

New Approach Methodologies (NAMs)  
Funding and Regulation: Does One Pose a Greater  
Threat to Advancement?



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YOU-WC11 Workshop: “Challenges & Opportunities for expanding the 3Rs”

11<sup>th</sup> World Congress on Alternatives and Animal Use in the Life Sciences, 30<sup>th</sup> August 2021

The Lush Prize-brief overview;

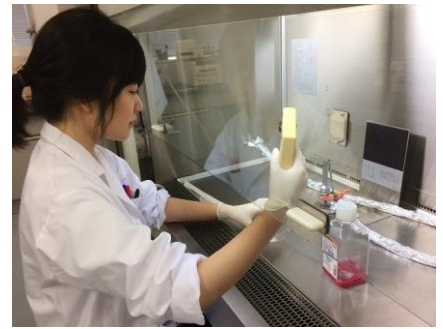
How lack of funding of New Approach Methodologies (NAMs) is impeding scientific progress;

How institutionalized bias favours animal research;

The responsibilities of funding bodies to advance NAMs through improving funding and transparency;

Positive change: current efforts to overcome this barrier;

Conclusions



# What is the LUSH Prize?

- A global prize fund to support initiatives to end or replace animal testing
- 2.8 million EUR awarded since launch in 2012
- Rewards outstanding work in five categories:
  - Science
  - Training
  - Lobbying
  - Public Awareness
  - Young Researchers
- Urgent need to fund replacement of animal tests with more scientifically valid, human-relevant alternatives; 'New Approach Methodologies' (NAMs)
- Focus on '1R' - replacing animal use in safety (toxicity) testing & biomedical research



The Lush Prize-brief overview

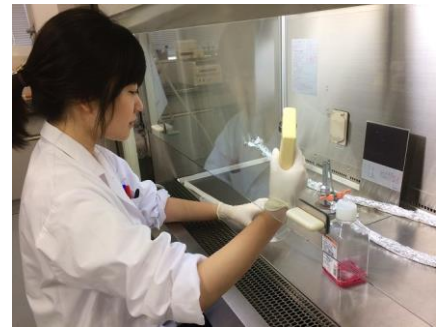
## **How lack of funding of NAMs is impeding scientific progress**

How institutionalized bias favours animal research

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# Lack of funding of NAMs is impeding scientific progress

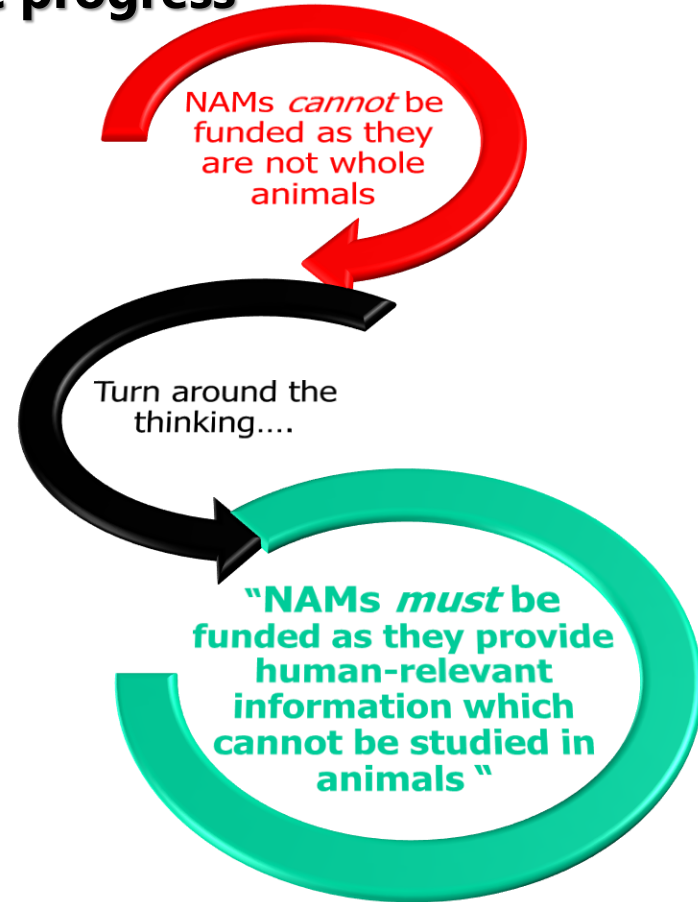
Current testing & research strategies- 'fit for purpose'?

