

Examples of 3 Rs Keywords for Alternatives Literature Searches

(lists are not inclusive)

I. NIH Searching for Alternatives to Painful Procedures Used on Research Animals <http://nihlibrary.ors.nih.gov/training/AlternativesSearchTipSheet5-24-04.pdf>

Place the truncation symbol where the parentheses () are to get variant endings of terms in a specific database.

Commonly used truncation symbols:

Ovid = dollar sign (\$) or colon (:)

disease\$ or **disease:** retrieves disease, diseases, diseased, etc.

Science Direct = exclamation point (!)

behav! finds behave, behavior, behavioral, behavioural, behavioural, etc.

PubMed = asterisk (*)

bacter* finds bacteria, bacterium, bacteriophage, etc.

Reduction and Refinement

advers()
anesthe(), anasthe(), anaesthe()
anxiolytic restrain(), restrict(), immobil()
assay()
cag()
device()
distress()
educat()
enrich()
euthanasia)
euthanize()
handl()
hous()
instruct()
method()
monitor()
pain()
positive reinforce()
procedur()
reduc()
refin()
stress()
teach()
technique()
train()
tranquiliz()
welfare

Replacement

alternative()
animal testing alternative()
animal use alternative()
assay()
bacter()
cadaver()
cephalopod()
culture() (cell, tissue, organ)
fish()
invertebrate()
isolated (cell, tissue, organ)
mannequin() or manikin()
method()
model()
replac()
simulat()
software, computer()
technique()
train(), educat(), teach(), instruct()
video()
virtual (surgery, reality)
vitro (method, model, technique)

II. University of Pennsylvania IACUC Guideline 18 - Literature Search for Alternatives - keywords

<http://www.upenn.edu/regulatoryaffairs/animal/guides/18LitSearch012206.pdf>

A. Replacement

Alternative	Animal	Species
Model	Rodent / Mouse / Rat	Digital
In-Vitro	Sheep / Ovine	Artificial
Invertebrate	Dog / Canine	Computer
Cadaver	Pig / Swine / Piglet	Culture
Carcass	Cat / Feline	Virtual
Mannequin	Fish	Assay

B. Refinement

Tracheotomy	Craniotomy	Train
Euthanasia	Pain	Teach
Distress	Retro-orbital bleed	Analgesics
Anesthesia	Decapitation	Restraint
Surgery	Thoracotomy	Deprivation
Femoral Cut Down	Humane Endpoints	

C. Reduction

Pilot Study	Contract Company	By-Products
Animal Vendors	Biotechnology	Surgical Services