

THE 3RS

Should we stick to the basics? Or should we advance to a contemporary viewpoint surrounding the 3Rs?

Replacement

Basic (Russell & Burch, 1959)

The substitution for conscious living higher animal of insentient material.

Contemporary (MacArthur Clark, 2018)

Accelerating the development and use of tools relevant to the target species (usually humans) based on latest technologies.

Refinement

Basic (Russell & Burch, 1959)

Decrease in the incidence or severity of inhumane procedures applied to those animals which still have to be used.

Contemporary (MacArthur Clark, 2018)

Employing new in vivo technologies that can benefit animal welfare and science including methods to minimise pain and distress as well as to deliver enhancements in animal care, housing, handling, training and use.

Reduction

Basic (Russell & Burch, 1959)

Reduction in the number of animals used to obtain information of given amount and precision.

Contemporary (MacArthur Clark, 2018)

Using appropriately designed and considered animal experiments that are robust and reproducible.



The 9Rs

(Chelouitte-Nieves & Lipman, 2020)

Repeatability

Replicability

Reproducibility

Registration

Robustness

Reporting

Refinement

Reduction

Replacement

Final Thoughts

- We should advance to a contemporary viewpoint!
- Original definitions do not account for scientific value nor responsibility
- Replacement places a hierarchy on life
 - How do we know what is more conscious, if there are no comparative studies conducted?
 - We can use technology!
- The definition of refinement needs to change to encompass evolving techniques, technologies and findings
 - Modern non-invasive imaging methods without euthanizing
 - Micro-sampling allows for smaller blood samples
 - Proper handling methods
 - Improving quality of certain aspects can lead to better welfare
- Reduction does not necessarily lead to more ethical practice
 - Using too few animals can result in statistically unreliable results
 - More humane to use more animals to ensure each individual has less harm
 - Balance is key!