



National Centre
for the Replacement
Refinement & Reduction
of Animals in Research

Skills and Knowledge Transfer grants: Pre-application webinar

Dr Katie Bates, Research Funding Programme Manager
8 November 2018

Webinar overview

- The NC3Rs remit and the 3Rs
- What is a Skills and Knowledge Transfer grant?
 - Scheme remit, what we offer, the application process, and timeline
- What makes a competitive application?
 - Demonstrating excellent science and 3Rs impact
- Case studies from our portfolio
- Useful resources

The NC3Rs remit and the 3Rs

Our remit

Any area of science, technology, engineering or mathematics that has the potential to impact on the replacement, refinement or reduction of animals in research

The primary driver of the proposal must be the 3Rs and all proposals need to offer a 3Rs impact!

Definition of the 3Rs

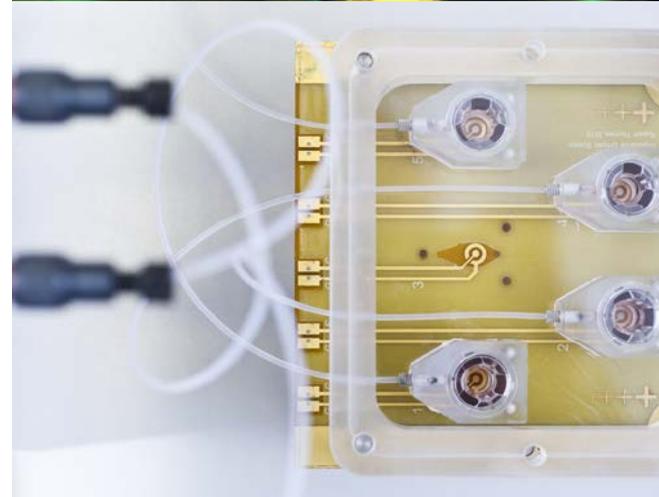
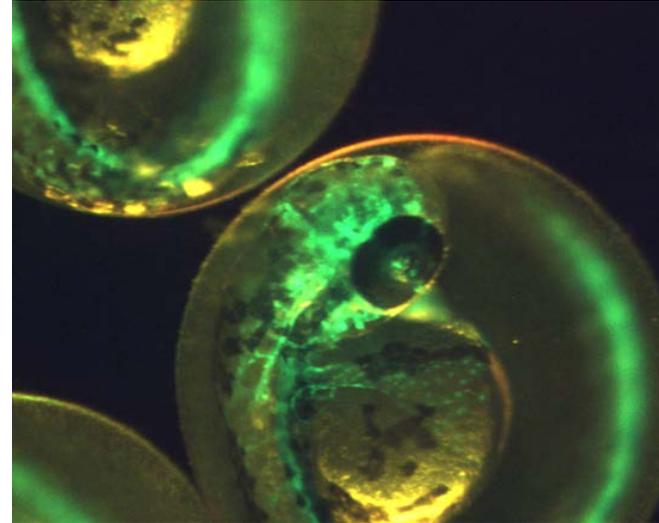
	Standard	Contemporary
Replacement	Methods which avoid or replace the use of animals	Accelerating the development and use of models and tools, based on the latest science and technologies, to address important scientific questions without the use of animals
Reduction	Methods which minimise the number of animals used per experiment	Appropriately designed and analysed animal experiments that are robust and reproducible, and truly add to the knowledge base
Refinement	Methods which minimise animal suffering and improve welfare	Advancing animal welfare research by exploiting the latest <i>in vivo</i> technologies and by improving understanding of the impact of welfare on scientific outcomes

Replacement

- Methods that avoid or replace the use of animals defined as 'protected' under the (ASPA).
- It is not replacement if the model will be used in a context where animals would not have been used anyway – e.g. due to cost or practicalities of using a large number of animals.

Examples:

- Use of invertebrate models such as *Drosophila* and *C. elegans* where there is a clear and direct replacement of vertebrate models.
- Use of non-protected immature forms of vertebrates such as embryonic and foetal forms.