Sector	Industrial chemicals	Pharmaceuticals
Problem	Chemical safety testing- animal models considered inefficient to keep pace with high volume chemical assessment	86-90% fail clinical (human) trials after being considered successful in pre-clinical tests, largely based on animal studies
Consequences	<ul style="list-style-type: none"><li>• 'Big unknown' on total industrial chemical numbers worldwide</li><li>• Thousands of substances still raise concerns over insufficient or unknown safety data, despite large scale testing regulations</li></ul>	<ul style="list-style-type: none"><li>• Many diseases still lack effective treatments/cures</li><li>• Pharma pipeline attrition</li><li>• Costs  vs Products (New Medical Entities) </li><li>• How many potential new treatments overlooked due to 'false positives' in animals?</li></ul>

# Lack of funding of NAMs is impeding scientific progress

- Significant underfunding of NAMs to date;
  - Direct**- Lack (or expiry) of funding prevents NAMs entering the validation and approval process
  - Indirect** – Majority funding continues for animal models which lack human relevance
- EU funding of alternative ('3Rs') methods very low ; between **0 - 0.036%** of member state annual budget <sup>1</sup>
  - Total EU '3Rs' spend (2013) = € 18.7 million
  - Provided by only seven countries ; Austria, Belgium, Denmark, Finland, Germany, Sweden, UK <sup>1</sup>

1. Taylor, K. (2014) EU member state government contribution to alternative methods. ALTEX 31, 2/14



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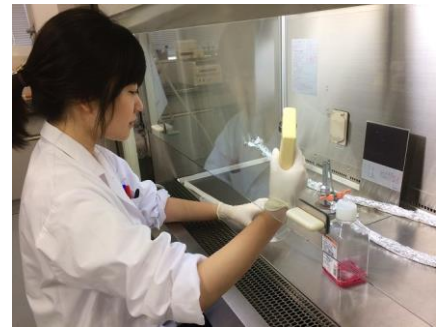
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# How institutionalized bias favours animal research

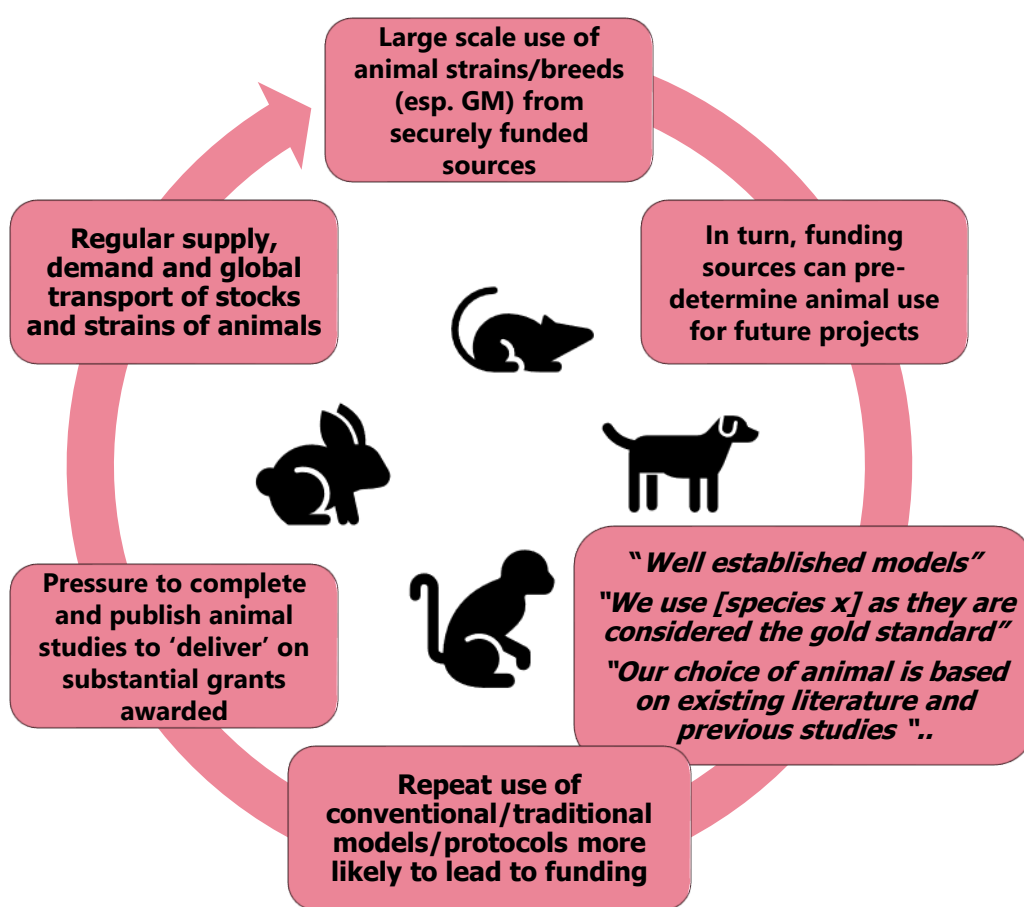
- Global investment in biomed research per year- **est \$100 billion**; large proportion to animal research
- e.g. UK research and development spend (2017) - **£34.8 billion**, of which 40% was for basic research which uses a greater number of animals than any other research category <sup>1</sup>
- e.g. US Nat Inst. Of Neurological Disorders & Stroke
  - 70% of funded projects involve animals
  - Stroke remains a major unmet need in human medical research
  - Decades of poor predictivity in animal models <sup>2</sup>
- Lack of transparency on exact funds allocated to animal research

