



THE 3RS OF ANIMAL RESEARCH



WHAT ARE THE 3RS?

A set of principles defined by Russell and Burch to guide more humane animal research that advances science and medicine



REDUCTION



Improving research studies to ensure the fewest number of animals are involved while collecting the necessary data

Scientists develop new research protocols and use statistical methods to minimize the number of animals while maximizing the data attained. In addition, regulatory boards oversee experimental design to ensure only the required number of animals are involved.



REFINEMENT



Positively impacting the well-being of animals in research and minimizing or eliminating potential pain or distress

Veterinarians, laboratory technicians, and scientists work together to provide research animals with enhanced living environments and opportunities to engage in species-typical behavior and socialization. They also identify and treat any potential pain or discomfort experienced by the animals.

REPLACEMENT



Using computer, cell, and organelle models in place of living organisms to answer research questions.



Scientists and engineers can leverage what we know about living systems to develop non-animal models for testing hypotheses and diving into specific areas of research.

WANT TO LEARN MORE?

Read our article on how the 3Rs have informed ethical animal research on The Conversation!

