**RESOURCES  
Rigor and Reproducibility**

**Background**

## Baker M (2016): Is there a reproducibility crisis? Nature 533:452-454. <https://www.nature.com/news/1-500-scientists-lift-the-lid-on-reproducibility-1.19970>

## Begley CG and Ellis LM (2012): Drug development: Raise standards for preclinical cancer research. Nature 483:531–533 <http://www.nature.com/nature/journal/v483/n7391/full/483531a.html>

## Fanelli D (2018): Opinion: Is science really facing a reproducibility crisis, and do we need it to? PNAS 115(11):2628-2631. <https://doi.org/10.1073/pnas.1708272114>

## Freedman LP, Cockburn IM, Simcoe TS (2015). The Economics of Reproducibility in Preclinical Research. PLOS Biology 13(6): e1002165. <https://doi.org/10.1371/journal.pbio.1002165>

## Horton R (2015): Offline: What is medicine's 5 sigma? Lancet 385(9976):1380. <https://doi.org/10.1016/S0140-6736(15)60696-1>

## Ioannidis JPA (2005) Why Most Published Research Findings Are False. PLoS Med 2(8): e124. <http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0020124>

## National Academies of Sciences, Engineering, and Medicine. 2019. *Reproducibility and Replicability in Science*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25303>

## Prinz F et al. (2011): Believe it or not: how much can we rely on published data on potential drug targets? Nat Rev Drug Discov 10(9):712. <https://doi.org/10.1038/nrd3439-c1>

**Meetings and Initiatives**

1. Defining Reproducibility: <https://f1000research.com/articles/8-36>

## Landis SC et al. (2012): A call for transparent reporting to optimize the predictive value of preclinical research. Nature 490:187-191. <http://www.nature.com/nature/journal/v490/n7419/full/nature11556.html>

1. NIH Guidance: Rigor and Reproducibility in Grant Applications: <https://grants.nih.gov/policy/reproducibility/guidance.htm>
2. NIH Rigor and Reproducibility Resources:  
   <https://www.nih.gov/research-training/rigor-reproducibility>
3. The Reproducibility Initiative:  
   <https://blog.scienceexchange.com/2012/08/the-reproducibility-initiative>
4. Validation (Science Exchange Network): <https://validation.scienceexchange.com>