<sup>1</sup> [Accelerating the Growth of Human Relevant Life Sciences in the United Kingdom: A White Paper by the Alliance for Human Relevant Science](#)

<sup>2</sup> Pound P, Ram R. 2020. Are researchers moving away from animal models as a result of poor clinical translation in the field of stroke? An analysis of opinion papers. *BMJ Open Science* ;4:e100041. doi:10.1136/ bmjos-2019-100041



# How institutionalized bias favours animal research



- 'Lock in'<sup>1</sup> of use of animal models
- 'Lock in' of funding sources may mirror 'lock in' of animal use in academia
- Animal research is an industry

1. Frank J, lock-in T. Technological lock-in, positive institutional feedback, and research on laboratory animals. *Structural Change and Economic Dynamics* 2005;16:557–75

# How institutionalized bias favours animal research

**Retrospective assessment (RA)** of animal projects according to EU directive 2010/63/EU (Protection of Animals for Scientific Purposes);

- Member states can decide if an animal research project should be retrospectively assessed to check;
  - (a) whether the objectives of the project were achieved;
  - (b) the harm inflicted on animals, numbers & species of animals used, and severity of the procedures; (classified as Mild, Moderate, Severe or Non-Recovery)
  - (c) any elements that may contribute to the further implementation of the requirement of replacement, reduction and refinement ('3Rs')
- All projects involving non-human primates and any project classified as 'Severe' harm must undergo RA
- **However** not all member states choose to adopt and report on this part of the directive
- ***In reality, relatively few projects are retrospectively assessed;***

E.g. UK - Of 235 animal research applications (Jan-Jun 2020) , only 43 to be RA (18%)  
(including only 1 project relating to COVID-19 or coronavirus (from a total 11 projects))

Similar (poor) rate across EU

# How institutionalized bias favours animal research

- Convention vs Science

*“[Importance of] ...dissemination of alternative methods, especially among younger researchers because there is still the belief that the use of animals is the gold standard in research”*

- Requests to ‘validate’ NAMs in animals – major hurdle

*“none of the teachers cared to talk about the alternatives to animal products and models...”*

- High concern of overstatement of benefits

*“...holdbacks are primarily due to a lack of information and financial resources...”*

- Misperception that NAMs ‘at best’ complement or reduce use of animal models, but cannot replace them

*“ ...disappointment at the request to perform our successful in vitro model in animals...”*

- Bias within peer review and publication process

*“I come up against barriers in trying to avoid the use of animals in my work. ...it’s difficult to obtain human tissue for study without data on animal testing... ...it’s difficult to get research funding ...where the majority of researchers believe that animal testing is scientifically the most relevant to assess safety ..”*

*“90% of publication reviewers are animal researchers with vested interests. If you say a mouse model is invalid, you are attacked...”*

