#)
- ☒ [Reduction](#) [i](#)
- ☒ [Refinement](#) [i](#)
- ☐ [ecopa](#) [i](#)

Associations

- ☒ [AFLAS \(includes South Korea\)](#) [i](#)
- ☒ [Culture of Care Network](#) [i](#)
- ☒ [EU-NETVAL](#) [i](#)
- ☒ [EU3Rnet](#) [i](#)
- ☒ [FELASA](#) [i](#)
- ☒ [FESSACAL](#) [i](#)
- ☐ [Norecopa](#) [i](#)
- ☒ [Scand-LAS](#) [i](#)
- ☐ [ecopa](#) [i](#)



EU3Rnet

norecopa.no/global3r

Consensus Statement from the European Network of 3R Centres (EU3Rnet)

Winfried Neuhaus*

AIT - Austrian Institute of Technology GmbH, Center Health and Bioresources, Competence Unit Molecular Diagnostics, Vienna, Austria

A Network of European 3R Centres (EU3Rnet) was established in connection with the EUSAAT conference in 2018 in order to strengthen cooperation between different centres. Increased co-operation has a multitude of benefits, since many of the efforts made by local or regional centres are of national and international importance. As an important step, the members have decided to publish a consensus statement for the network.

Consensus Statement

EU3Rnet embraces all of the 3Rs (*Replacement*, *Reduction* and *Refinement*) throughout its work, since the 3Rs are the foundation of improved conditions for research animals and for better science.

EU3Rnet also considers it important to focus on *Non-Animal Methods*¹ as part of its collaborative efforts. *Non-Animal Methods* have largely been developed further after the introduction of the 3R concept by Russell and Burch² in 1959, thanks to technological advances in *in vitro* and *in silico* methods. EU3Rnet will therefore endeavour to promote this approach, so that researchers do not consider animal models by default when answering research questions, and instead consider the range of *Non-Animal*

Methods available, in order to avoid the unnecessary use of animal experimentation. When a relevant *Non-Animal Method* or an alternative *Replacement* method³ to an animal model does not exist, the possibilities for *Reduction* and *Refinement* of the model must be examined.

EU3Rnet considers it important that internationally relevant national efforts to develop and promote the 3Rs and *Non-Animal Methods* are disseminated within the network. The network will disseminate such information to its members, who in turn will disseminate the information further through their communication channels (which include websites, newsletters, symposia, training activities, annual reports and other channels).

EU3Rnet will emphasize the importance of involving all members of the research animal community in these efforts to develop and disseminate 3R resources. These include animal carers, technologists, veterinarians, teachers, lecturers and scientists.

All of the 3R centres in EU3Rnet pledge themselves to prioritization of their dissemination efforts. Whenever possible, they will use publicly available platforms to disseminate this knowledge, in order to maximize exposure.

Participants of EU3Rnet, who agreed to the consensus statement:

Institution	Country	URL
EUSAAT – European Society for Alternatives to Animal Testing	Europe	http://www.eusaat.org/
Unit Ethics and Human-Animal Studies, Messerli Research Institute, Vienna	Austria	https://www.vetmeduni.ac.at/en/messerli/science/ethik/
The RepRefRed society / Austrian 3R Center	Austria	https://www.reprefred.eu/EN

¹ Non-animal methods are defined as totally animal-free methods, not using any animal component.

² Russell, W. M. S. and Burch, R. L. (1959). *The Principles of Humane Experimental Technique*.
<https://caat.jhsph.edu/principles-of-humane-experimental-technique>

³ Replacement methods like *in vitro* methods might still be dependent on animal components such as fetal bovine serum or Matrigel.

* Winfried Neuhaus has submitted the Consensus Statement on behalf of all participating centres, institutes and societies of EU3Rnet.

