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## Unreliable research

## Trouble at the lab

Scientists like to think of science as self-correcting. To an alarming degree, it is not

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"I SEE a train wreck looming," warned Daniel Kahneman, an eminent psychologist, in an open letter last year. The premonition concerned research on a phenomenon known as "priming". Priming studies suggest that decisions can be influenced by apparently irrelevant actions or events that took place just before the cusp of choice. They have been a boom area in psychology over the past decade, and some of their insights have already made it out of the lab and into the toolkits of policy wonks keen on "nudging" the populace.

Dr Kahneman and a growing number of his colleagues fear that a lot of this priming research is poorly founded. Over the past few years various researchers have made systematic attempts to replicate some of the more widely cited priming experiments. Many of these replications have failed. In April, for instance, a paper in *PLoS ONE*, a journal, reported that nine separate experiments had not managed to reproduce the results of a famous study from 1998 purporting to show that thinking about a professor before taking an intelligence

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# On the reproducibility of science: unique identification of research resources in the biomedical literature

Nicole A. Vasilevsky<sup>1</sup>, Matthew H. Brush<sup>1</sup>, Holly Paddock<sup>2</sup>, Laura Ponting<sup>3</sup>, Shreejoy J. Tripathy<sup>4</sup>, Gregory M. LaRocca<sup>4</sup>, Melissa A. Haendel<sup>1</sup>

PubMed ID: [24032093](#)

October 9, 2013: **Minor correction:** The Funding Statement is in error. The sentence that reads "The Zebrafish Information Network and Flybase are funded by the National Human Genome Research Institute (P41 HG002659 and P41 HG000739, respectively)" should instead read "The Zebrafish Information Network is funded by the National Human Genome Research Institute (P41 HG002659). FlyBase support for this project was provided by an NHGRI / NIH grant HG000739 (W. Gelbart, Harvard University, PI, N. H. Brown, coPI)."

## > Author and article information

## ∨ Abstract

Scientific reproducibility has been at the forefront of many news stories and there exist numerous initiatives to help address this problem. We posit that a contributor is simply a lack of specificity that is required to enable adequate research reproducibility. In particular, the inability to uniquely identify research resources, such as antibodies and model organisms, makes it difficult or impossible to reproduce experiments even where the science is otherwise sound. In order to better understand the magnitude of this problem, we designed an experiment to ascertain the "identifiability" of research resources in the biomedical literature. We evaluated recent journal articles in the fields of Neuroscience, Developmental Biology, Immunology, Cell and Molecular Biology and General Biology, selected randomly based on a diversity of impact factors for the journals, publishers, and experimental

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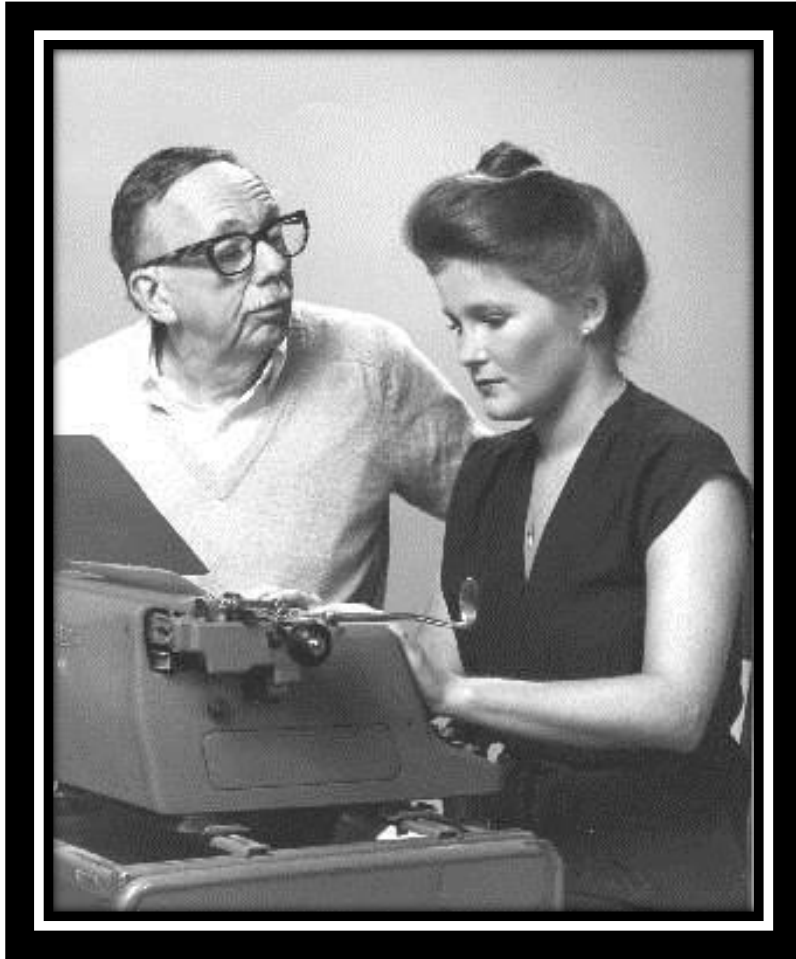


