

Animal Experimentation

A Guide to the Issues, Third Edition

An essential book for all those who conduct animal-based research or are involved in education and training, as well as regulators, supporters and opponents alike. This fully updated third edition includes discussion of genetically altered animals and associated welfare and ethical issues that surround the breeding programmes in animal based research. The book discusses the origins of vivisection, the advances in human and non-human welfare made possible by animal experimentation, moral objections, and alternatives to the use of animals in research. It also examines the regulatory umbrella under which experiments are conducted in Europe, USA and Australasia. The author highlights the future responsibilities of researchers who will be working with animals, and offers practical advice on experimental design, literature search, consultation with colleagues, and the importance of the ongoing search for alternatives.

Vaughan Monamy is an associate professor of Science and Science Ethics at the Australian Catholic University in Sydney. He has provided expert advice to the Australian Government's Animal Welfare and Gene Technology Ethics Committees, and has been awarded an Australian Government Learning and Teaching Citation for outstanding contributions to university student learning.

'... a succinct, accessible and balanced introduction to the controversy surrounding the use of animals in scientific research, product testing and education. ... The guide's coverage of relevant issues is international in scope ... especially suited to students planning to begin careers in the biological sciences, including as researchers, veterinarians, teachers, regulators or administrators.'

Martin Stephens, Center for Alternatives to Animal Testing, John Hopkins University

'... a "must-read" for any student or scientist involved in animal experimentation at any level.'

Michael Brands, The Physiologist

'... a thoughtful consideration of both the pros and cons of animal research ... an excellent guide to the issues [of which] current teachers of biology and biomedical science should take note.'

Asif A. Ghazanfar, Animal Behaviour

Vaughan Monamy **Animal
Experimentation**

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Third Edition



CAMBRIDGE
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University Printing House, Cambridge CB2 8BS, United Kingdom
One Liberty Plaza, 20th Floor, New York, NY 10006, USA
477 Williamstown Road, Port Melbourne, VIC 3207, Australia
4843/24, 2nd Floor, Ansari Road, Daryaganj, Delhi – 110002, India
79 Anson Road, #06-04/06, Singapore 079906

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning, and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9781107162020
10.1017/9781316678329

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First published 2000

Second edition 2009

Third edition 2017

Printed in the United Kingdom by Clays, St Ives plc, February 2017

A catalogue record for this publication is available from the British Library.

Library of Congress Cataloging-in-Publication Data

NAMES: Monamy, Vaughan, 1958– author.

TITLE: Animal experimentation : a guide to the issues / Dr. Vaughan Monamy.

DESCRIPTION: Third edition. | Cambridge ; New York, NY : Cambridge

University Press, [2017] | Includes bibliographical references and index.

IDENTIFIERS: LCCN 2016040379 | ISBN 9781107162020 (hardback : alk. paper) |

ISBN 9781316614945 (paperback)

SUBJECTS: LCSH: Animal experimentation. | Laboratory animals.

CLASSIFICATION: LCC HV49I5 .M65 2017 | DDC 179/.4–dc23 LC record

available at <https://lcn.loc.gov/2016040379>

ISBN 978-1-107-16202-0 Hardback

ISBN 978-1-316-61494-5 Paperback

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We need another and a wiser and perhaps a more mystical concept of animals. . . . We patronize them for their incompleteness, for their tragic fate of having taken form so far below ourselves. And therein we err, and greatly err. For the animal shall not be measured by man. In a world older and more complete than ours they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth.

Henry Beston (1928)

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Cambridge University Press
978-1-107-16202-0 – Animal Experimentation
3rd Edition
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Preface to the third edition

In 2000, Cambridge University Press first published *Animal Experimentation: A Guide to the Issues*. A second edition was published in 2009. It is appropriate to reflect on what has happened since then in animal research, product testing and education within the accepted ethical framework of the ‘three Rs’ principles (Replacement, Reduction and Refinement: Russell and Burch 1959). What advances, for example, have been made in the search for alternatives to the use of vertebrates in biomedical research? Are there fewer animals used in research today? Or more? Has there been a continuation of the impetus to refine experimentation with animal welfare as the priority? Answering such questions requires a thorough reappraisal of where biomedicine, product testing and education are presently placing their emphases.

Twenty-first-century technological advances have resulted in an extraordinary increase in the number of procedures involving laboratory mice in genetic and molecular research. The enormous breeding programmes required to generate heterozygous strains of mice with genetic modifications has brought to bear entirely new welfare and ethical concerns regarding husbandry and ‘surplus’ animals. Are steps being taken in Britain, Europe, North America, China, South Korea, Brazil, Australasia and elsewhere to address these concerns? Were existing regulatory frameworks adequate, or have relevant statutes been necessarily updated?

In product and chemical safety testing, a trend towards fewer animals being used in toxicological screening is emerging in some countries. In Europe, there have been legislative changes that specifically prohibit newly animal-tested cosmetic products and ingredients being sold (European Commission 2009). In the United States, a toxicology vision document (National Research Council 2007) has urged the rapid adoption of cell-based assaying and other *in vitro* methods to replace *in vivo*

testing. This has resulted in an acceleration in the uptake of *in vitro* and computer-based (*in silico*) methods with an associated reduction in laboratory animal use. Where else might such advances see a reduction in overall animal use?

Could discoveries in converging technologies such as interactive biotechnology, genome editing, synthetic biology and organ-on-a-chip biomimicry also point to a rapid replacement of animals in biological and medical research? Or will the technological advances that are making genetic alteration easier and less expensive result in a continued upsurge in animal use in experiments in these fields?

When *Animal Experimentation: A Guide to the Issues* was first written, general knowledge of computers and the internet was nowhere near as sophisticated as it is today. The acceptance of online applications such as ‘Frog Dissection’ as legitimate teaching tools has facilitated moves towards fewer classroom dissections. How widely has such smart device technology been adopted?

With such questions in mind, Cambridge University Press has published a completely updated third edition of *Animal Experimentation: A Guide to the Issues*. It is, once again, aimed at life science students, some of whom will follow careers as tomorrow’s researchers, but at the same time its clarity of style and balanced treatment will enable lay people and experts to read it with equal ease. Students and researchers will find a non-intimidating, easy-to-read and readily understood introduction to the principal issues in the animal experimentation debate.

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