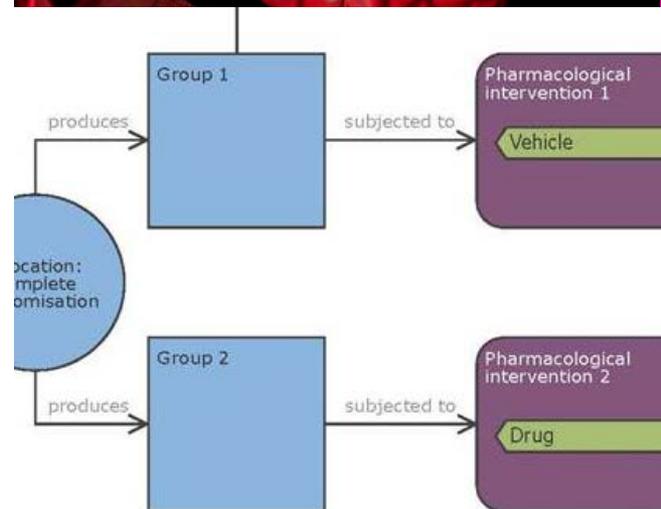
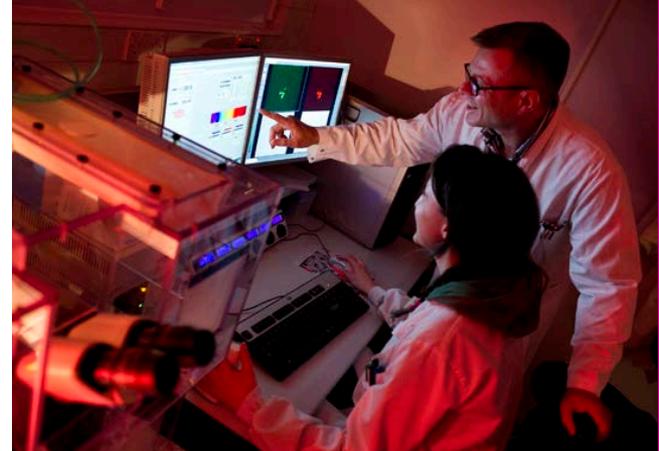


Reduction

- Methods that minimise the number of animals used per experiment or study, either by obtaining comparable levels of information from fewer animals, or by obtaining more information from the same number of animals.
- It is using appropriately designed and considered animal experiments that are robust and reproducible.

Examples:

- Imaging for longitudinal studies instead of serial sacrifice – must offer novelty, not something that is already in routine use.
- Improved experimental design to allow more data to be gathered from the same animal.