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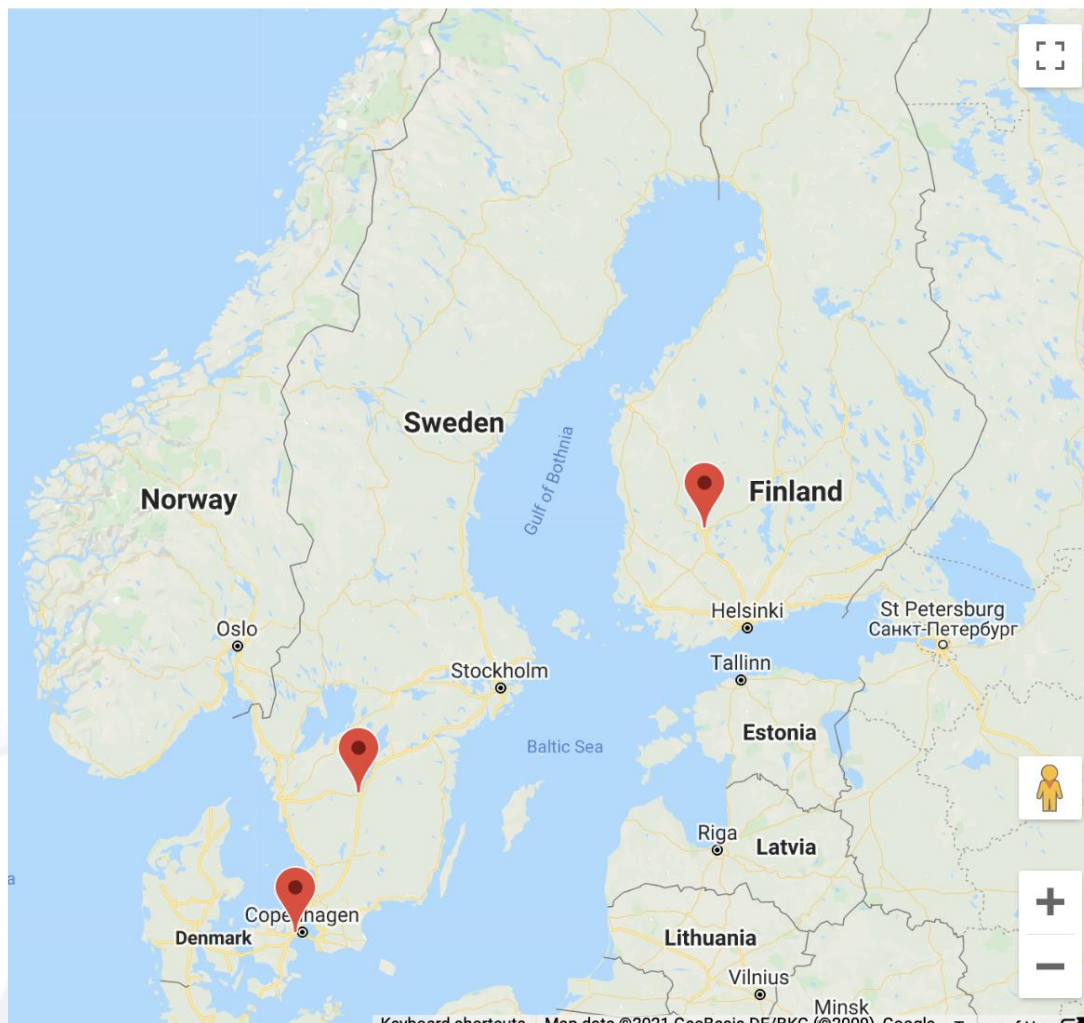
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- Emphasis on Non-Animal Methods (NAMs) in addition to the 3Rs
- Involvement of all members of the research community (scientists and animal care staff)
- Bottom-up approach
- Every 3Rs-centre, institute or society is welcome to join the network and sign the consensus statement
- Approx. 30 "3R centres" today

Applied for a COST Action in 2021:

- Dissemination
- Education
- Implementation
- Scientific Quality / Translatability
- Ethics



Centres

- ☒ [Replacement](#) i
- ☒ [Reduction](#) i
- ☒ [Refinement](#) i
- ☐ [ecopa](#) i

Associations

- ☐ [ACURET](#) i
- ☐ [AFLAS \(includes South Korea\)](#) i
- ☐ [Culture of Care Network](#) i
- ☐ [ecopa](#) i
- ☐ [EU-NETVAL](#) i
- ☐ [EU3Rnet](#) i
- ☐ [FELASA](#) i
- ☐ [FESSACAL](#) i
- ☐ [Norecopa](#) i
- ☐ [Scand LAC](#) i

Are there only three 3R-centres in the Nordic countries?

