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Reader Opinions, "Name the 2010 Breakthrough", Endler on a meta analysis on high dilution research, found 25.01.2011 as well as 28.01.2011

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## Science TALK

# Name the 2010 Breakthrough

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Every December, our editors and News staff face the challenge of reviewing what science has accomplished around the world in the past 12 months, so as to select our "breakthroughs of the year." The task is an invigorating one, providing a powerful reminder of both the enormous scope and the continual advance of science. *Ardipithecus ramidus*, reprogramming cells, and human genetic variation topped our lists in recent years. Now it's your turn: **What would you dub the major scientific breakthrough of 2010?** We're eager to hear your thoughts.

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**christian.endler**

For the sake of millions of users of homeopathic medicine, a minor remark in the Newsmaker Interview with Nobel Laureate Luc Montagnier in Science 2010; 330: 1732 may be a major breakthrough: "High dilutions of something are not nothing. They are water

structures which mimic the original molecules". The interview with Luc Montagnier touches the issue of reproducibility of experiments in high dilution research. A recent bibliometric analysis on "Repetitions of fundamental research models for homeopathically prepared dilutions beyond 10-23" [1] by representatives of 4 universities addressed 24 bio-assays (models on enzymes, plants, cells, isolated organs and animals) that have up to now been investigated by the international research community in 107 studies (30 on initial experiments and 77 on follow-up experiments). Considering the 77 repeat studies alone, 69% reported effects similar to that of the initial study ("positive"), 10% reported different effects ("inverse") and 21% reported no effect ("negative"). Table 1 shows the results (%) for repetitions performed (a) in the initial laboratory, (b) in multicentre trials in contact with the initial laboratory and (c) in independent laboratories that had no contact with the initial laboratory.

(a) Initial: 83 positive / 5 invers / 12 negative  
(b) multicentre: 66 positive / 17 invers / 17 negative  
(c) independent: 44 positive / 17 invers / 39 negative

Out of the 24 models mentioned in literature, 5 models were identified yielding similar results in repetition by independent laboratories. The reasons for higher success reported from initial laboratories may range from superior handling know-how to publication bias. The phenomenon of significant and homogeneous, but inverse results is an issue worthy of discussion. The authors encourage further repeat trials of published studies in order to learn more about the bio-assays involved and test the reproducibility of results.

[1] Endler PC, Thieves K, Reich C (all Interuniversity College Graz), Matthiessen P (Witten university), Bonamin L (Sao Paolo university), Scherr C and Baumgartner S (KIKOM at Bern university): "Repetitions of fundamental research models for homeopathically prepared dilutions beyond 10-23". Homeopathy 2010; 99: 25-36; minor updates forthcoming 2011.