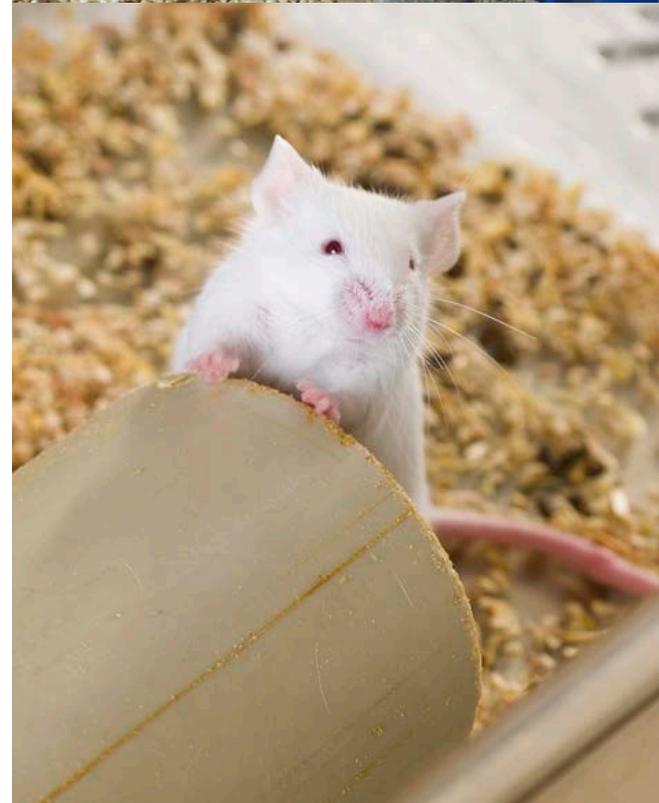


Refinement

- Methods that minimise the pain, suffering, distress or lasting harm that may be experienced by the animals.
- Applies to all aspects of animal use, from the housing and husbandry used, to the scientific procedures performed on them.
- Refinements must have the potential to deliver practical improvements in animal welfare, and cannot not just be about understanding animal behaviour or sentience.

Examples:

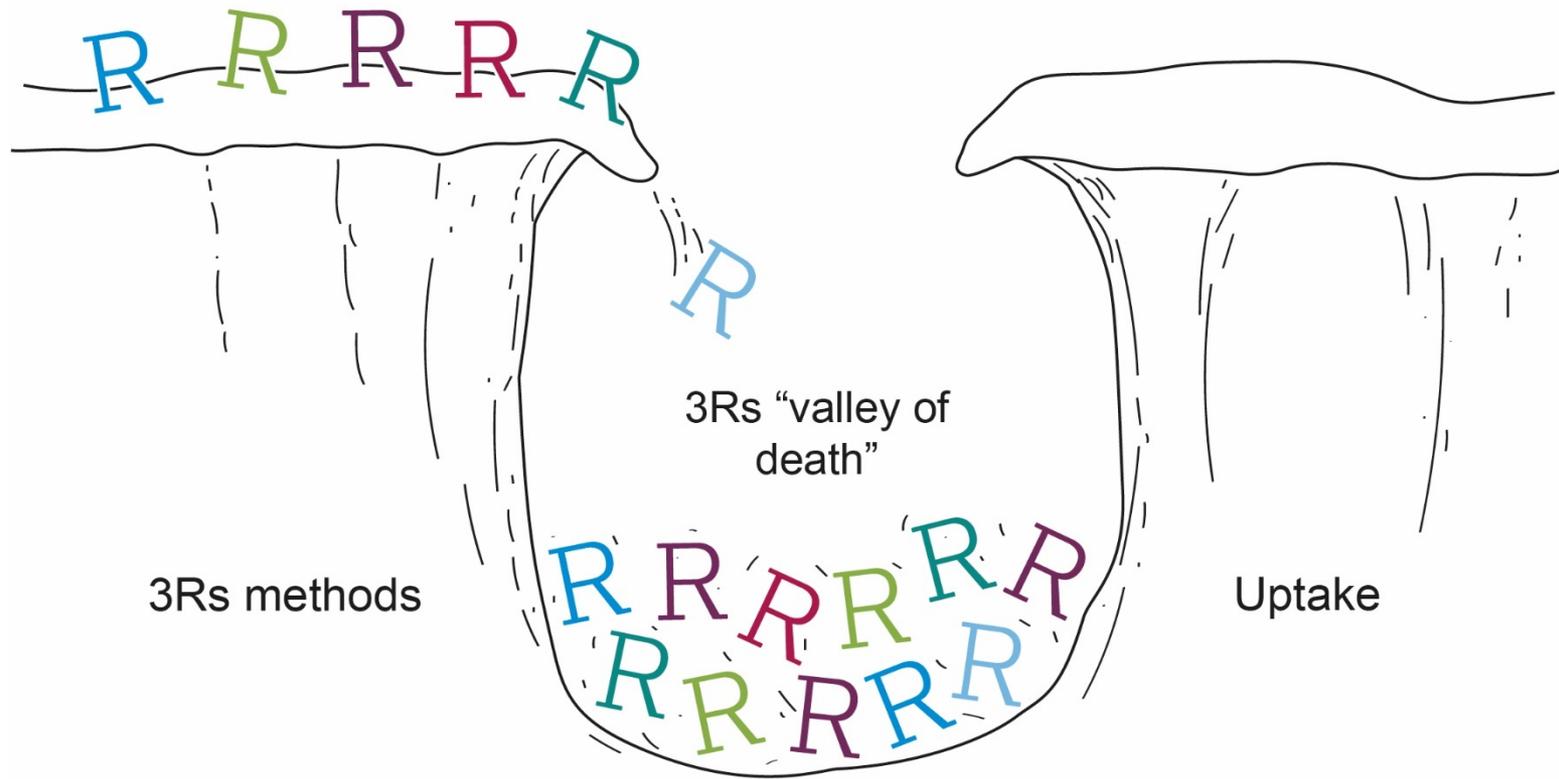
- Use of non-aversive methods for handling mice.
- Use of automated, minimally invasive home cage monitoring systems.



