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Preclinical research: Meet patients to sharpen up research

Ulrich Dirnagl

Shoddy preclinical research is not just bad science – it is unethical. It stalls cures and exposes people to drug trials that cannot work (see, for example, G. Cossu *et al.* *The Lancet* <http://doi.org/cf29>; 2017). Researchers need a better appreciation of the connection between sloppy results and the consequences to people who have a disease.

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Stop this waste of people, animals and money

Much ink has been spilled about poor study design, lack of appropriate controls, non-blinded investigators and low statistical power. Yet the research community is failing to correct such flaws, as attested by the latest report on the ARRIVE guidelines, which were issued in 2010 to improve animal studies and are now endorsed by more than 1,000 journals (M. Enserink *Science* **357**, 1337–1338; 2017).

In our view, a firm connection between researchers and the reality of the diseases they study would help. It is all too common for a preclinical researcher never to have met a person with the disease they are working on. They therefore do not fully appreciate patients' hopes and aspirations or the burden of the illness.

Preclinical researchers need to disavow the idea that sponsors or regulators will protect patients from work of low quality. The many premature and unwarranted clinical trials prove that they don't. One example is a neural stem-cell product that was tested in a

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