Systematic Reviews of animal studies equal the implementation of the 3Rs

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What is a systematic review?

• **Systematic review (SR)**
  - literature review
  - focus on a single question
  - to identify, appraise, select and synthesize evidence
SYstematic Review Centre for Laboratory animal Experimentation
SYRCLE activities

- Workshops
- Coaching
- E-learning
- Execution
- Tools and guidelines
- www.syrcle.nl
SRs lead to

- A more evidence-based choice of animal models
  van Drongelen, Am J Physiol Heart Circ Physiol 2012
  De Vries RB, Tissue Engineering Part B 2012
  Sloff M, PloSOne 2014
  Zeeff SB, Inflammatory Bowel Dis 2016

- More translational transparency
  Hooijmans CR, PloSOne 2012
  Vesterinen HM, Mult Scler 2010
  Howells DW, Int J Stroke 2012

- Implementation of the 3Rs - examples
Replacement

- New information is derived from already published data, without doing new animal studies
- Dutch think-tank: SRs are an animal-free innovation
Analgesics and metastases

Hooijmans, Pain 2015
Reduction

- Knowledge gaps are made transparent
- Quality of reporting is made transparent
- Superfluous studies are made transparent
- Prevention of unnecessary duplication
Cumulative MA

Sena 2010
Intestinal anastomosis models

- 350 publications
- 73304 animals used

- unnecessary repetition e.g. adverse effect of chemotherapy on healing

- 83 % no mention of sterility in surgery
- 91% no mention of postoperative analgesia
Refinement
Mechanical-evoked pain behaviours were most commonly reported.

However, the largest differences in spontaneous pain behaviours.

Spontaneous pain behaviour important outcome measure for clinical relevance and development of effective therapeutic targets.

Useful for severity assessment and ethical evaluation.
All 3Rs – SRs make quality of publications transparent

- 2010 ARRIVE = Animal Research: Reporting In Vivo Experiments
- Guidelines adopted by 400 journals
- Baker 2014: No implementation yet!
Best practice approach

• By doing SRs, you also implement the 3Rs and more

What is needed?

• Ethics committees should ask for (steps of) SRs, at least a comprehensive search:
  • Prevent unnecessary duplication
  • Provide evidence for choice of animal model
  • Substantiate research question

• Funding bodies should ask and fund SRs: what is the currently available knowledge and evidence?

• Editorial boards should enforce ARRIVE – BJP uses compulsory checklist
More information:

- Website **www.syrcle.nl**
  - **Free newsletters**
  - **E-learning**
  - **Workshops**
  - **Coaching**
- Contact: Merel.Ritskes-Hoitinga@radboudumc.nl

Thank you!