What is a Skills and Knowledge Transfer grant?

What we offer, the application process, and timeline

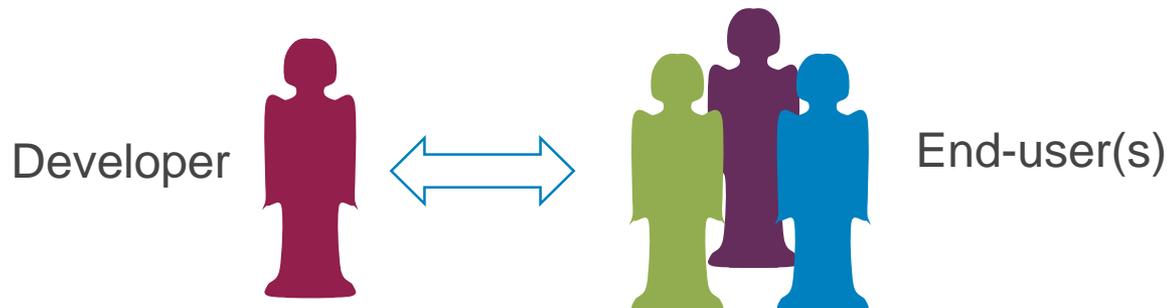
3Rs “valley of death”



The problem: Lack of awareness of, information on, confidence in, and engagement with end-users on 3Rs models and technologies

Remit of the Skills and Knowledge Transfer scheme

- Any scientific model/ tool/ technology that if transferred would deliver **immediate 3Rs impact**.
- The model/tool/technology, upon which the application is based, must be at a development stage **appropriate for adoption** by another laboratory.
- Some **validation work** to establish that the 3Rs approach is robust and reproducible in the end-user(s) lab is permitted.
- All applications to this scheme must include both the **‘developer’** and **‘end-user(s)’** of the model/tool/technology.



Skills and Knowledge Transfer grants



Supports the adoption of novel 3Rs models, tools and technologies through the transfer of knowledge, skills and expertise.

NC
3Rs



CANCER
RESEARCH
UK

Who can apply?

To apply, you must:

- **Be based at an eligible organisation:** Any UK research establishment, including HEIs, IROs and RC Institutes.
- **Be a UK-based researcher who can demonstrate that they will:** direct the proposed research, be actively engaged in accomplishing the project's aims, hold a graduate degree (a PhD is usually expected).
- Additional eligibility criteria apply for applicants wishing to apply for a joint CRUK-NC3Rs grant.

What we offer:

- **Level of funding:** Maximum of £75k (80% FEC)
- **Duration of funding:** Up to 24 months
- **Timing:** Annual competition
- **Available budget for 2018/19:** £550k (£150k ring-fenced for grants that seek to obtain 3Rs impact within the field of cancer research)

