Resources and Reading Materials for Rigor and Responsibility in Research

RCR Winter Symposium, Cornell University 2017

1. **Resources from the NIH:**
    a. **Upcoming requirements** for training in scientific rigor and transparency to enhance reproducibility in Life Sciences Research for all individuals supported by training grants, career development awards or fellowships, to be implemented in early 2017. https://grants.nih.gov/grants/guide/notice-files/NOT-OD-16-034.html
    b. Principles and expectations regarding Rigor and Reproducibility in reporting preclinical research pubhttps://www.nih.gov/research-training/rigor-reproducibility/principles-guidelines-reporting-preclinical-research
    c. Resource Chart on Rigor and Reproducibility https://grants.nih.gov/grants/RigorandReproducibilityChart508.pdf
    d. Updated application instructions for grant applications to the NIH to enhance rigor and reproducibility in research: https://www.nih.gov/research-training/rigor-reproducibility/updated-application-instructions-enhance-rigor-reproducibility

2. **Publications, presentations and journal requirements:**
    a. A Jan 2017 article published in Nature: A Manifesto for Reproducible Science
    b. **Nature has published a guide for reporting life sciences research and a checklist used by its reviewers.** Reporting Life Sciences Research **"**This non-exhaustive list summarizes several elements of methodology that are frequently poorly reported. Inconsistent reporting may lead to incorrect interpretation of results and a lack of reproducibility. To improve the transparency and the reproducibility of published results, we ask that authors include in their manuscripts relevant details about these elements of their experimental design. During peer review, authors confirm via the Reporting Checklist For Life Sciences Articles that this information is reported..... to ensure good reporting standards and to improve the reproducibility of published results."
    c. An interesting presentation, titled "Rigour Mortis: How Bad Research is Killing Science", by Professor Malcolm MacLeod , Professor of Neurology and Translational Neuroscience at the University of Edinburgh, and some of many publications exploring why and how experimental treatments proven to be effective in preclinical evaluations have shown disappointing clinical efficacy.

       Risk of Bias in Reports of In Vivo Research: A Focus for Improvement http://www.research.ed.ac.uk/portal/en/publications/risk-of-bias-in-reports-of-in-vivo-research-a-focus-for-improvement(0b5f53a5-6eb0-4329-8c37-4467f17c474f).html

       1,026 Experimental Treatments in Acute Stroke https://www.ncbi.nlm.nih.gov/pubmed/16453316

    d. Article in the Economist, Oct 19, 2013 " Unreliable Research: Trouble at the Lab"
3. P-hacking:
    a. The extent and consequences of P-hacking in Science http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1002106
    b. Scientific Method: Statistical Errors: http://www.nature.com/news/scientific-method-statistical-errors-1.14700