A question of definition

Norecopa's 3R Prizewinners – NOK 30,000



norecopa.no/about-norecopa/3r-prize



Culture of Care

The International Culture of Care Network
norecopa.no/coc

A demonstrable commitment, throughout the establishment, to improving:

- animal welfare
- scientific quality
- care of staff
- transparency for all stakeholders, including the public

It goes beyond simply complying with the law!

Communication and the Culture of Care

Penny Hawkins, RSPCA Research Animals Department
on behalf of the International Culture of Care Network*

Effective two-way communication between scientists and animal technologists is essential for a good Culture of Care
The European Commission suggests the 'development of formal and informal communication channels, for mutual benefit with respect to science and animal welfare'
Here are some examples from International Culture of Care network members

Regular meetings

Scheduled meetings for scientists, animal technologists, vets, unit managers and AWERB members



Regular refresher/update meetings

Special events

Duo-talks: researcher talks about their science, and animal technologists talk about techniques and animal care within the project



+ Quick Start Guide

Communication into existing processes

Each study has a pre-start and wash-up meeting involving everybody



Three Rs improvements reported to AWERB & shared at external user meetings



Other ideas

A 'boxless' event: anyone can submit 'out of the box' ideas to improve practice



A staff survey for all e.g. how much do you agree with statements such as 'in our group we listen to each others' ideas about animal welfare'



*norecopa.no/culture-of-care



norecopa.no/global3r

Culture of Care Network



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



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

There are lots of platforms...



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

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





Food for Thought ...

Beyond the 3Rs: Expanding the Use of Human-Relevant Replacement Methods in Biomedical Research

Kathrin Herrmann¹, Francesca Pistollato² and Martin L. Stephens¹

¹Johns Hopkins University, Bloomberg School of Public Health, Center for Alternatives to Animal Testing (CAAT), Baltimore, MD, USA; ²European Commission, Joint Research Centre (JRC), Ispra, Italy

Abstract

This year marks the 60th anniversary of Russell and Burch's pioneering book, *The Principles of Humane Experimental Technique*. Their 3Rs framework has helped to inspire humane and scientific progress in experimental technique. However, it is time to update its strategic application. The 21st century has already seen the development of promising, high-tech non-animal models, such as organs-on-a-chip and computational approaches that, in our view, will replace animals as the default option in biomedical experimentation. How fast this transition will take place will depend on the pace at which these new models are optimized to reflect the biology of humans, rather than that of non-human animals. While the new methods are likely to reshape all areas in which animals are currently used in science, we particularly encourage their application in biomedical research, which accounts for the bulk of animals used. We call for the pursuit of a three-prong strategy that focuses on (1) advancing non-animal methods as replacements of animal experiments, (2) applying them to biomedical research, and (3) improving their relevance to human biology. As academics and scientists, we feel that educational efforts targeted at young scientists in training will be an effective and sustainable way to advance this vision. Our strategy may not promise an imminent end to the use of animals in science, but it will bring us closer to an era in which the 3Rs are increasingly perceived as a solution to a receding problem. Russell and Burch themselves surely would have welcomed these positive changes.

1 Introduction

The Principles of Humane Experimental Technique, the landmark book that gave us the 3Rs framework of replacement, reduction, and refinement, turns 60 this year. First published in 1959, *Principles* was the outcome of a project spearheaded by the Universities Federation for Animal Welfare (UFAW), overseen by a committee that included future Nobel Prize-winning scientist Peter Medawar, and carried out by the British scientists William Russell and Rex Burch (Russell and Burch, 1959). The 3Rs framework helped to inspire and guide humane progress in experimental technique during the second half of the 20th century and beyond (Stephens and Mak, 2013; Balls et al., 2019).

