

1ST INTERNATIONAL SYMPOSIUM
New Prospects in
Interdisciplinary 3R
Research

18th/19th OCTOBER 2018
JUSTUS LIEBIG UNIVERSITY
GIESSEN



The 3R Centre JLU Giessen



Interdisciplinary Centre for 3Rs in Animal
Research, Justus Liebig University Giessen

ICAR3R at a glance



What does 3R stand for?

As early as 1959, William Russell and Rex Burch developed the so-called 3R concept in their book "The Principles of Humane Experimental Techniques". Scientific research according to the 3Rs concept requires a critical examination of the facts before any animal experiment is carried out. The first R stands for REPLACEMENT and demands an intensive examination of the scientific question with regard to the possibility of using alternative methods. The second R stands for REDUCTION and sets the goal of using as few experimental animals as possible. The third R represents the REFINEMENT of experimental methods and comprises all measures that contribute to keeping the potential suffering of the animal as low as possible and optimising animal husbandry.

Background

Supported by the state of Hesse, the Research Campus of Central Hesse was founded in 2016 as an alliance of the Justus Liebig University Giessen, the Philipps University Marburg and the TH Mittelhessen University of Applied Sciences (THM). The declared aim of the network is to establish Central Hesse as a region for cutting-edge research. The core element is the joint establishment and expansion of selected research fields, including lung and infection research, psychology and neurosciences as well as history and regional sciences. Part of the strategy is to strengthen animal welfare at the research site and elsewhere. At the same time, a centre for 3Rs research was established and endowed with a 3R professorship for REFINEMENT at the Department of Veterinary Medicine and a 3R professorship for REPLACEMENT at the Department of Human Medicine of Justus Liebig University. In close cooperation with the Philipps University of Marburg, the THM and the Goethe University in Frankfurt, the 3R Centre JLU Giessen aims to promote animal protection in biomedical research and drive forward concepts for the development of alternative methods and husbandry conditions in order to make a sustained contribution to the reduction of laboratory animals.

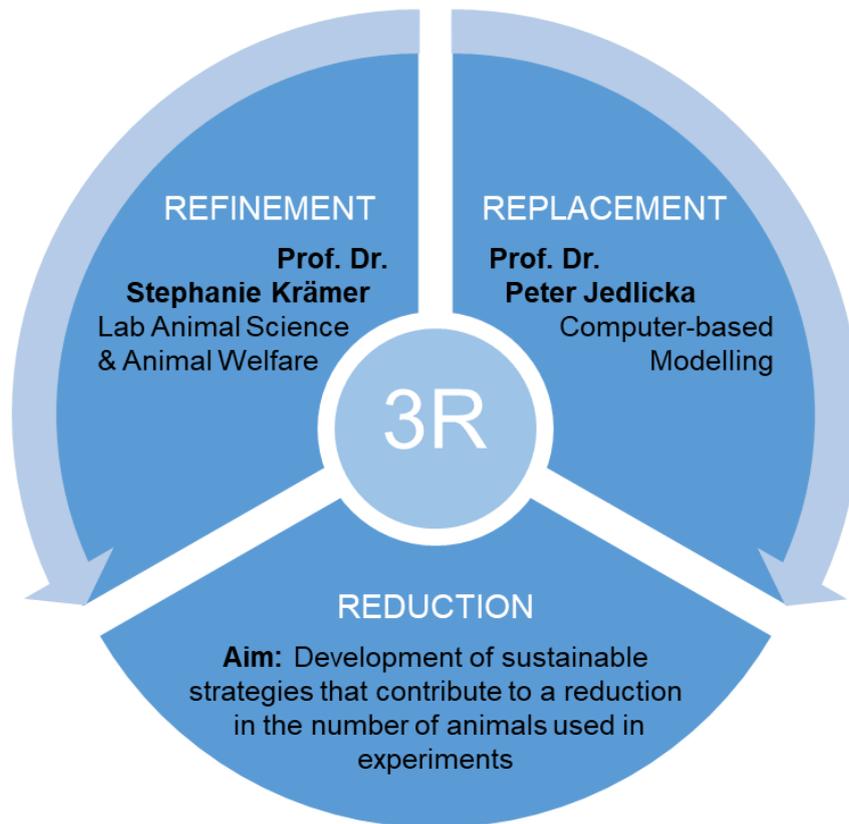
Objectives

- REFINEMENT = Refinement and improvement of test methods and husbandry conditions to minimise suffering as much as possible
- REPLACEMENT = Replacement of animal experiments with meaningful *in silico* and *in vitro* methods
- REDUCTION = Reduction of the number of laboratory animals