Joint CRUK – NC3Rs awards



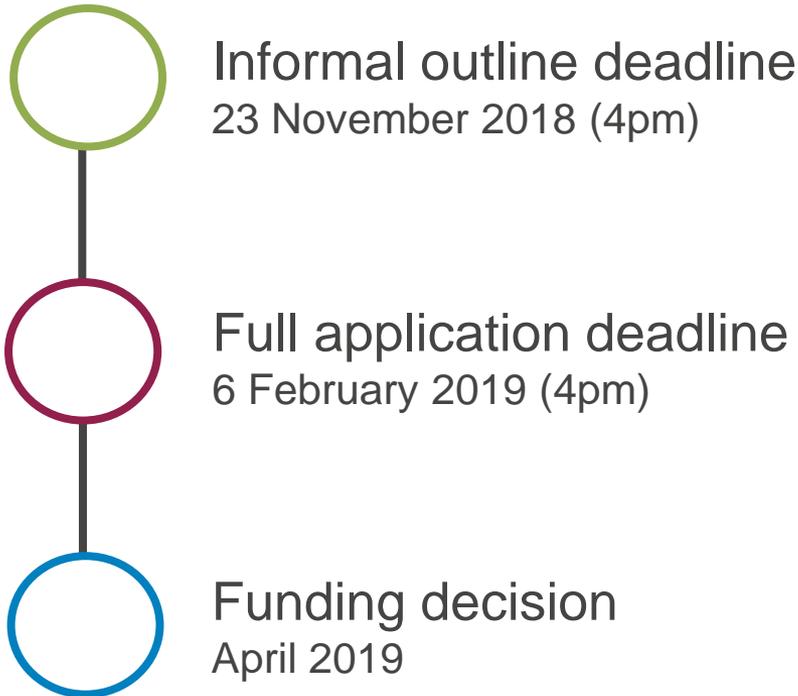
- CRUK will contribute up to £150k, in addition to the available call budget.
- Project must **seek to obtain 3Rs impact within the field of cancer research.**
- Additional eligibility criteria apply for applicants wishing to apply for a joint CRUK-NC3Rs grant.

Areas of strategic priority for CRUK:

- Basic understanding of cancer
- Early detection and diagnosis
- Therapeutic innovation and optimisation across all modalities
- Hard-to-treat cancers (brain, lung, oesophageal and pancreatic)
- Precision medicine
- Cancer prevention

Application process and timeline

Key dates 2018/19:



- Submit via email, assessed by the NC3Rs office for eligibility and remit.

- Shortlisted applicants will be invited to submit a full application via Je-S.
- Application forms available on Je-S from 12 December 2018
- No external peer review, applications will be assessed by the Skills and Knowledge Transfer Assessment Panel.

Assessment criteria used by the Panel

The following criteria are taken into consideration when making the funding decisions:

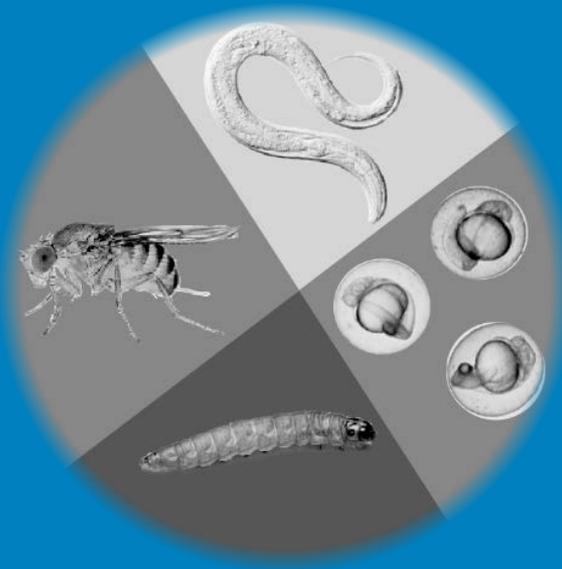
- Potential impact on the 3Rs at both a local and international level
- Quality of the science for which the model/tool/technology is being used
- Quality of skills transfer plan
- Expertise and track record of the team
- Risk management strategy
- Value for money
- Strategic relevance to the highlight notice (where appropriate)

NC3Rs scoring matrix

- The Panel score on a 1 – 10 scale
- Applications are scored using a matrix which considers both the 3Rs and the science and/or technology development.