The 60th anniversary of *Principles* falls in the midst of substantial developments in non-animal methods, i.e., potential replacement technology. Indeed, scientific experimentation is at the cusp of a new era of techniques hardly imagined in the mid-

20th century. Relevant techniques include (among others) organs-on-a-chip (microdevices containing cells and fluids intended to simulate physiological processes in organs); organoids (three-dimensional spheroids containing multiple cell types and intended to simulate physiological processes); high-throughput systems (rapid screening of large numbers of chemicals for biological activity against panels of different cells or biomolecules); induced pluripotent stem cells (adult cells that have been genetically reprogrammed to an embryonic stem cell-like state); and computational modeling (using computation to study the behavior of complex systems).

In our view, these methods (and no doubt others in various stages of development) have the potential to replace the use of animals as the default option in both safety testing and biomedical research. That is, these methods will come to comprise the rule, with animal experiments being the exception. This is consistent with Dutch efforts to expeditiously end animal experi-

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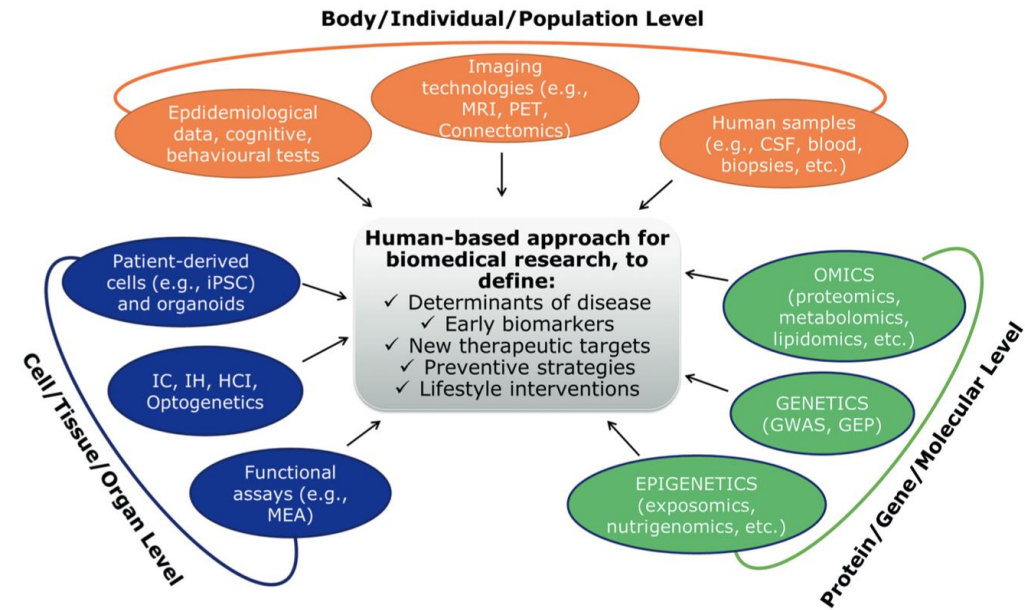
ALTEX 36(3), 343-352. doi:10.14573/altex.1907031