Due to the responsibility of scientists and institutes conducting animal experiments, it is essential that the protection of animals receives special attention in biomedical research. The use of animals for scientific purposes, which is still necessary, goes hand in hand with a moral obligation to continuously develop and make use of knowledge regarding the needs and sensations of animals. Whenever the scientific question permits, animal experiments should be replaced by alternative methods (for example by cell culture and computer models). The 3R Centre JLU Giessen not only develops its own new approaches, but also advises and connects the various scientific institutes of the Research Campus of Central Hessen with one another in order to be able to realize the set goals in a timely manner.

Organisation of the 3R Centre JLU Giessen

The 3R Centre JLU Giessen Interdisciplinary Centre for 3Rs in Animal Research Justus Liebig University Giessen	
FB 10 Veterinary medicine	FB 11 Human medicine



Location & coordination: FB 10 – Veterinary medicine
Dr. Anne Zintzsch



In addition, the 3R Centre aims to be an active contributor to the discourse on the subject of animal experiments. In the public perception, basic biomedical research in particular is in an area of tension between opposing positions. Societal developments are reflected here in the so-called human-animal relationships. The central questions are: "When are animal experiments necessary? Is it possible to tackle some scientific questions using fewer animals or no animals at all?" In cooperation with the humanities at the Justus Liebig University, the 3R Centre wants to approach the discussion from an ethical and moral perspective.

Research

In order to be able to unequivocally interpret the signs and the expressive behaviour of animals under experimental conditions, the 3R Centre considers the development of concepts to assess animal welfare (development of valid criteria) a main research objective. In some cases, these concepts define suitable parameters (in terms of metric criteria), in other cases, however, a complex interaction of behaviour-based observations and physiological attributes is necessary (in terms of parametric criteria). To this day, it is difficult to make an objective assessment of these aspects and there is still no consensus on the categorisation of pain, suffering and distress. Recommendations are to be developed which permit a

reliable welfare assessment in practice. The aim is to provide scientists, but also competent authorities, with tools that visibly contribute to the minimization of suffering in animals and, above all, to strengthening the protection of animals.

Within the scope of research and development of alternative methods for animal experiments, complex and biologically realistic computer models of cells in healthy and diseased tissue are created. The computer models are used to test scientific hypotheses *in silico* before they are tested *in vitro* (e.g. in a cell culture) or *in vivo*. To reduce the number of animal experiments, computer simulations are combined with tissue-based *in vitro* systems (e.g. organotypic slice cultures). The focus is on data-based computer models of neurons and their networks. A fast and effective transfer of knowledge and technologies is ensured by publications and the provision of the created computer models in online databases.

Interdisciplinarity

ICAR3R – Interdisciplinary Centre for 3Rs in Animal Research

The 3R Centre Giessen has now been given its own name. While in the past the 3Rs REPLACEMENT, REDUCTION and REFINEMENT were viewed relatively in isolation from one another, the structures at the Research Campus of Central Hesse provide ideal conditions to implement the true conceptual idea in the sense of Russell & Burch and to unite the three quite different approaches. The strategy pursued here lies in the cross-linking of associated scientific disciplines, that is **interdisciplinarity**. Thus not only veterinary medicine and human medicine are represented, but also the exchange with research disciplines which are not initially associated with the topic of animal experiments is sought. For example, the fields of chemistry or physics are involved in identifying suitable new materials and technologies. The highly interconnected structures of the Research Campus of Central Hessen form suitable conditions, so that ICAR3R covers a sustainable contribution to the implementation of the 3R concept of Russell & Burch.

Contact

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