SCIENCE AND SKILLS TRANSFER	POTENTIAL 3Rs IMPACT				
	Exceptional	Excellent	Very Good	Good	Not competitive
Exceptional	10	9	8	7	5
Excellent	9	8	7	6	4
Very Good	8	7	6	5	3
Good	7	6	5	4	2
Not competitive	5	4	3	2	1

2019 Highlight Notice for 2018/19



www.nc3rs.org.uk/funding-scheme-priority-areas

Aims and remit of the Highlight Notice:

- Facilitate research partnerships between mammalian model and non-mammalian, multicellular model users.
- Encourage the development of new and innovative non-mammalian models.
- Build confidence in established non-mammalian models by supporting the transfer of them to mammalian model laboratories.
- Reduce the reliance on mammalian models.

Which non-mammalian models are in remit?

- The highlight notice is limited to the following model systems:
 - Zebrafish embryos and larvae
 - *Drosophila*
 - Nematodes (e.g. *C. elegans*)
 - *Galleria mellonella*

Potential applicants are advised to contact the Office before submitting an application under this highlight notice.

What makes a competitive application?

- Demonstrating reproducibility of the science for which the model/tool/technology is being used and the translatability and quality of the proposed skills transfer plan
- Demonstrating 3Rs impact

Science and transfer plan



The 3Rs approach must be at a development stage appropriate for adoption by the end-user(s).

Some validation work is permitted.

Points that should be addressed:

- What is the **transferability** of the 3Rs model/ tool/ technology?
- What is the **translatability** of the 3Rs model/ tool/ technology?
- What are the **barriers to adoption** and how can these be overcome? (e.g. access to human tissue/data/specialist equipment)
- What measure(s) of success/ acceptance tests will be used by the 'adopter(s)' of the 3Rs model/ tool/ technology to demonstrate that it is **fit for purpose**?
- Demonstrate the likelihood of **successful delivery** (timeline/milestones realistic and risks well managed)
- What are the **immediate** and **deliverable 3Rs impact(s)**?

Environment, people and track record



It is essential to demonstrate the expertise and capability of the team to carry out the proposed work.

Points that should be addressed:

- Are the **roles** of both the ‘developer’ and ‘end-users’ **clearly described**?
- Does the team have experience in **communicating** and **disseminating** scientific research?
- Provide a detailed **dissemination plan** that will help drive further uptake of the 3Rs model/ tool/ technology in the wider target community (academic and/ or industry).
- Do you have convincing **letters of support** that demonstrate the tangible ways the 3Rs model/ tool/ technology will be shared/ welcomed into the lab/ institution/ organisation?

Routes of dissemination



Demonstrating 3Rs impact

A well-articulated 3Rs case is crucial to success!

The 3Rs impact case

1. Which of the 3Rs will the proposed research advance?
2. How are you advancing the 3Rs?

Be specific:

- **What species of animal will be affected?**
 - Which species is currently used for this type of work?
 - Could the proposed method impact other species as well?
- **What type of animal procedures will the proposed research have an impact on?**
 - Will this affect all models, a certain model, or a specific aspect of a model?
 - Could it affect the severity limits of procedures/models?
 - Could it impact other similar models in use/ research outside of your area?

3Rs metrics

We are looking for reasonable and realistic estimates based on a logical approach.

We are not looking for:

- Exaggerated numbers or sweeping statements.
- Broad generalisations, such as Home Office statistics.
- Arbitrary percentages/numbers – back up your metrics with logical workings.

Metrics can be based on:

- How many animals are used locally for this work, and how many would be affected/no longer used
- How many groups in the UK/ overseas use the animal model and could benefit from the approach
- How many papers published annually use this model, and how many animals are used in a typical publication

Example of a weak 3Rs impact case

‘According to the UK Home Office in 2014, 130,000 animals were used in basic oncology research and a further 60,000 in translational or applied human cancer research. The vast majority of the animals used in these procedures are mice. We believe our *in vitro* system can replace the use of mice in 20% of such research in the UK, equating to millions of animals worldwide.’