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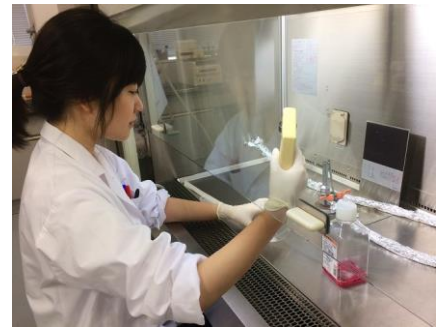
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# The responsibilities of funding bodies to advance NAMs through improving funding and transparency

Discussion with government & regulatory agencies ;

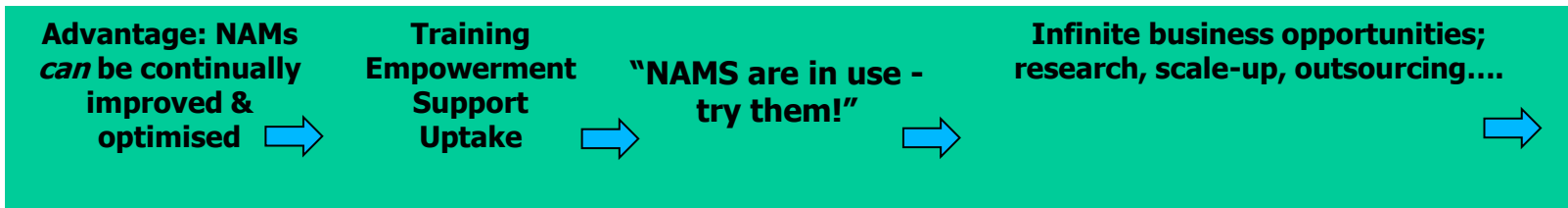
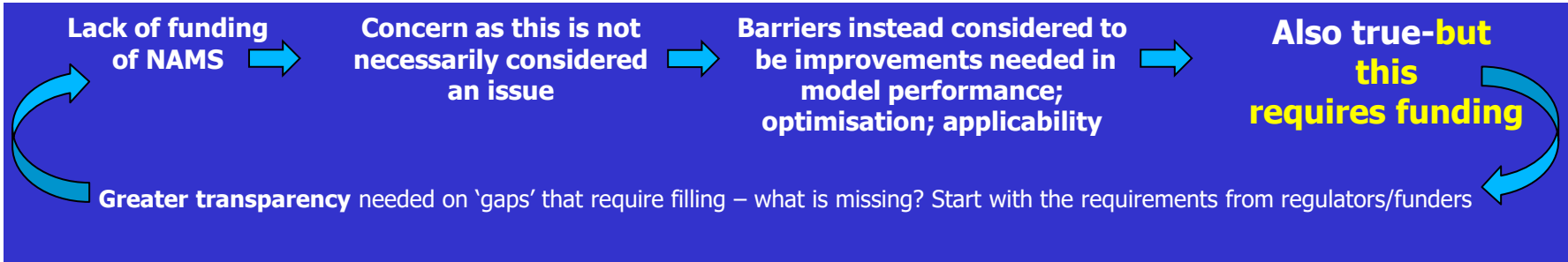


Image credit: Accelerating the Growth of Human Relevant Life Sciences in the United Kingdom: A White Paper by the Alliance For Human Relevant Science

# The responsibilities of funding bodies to advance NAMs through improving funding and transparency

- **Diversification** of funds from animal models to NAMs
- More attractive and pragmatic than 'increasing' funds
- Government action will achieve benefits for all;
  - Business opportunities, jobs, agency initiatives
  - Training & Support, infrastructure
  - **'Time it right'** -start early career researchers on the NAMs roadmap;
  - NAMs 'in hands' from basic /'blue sky' research stage to introduce methods, increase confidence, wider acceptance and greater influence when regulatory phase is reached
  - Increase the new generation knowledge base in NAMs to achieve scientific transition;
- Deployment of NAMS to ultimately **save** money; replacing animal tests with NAMs- up to 90% cost saving per test <sup>1</sup>

1. Meigs L, Smirnova L, Rovida C, Leist M, Hartung T. Animal testing and its alternatives - the most important omics is economics. ALTEX. 2018;35(3):275-305.