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UNIT SIZE: 25  $\mu$ g  
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Liquid. In 100 mM NaCl, 25 mM Tris-HCl, 2.5 mM MgCl<sub>2</sub>, 1 mM CaCl<sub>2</sub>, 30% glycerol, pH 8.0. AVOID FREEZE/THAW CYCLES. Recombinant, human Rho-GDI $\alpha$  fused to GST and expressed in *E. coli*. Expressed as a GST fusion protein with the GST later removed by thrombin cleavage. Suitable for use in *in vitro* Rho GTPase activity assays. Rho-GDI binds to the GTPase Rho in its GDP bound form and prevents it from being converted to the active, GTP-bound form by the guanine nucleotide exchange factor. *Biological activity:* Significantly inhibits *Rho A* GEF exchange activity at a concentration of ~2  $\mu$ M. Purity:  $\geq$ 90% by SDS-PAGE. M.W. 30000.

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<a href="#">Poly-L-ornithine</a>	Sigma-Aldrich	<a href="#">P-3655</a>	<p>5 mg/ml stock solution prepared in double distilled water (Stable for several months at -20 °C).</p> <p>Working concentration 0.5 mg/ml in water (Stable for 1 month at 4 °C).</p>
<a href="#">Fibronectin</a>	R&D Systems	<a href="#">1030-Fn</a>	Do not agitate stock solution
<a href="#">Filtration Apparatus</a>	Corning Life Sciences	<a href="#">430769</a>	
<a href="#">DMEM/F-12</a>	Mediatech	<a href="#">10-090-CV</a>	See note below for complete N2 media preparation
<a href="#">Apo-transferrin</a>	Sigma-Aldrich	<a href="#">T-2036</a>	
<a href="#">Insulin</a>	Sigma-Aldrich	<a href="#">I-0516</a>	
<a href="#">Putrescine</a>	Sigma-Aldrich	<a href="#">P-5780</a>	1 M stock solution in

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Catalog Number E1910

Quantity 100 assays

Method Luciferase

Reactivity Mammalian

Sample Type Mammalian cells

Sensitivity attomole (<math>10^{-18}</math>) sensitivities

Detection Target Luciferase

Species Mammalian

Target/Molecule Descriptor Dual-Luciferase<sup>®</sup>

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Catalog Number E1910

Quantity 100 assays

Method Luciferase

Reactivity Mammalian

Sample Type Mammalian cells

Sensitivity attomole (<math>10^{-18}</math>) sensitivities

Detection Target Luciferase

Species Mammalian

Target/Molecule Descriptor Dual-Luciferase<sup>®</sup>

Time 4 seconds

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# Questions?

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