Example of a stronger 3Rs impact case

‘In our laboratory we use 1000 mice annually in this procedure which is classified as severe by the Home Office. Using our new method we can replace 50% of our animal work and use only 500 mice. We know of 5 other groups in the UK who use this model. Assuming they use a similar number of mice to us, our model could replace 3000 mice annually in the UK. A PubMed search shows there are 100 papers published each year that use the animal model. Each paper typically uses 200 animals. If our method was adopted we could replace 50% of this use – equating to a further 10,000 mice internationally that would no longer be used in a severe procedure.’

Case studies from our portfolio

Reduction and refinement case study

Dissemination of refinements in mouse experimental stroke models to the scientific community

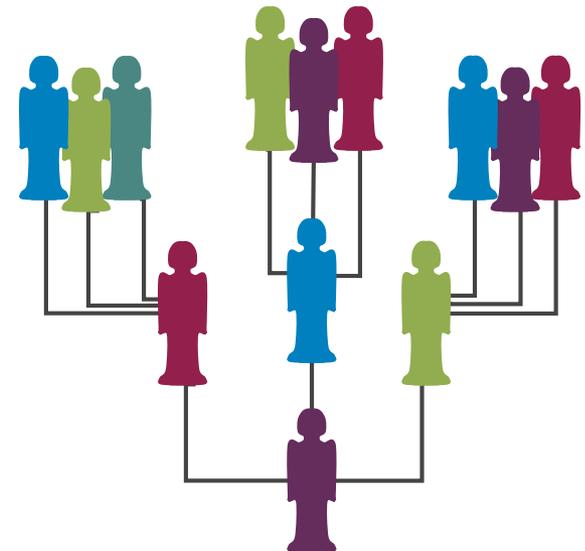
- Previously developed and validated a refined model of experimental stroke in mice which offers improved welfare and allows for fewer animals to be used per experiment because of the reduced variability in lesion volume.
- The aim of her award was to facilitate the uptake of this refined model within the international experimental stroke community.
- Three key research groups from the UK, Germany and USA have been trained in the refined surgical approach, and they will now act as training hubs for international researchers.
- Working on a JoVE publication, provided training to an additional lab, secured further funding to host a local workshop to help promote further uptake.



Dr Claire Gibson



UNIVERSITY OF
LEICESTER



Replacement case study

Transfer of a non-human primate (NHP) *in vitro* functional assay for the early evaluation of TB vaccine candidates and the associated immune response

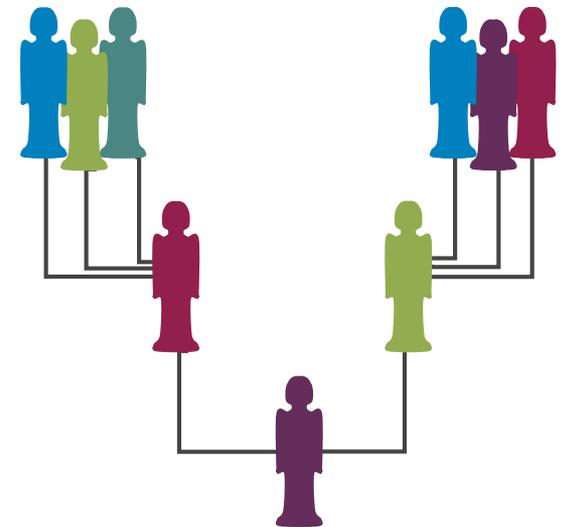
- This project successfully transferred the novel *in vitro* assay for the early evaluation of tuberculosis (TB) vaccine candidates to Public Health England and the Biomedical Primate Research Centre in the Netherlands.
- Adoption of this approach has led to local replacement of the non-human primate, mouse and guinea pig 'challenge' models currently used in TB vaccine development.
- Hosted a training workshop at the TBVAC2020 annual meeting.
- Established 11 new worldwide collaborations.
- Resulted in two publications and secured a two-year VALIDATE fellowship.