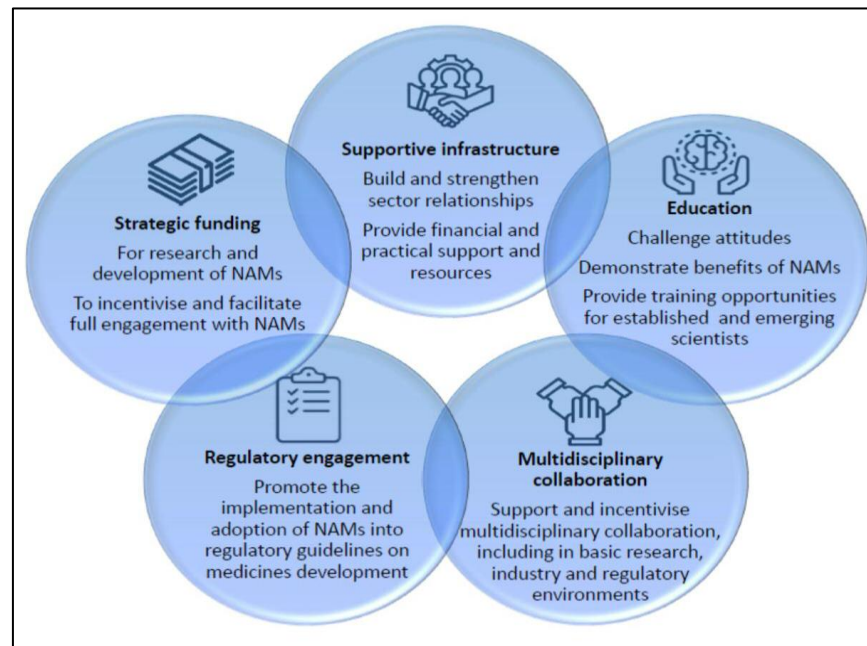


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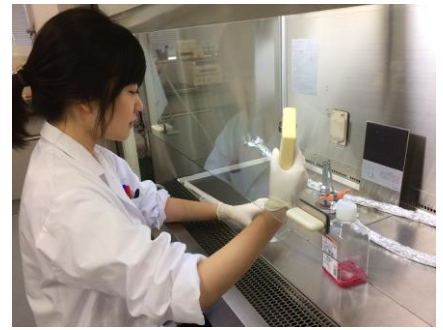
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# Positive change; current efforts to overcome this barrier

## Early career scientists @Lush Prize

**Ever increasing demand** for funding of early career scientists; 50% increase in applications year on year

**Exciting** Young Researcher initiatives e.g. Asia, South America

**Greater recognition and acceptance** of their work in research, training and education in NAMs

**Breaking new international ground** to encourage researchers and campaigners, provide support and aid acceptance of their work

**Funding NAMs research** in areas where gaining support is difficult or refused <sup>1</sup>



1 Ram R. 2015. Young researchers--the ethical challenge. Altern Lab Anim 43(6):P72-7.



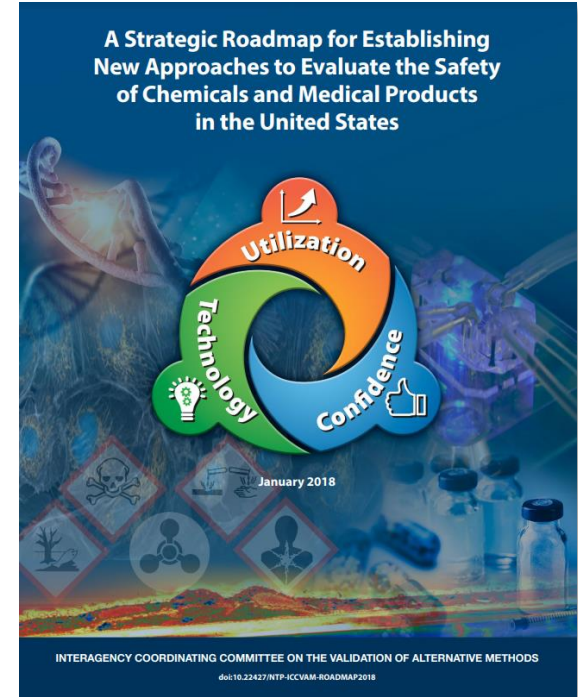
# Positive change; current efforts to overcome this barrier

## Wider picture- some examples;

- US Environmental Protection Agency (EPA ) 2019 ; \$4.25 million for methods that reduce, refine and/or replace vertebrate animal testing, aiming to eliminate all requests and funding for studies using mammals by **2035**
- US Food & Drug Administration (FDA) multi-year research and development agreement to test Organ on a Chip technologies <sup>1</sup>
- Netherlands Government & Society collaboration to accelerate transition to NAMs (Transition Programme for Innovation- TPI) <sup>2</sup>
- Ongoing work by ICCVAM – Interagency Coordinating Committee on the Validation of Alternative Methods
- EU: Ongoing outreach & resources by JRC ECVAM (European Centre for the Validation of Alternative Methods)
- Numerous Roadmaps to advance progress in New Approach Methodologies