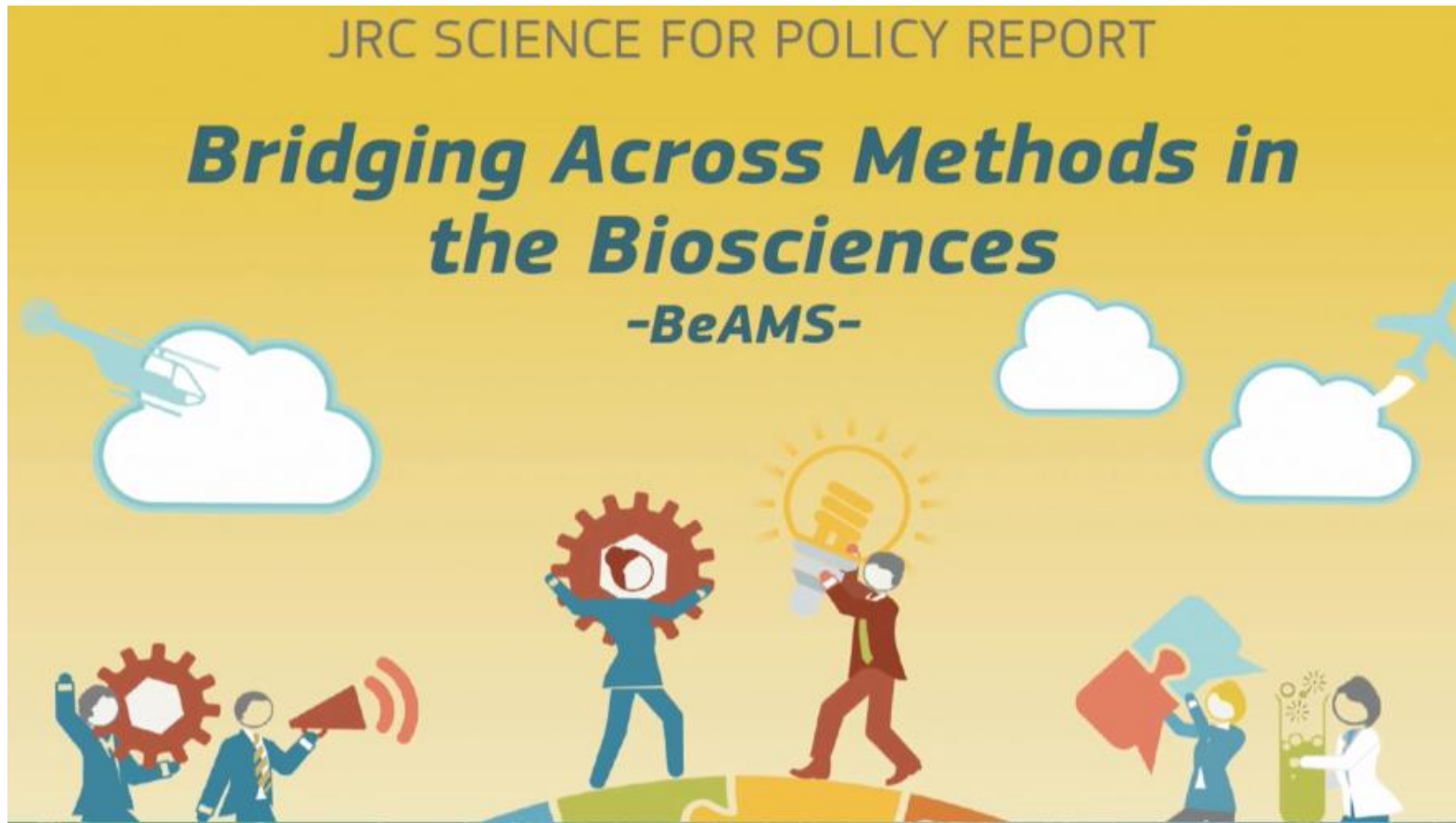
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1. Advancing non-animal methods
2. Applying them to basic research
3. Improving their relevance to human biology

A more human-based approach to science, rather than refinement of animal models





ec.europa.eu/jrc/en/news/bridging-silos-biosciences

This may be a challenge for scientists used to humanising animal models in basic research

norecopa.no/PREPARE

Better Animal Research through Open Science

Be open in several phases of your research



Webinar series



Nordic 3R webinars, 5-6 May 2021

organised by

- ArcticLAS
- Danish 3R-Center
- Finnish 3R Centre
- Finnish Centre for Alternative Methods (FICAM)
- Karolinska Institutet
- Norecopa
- Swedish 3Rs Center
- Swedish Centre for Animal Welfare (SCAW)
- Swedish University of Agricultural Sciences (SLU)
- University of Copenhagen
- University of Helsinki
- University of Oulu

norecopa.no/meetings/nordic-webinars



Danish 3R-Center
RRR

NC 3R^s National Centre for the Replacement Refinement & Reduction of Animals in Research

Utrecht University

3Rs-Centre ULS

3R Replace Reduce Refine

3 R Swiss 3R Competence Centre

3R

nc3rs.org.uk/3rs-across-europe-webinar-series-recordings



Russell & Burch
Sheringham, 1995
en.3rcenter.dk/3r/russell-burch

Coming together is a beginning

Keeping together is progress

Working together is success

Edward Everett Hale

