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Emily Sena, Ph.D.

Neuroscience

University of Edinburgh

Born in 1982 in London

Studied Neuroscience at the University of Edinburgh and at the University of Melbourne

FELLOWSHIP
College for Life Sciences

PROJECT

Meta-Research on Animal Studies: Increasing the Utility

The translation of findings observed in preclinical animal studies to humans in a clinical setting has been woefully unsuccessful in many areas. I research in vivo scientific methods across the life sciences to identify ways to improve the efficiency with which that research is performed and delivered. My ultimate aim is to increase the likelihood of translation from animal studies to human clinical trials.

I would assert that studying the scientific methods of animal studies empirically (i.e. research about the research) is a necessity, given the resources required to conduct them, the waste that occurs when they do not contribute to the advancement of scientific knowledge and that human lives can depend on the efficiency and reliability of the data generated.

My research will be twofold.

- Firstly, to develop a roadmap to guide the increased use of these techniques and to provide further examples of the utility of this approach, to consolidate its position as an appropriate field of research deserving support in its own right. This requires engagement with other established disciplines, funders, journals and institutions.

- Secondly, I propose to investigate approaches to dealing with the different cultures across biomedical disciplines, the purpose being to promote change in cultural norms in a positive and open rather than a threatening or punitive manner.

I propose to engage with the few other large-scale initiatives in this space, whose success has been mainly due to the dedication and volunteering of enthusiastic scientists with an interest in the scientific rigour of clinical studies. Learning from the successes and failures of other meta-research fields will provide greater insight and understanding to the direction and strategic decisions of meta-research on animal studies.

During my research career, I have noted some stark differences in cultures across biomedical in vivo scientists. The primary goal of meta-research on animal studies is to inform improvements in the validity of preclinical experiments to increase the likelihood of translating their findings to humans. I propose to investigate the differences in cultural norms across preclinical animal research to adjust how my research is perceived and to facilitate equal collaboration in place of fear of castigation.

Recommended Reading

Macleod, M. R., A. Lawson McLean, A. Kyriakopoulou, S. Serghiou, A. de Wilde, N. Sherratt, T. Hirst, R. Hemblade, Z. Bahor, C. Nunes-Fonseca, A. Potluru, A. Thomson, J. Baginskaite, K. Egan, H. M. Vesterinen, G. L. Currie, L. Churilov, D. W. Howells, and E. S. Sena (2015). "Risk of bias in reports of in vivo research: a focus for improvement." PLoS Biology 13, 10: e1002301.

Sena, E. S., G. L. Currie, S. M. McCann, M. R. Macleod, and D. W. Howells (2014). "Systematic reviews and meta-analysis of preclinical studies: why perform them and how to critically appraise them." Journal of Cerebral Blood Flow and Metabolism 34, 5: 737-742.

Sena, E. S., H. B. van der Worp, P. M. W. Bath, D. W. Howells, and M. R. Macleod (2010). "Publication bias in reports of animal stroke studies leads to major overstatement of efficacy." PLoS Biology 8, 3: e1000344.

PUBLICATIONS FROM THE FELLOW LIBRARY

Sena, Emily (2019)

How our approaches to assessing benefits and harms can be improved

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1048926680

Sena, Emily (2012)

The benefit of hypothermia in experimental ischemic stroke is not affected by pethidine

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=864353480