

Correspondence

Frame retractions so they hold firm

The retraction last month (see *Nature* **512**, 338; 2014) of the paper 'Generation of pluripotent stem cells from adult human testis' by S. Conrad *et al.* (*Nature* **456**, 344–349; 2008) has caused some confusion in the scientific community because of its ambiguous wording, which does not serve the purpose of formally amending the scientific record.

Pluripotency is a well-defined property of stem cells both *in vivo* and *in vitro* (see, for example, J. Nichols and A. Smith *Cold Spring Harb. Perspect. Biol.* **4**, a008128; 2012). However, the retraction statement refers to the cells derived in the original paper as being "pluripotent to some level", which wrongly implies that there are different degrees of pluripotency. Such scientific sloppiness is misleading and runs counter to rigorous, evidence-based presentation of results (see, for example, *Nature* **510**, 187–188; 2014 and E. Cattaneo and G. Corbellini *Nature* **510**, 333–335; 2014).

Furthermore, it is unclear what the statement "the original conclusions are not as robust as presented in the original paper" actually means — for example, it could imply that some or all of the earlier conclusions are not entirely invalidated. In which case, we think that those details should have been specified.

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Pregnancy: study the mother's DNA as well

Research into the effects of epigenetic changes during pregnancy on the mother's long-term health is almost non-existent. This contrasts sharply with the wealth of attention paid

to such cell-heritable changes, which alter gene activity but not DNA sequence, in the fetus and placenta as a developmental origin of health and disease (see S. S. Richardson *Nature* **512**, 131–132; 2014).

The pregnant body undergoes huge changes: extensive tissue remodelling, expansion in blood volume by as much as 100%, immunological and metabolic alterations, and extensive shifts in hormone signalling. And complications such as gestational diabetes and pre-eclampsia, which both subside after giving birth, are known to increase the mother's risk of later developing type 2 diabetes (L. Bellamy *et al. Lancet* **373**, 1773–1779; 2009) or hypertension and stroke (L. Bellamy *et al. Br. Med. J.* **335**, 974; 2007). These all have big implications for public health.

We need to proceed cautiously when building causal narratives for health outcomes, and it might be hard to study epigenetic effects in mothers when few other results are available for comparison. But grant applications, hypotheses and experimental design should not be framed by the fetus alone.

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Pregnancy: no safe level of alcohol

In our view, Sarah Richardson and colleagues understate the risks of alcohol consumption during pregnancy (*Nature* **512**, 131–132; 2014). Fetal alcohol spectrum disorders are among the three leading causes of intellectual disability (C. O'Leary *et al. Dev. Med. Child Neurol.* **55**, 271–277; 2013).

Alcohol can disrupt brain development throughout pregnancy, often without causing the recognizable facial changes of fetal alcohol syndrome. The child can experience life-long cognitive and behavioural effects as a result (see, for example,

S. N. Mattson *et al. Neuropsychol. Rev.* **21**, 81–101; 2011).

A recent meta-analysis of 34 published cohort studies has revealed an association between moderate levels of alcohol exposure *in utero* and behavioural problems during childhood (A. L. Flak *et al. Alcohol Clin. Exp. Res.* **38**, 214–226; 2014). The study authors conclude that there is no known safe amount of alcohol that can be consumed while pregnant.

Thoughtful discussion of the risks of drinking alcohol during pregnancy is likely to enhance, rather than restrain, women's freedom in the long term.

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Count the social cost of oil sands too

Efforts to eliminate carbon pollution should not divert attention from other pressing issues that have accompanied oil-sands development (see W. J. Palen *et al. Nature* **510**, 465–467; 2014), such as indigenous rights, health inequities and social problems. In Canada, for example, housing shortages, substance abuse and food insecurity have all been attributed to Alberta's large-scale oil-sands production.

Furthermore, halting production from oil sands will not solve climate or environmental problems at a stroke. In our view, a better approach would be to ban fuels that emit large amounts of carbon dioxide, sulphur dioxide and harmful gases. This moratorium might include fuels such as coal, lignite, shale gas, and oil from tar sands or shale (see also A. Leach and B. Boskovic

Nature **511**, 534; 2014).

In summary, it is important for energy and environmental policies to be discussed alongside those that involve public health, sustainable economic development, job creation and social justice (see also T. Measham and D. Fleming *Nature* **510**, 473; 2014).

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Consider human will in psychology studies

To achieve the improvements advocated by Emily Holmes and colleagues for psychological treatments (*Nature* **511**, 287–289; 2014), researchers need to conceptually link studies of specific psychiatric disorders with fundamental processes that are shared by different disorders.

Psychologists often manipulate the environment of study participants (the independent variable) to alter a person's response or behaviour (the dependent variable). For example, they might compare the effects of threatening or neutral images on a subject's physiological arousal or memory. This approach lends itself to statistical analysis of group data, but it overlooks the important point that humans already control their environment by altering their responses. An example would be an anxious person who actively seeks safety by avoiding eye contact.

Research methodologies need to take into account the fact that such negative-feedback mechanisms exert control at all levels, including physiological, psychological and social (see T. A. Carey *Lancet* **382**, 1403–1404; 2013).

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