<sup>1</sup> FDA Researchers to Evaluate 'Organs-on-Chips' Technology | FDA

<sup>2</sup> <https://www.transitieproefdiervrijinnovatie.nl/english/partners-behind-tpi>



## Positive change; current efforts to overcome this barrier

- Exponential growth of *in vitro* and *in silico* technology markets;

“ NAMs *are* being used - try them”

Popular conference topic!  
People want NAMs 😊



# Positive testimonies on NAMs funding and outreach

*“....visibility for research on alternative methods in Brazil. ...For the education field, it is very important, because more students know about researches on humane education and they come to ask for information....encouraging new techniques of education, focusing on toxicity testing in the 21st century”*

*“...recognition for the work our group has done, it has assisted us to be a stronger force .... a huge boost for us financially, and has given us corporate support for an important ethical issue, despite the vested interests that we are faced with on a daily basis”*

*...very important in recognising our work and convincing others to replace animals”*

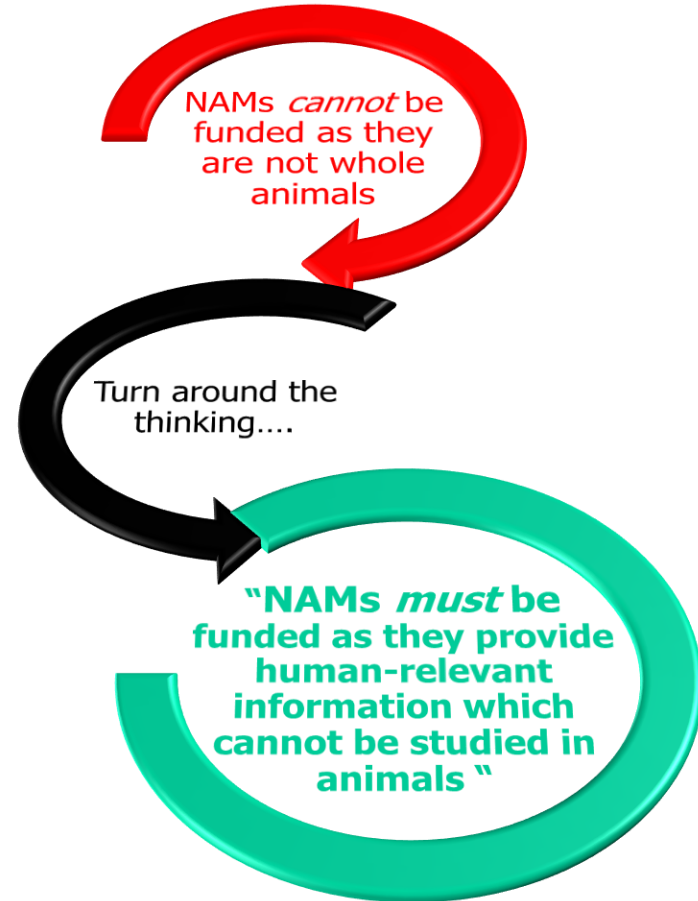
*...not only funded my research but allowed me to engage in partnerships and keep on devoting my career to replacement methods...*

*..endorse our work with both political and scientific communities in India. Piece by piece,we are moving towards the removal of all animals from laboratories”*

## Conclusions/Take Home Messages

- Encouraging progress under way, but still a 'drop in the ocean' compared to ongoing global funding of animal research
- **Wholesale government action is needed, driven by;**
  - **Political lobbying**
  - **Scientific innovation**
- Infinite business opportunities are provided by NAMs for research, scale up, outsourcing, training, deployment etc.
- Call to action to **divert** funding into NAMs to ultimately save money & improve research
- Young Researchers: '*Don't ask, don't get..*' - indicates to potential funders/sponsors your interest in NAMs research
- 'The tide is turning' – next 10 years..?

**Lush Prize opens for nominations in Spring 2022**



**Thank You for listening!**

**Questions?**

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**[www.lushprize.org](http://www.lushprize.org)**