



The Crisis of Reproducibility in Biomedical Research

Science Editorial

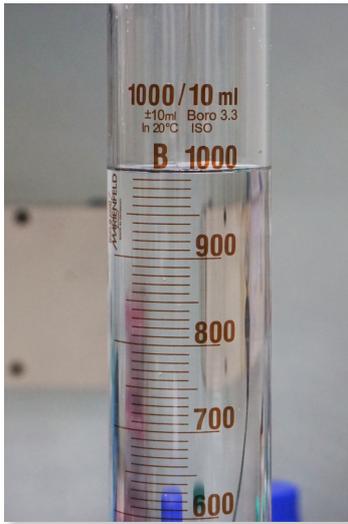
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Photos and article
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Let's imagine that you are trying to cook something that your grandmother used to make. However, no matter how strictly you follow your grandmother's recipe, the taste of your cooking will probably not be exactly the same as your grandmother's cooking. There are many reasons for this, such as different cooking skills or techniques. Even if you use the same process, it is very hard to recreate the exact taste of food because of different techniques, equipment, and materials.

A similar situation is happening in modern science. Even skillful scientists with good experimental techniques might not be able to reproduce the same results of an experiment in a published research paper. This is a serious problem for science.

Reproducibility is the ability to acquire the exact same result when other scientists follow the same experimental procedure and use the same instruments as described in the research paper. Published research needs to be reliable and credible for the continuous accumulation of scientific knowledge. However, it is possible to publish scientific papers even if some of the results in a paper are



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not always reproducible. According to an [article](#) in *Nature*, more than 70% of biomedical research papers are not reproducible.

The reproducibility of scientific papers is considered a fundamental principle in research. Trust in scientists is a fundamental component of scientific advancement, but reproducibility in scientific research has gradually fallen. Almost every field of science is suffering from this reproducibility problem.

If distrust in research reproducibility accumulates long enough to harm research credibility, the general public and scientists have to question every research result, and that will slow down the growth rate for advances in science. It is important to figure out what is ruining the reliability of science.

Many scientists point out that corner-cutting and poor scientific practices are the main causes of this crisis of reproducibility. Most scientists, even with excellent experimental techniques, unintentionally make some mistakes in their papers due to poor experimental design, execution, and analysis. Worse, many scientists don't even know whether their results are correct or not.

Exaggerating and overstating their results is also a problem that disrupts reliability. Research with a biased perspective makes it difficult for scientists to make the correct conclusion. Likewise, cases of fraud and poor experimental analysis cast doubt on reproducibility in research.

To overcome this atmosphere of distrust in research, scientists should do open-accessible research. They should attach every step-by-step result for every single process, whether the experiments fails or succeeds. Open-accessible data makes it easier for scientists to reproduce a paper's experiment. Some scientists don't want to disclose data that does not support their conclusion or because it might reveal their unique know-how or proprietary laboratory techniques. However, the public should insist that scientists must be more open about their research before it causes more problems.