Dr Rachel Tanner



UNIVERSITY OF
OXFORD



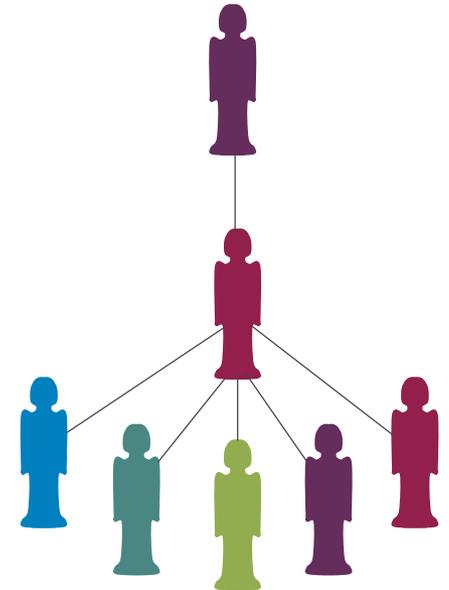
Replacement case study

High-throughput *in vitro* culture system for *Cryptosporidium* oocysts: replacing animals in research

- Via a transatlantic exchange, this project successfully brought to Europe a novel high throughput *in vitro* culturing system for the enteric parasite *Cryptosporidium*.
- The set-up of this alternative system ensures that Professor Cable's group and her network of European collaborators have a continuous supply of *Cryptosporidium* oocysts, replacing the need for calf and mouse infection models of *Cryptosporidium* propagation.
- Popularised the method via a poster presentation and workshop at the annual British Society for Parasitology meeting, has led to 3 new collaborations.
- Secured a COFUND fellowship, a Global Challenges Research Fund project and 2 PhD studentships.

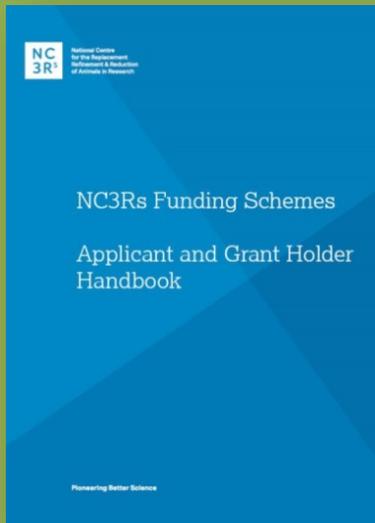


Professor Joanne Cable



Useful resources

Useful links and resources



- Skills and Knowledge Transfer grants scheme homepage: www.nc3rs.org.uk/skills-and-knowledge-transfer-grants
- Explore the research we've funded: www.nc3rs.org.uk/our-science
- Applicant handbook: www.nc3rs.org.uk/sites/default/files/documents/Funding/Handbook.pdf
- Resources to help you write a competitive application:
 - www.nc3rs.org.uk/how-make-successful-grant-application
 - www.nc3rs.org.uk/write-effectively-about-3rs
 - www.nc3rs.org.uk/news/eleven-ways-your-funding-application-could-be-failing
- Experimental Design Assistant (EDA): www.nc3rs.org.uk/experimental-design-assistant-eda



National Centre
for the Replacement
Refinement & Reduction
of Animals in Research

Further information – we're here to help!

For more information

✉ 3rsgrants@nc3rs.org.uk

🏠 www.nc3rs.org.uk

📘 www.facebook.com/NC3Rs

🐦 [@NC3Rs](https://twitter.com/NC3Rs)

Keep in touch

Our monthly newsletter provides the latest updates from the NC3Rs, including funding calls and events www.nc3rs.org.uk/register

Pioneering Better Science

NC3Rs National Centre for the Replacement Refinement & Reduction of Animals in Research

Newsletter
July 2018

Announcing our 2019 highlight notice

To encourage funding applications relating to areas of strategic importance to the NC3Rs, we issue regular highlight notices that apply across our funding schemes. Our 2019 highlight notice will support the development or transfer of innovative applications of non-mammalian organisms by facilitating new partnerships between rodent and non-mammalian model organism users.

▶ [Further information](#)