Rinze Benedictus (r.benedictus@umcutrecht.nl) on behalf of Science in Transition, June 2015

What is Science in Transition?

Science in Transition is a Dutch initiative in which four distinguished scientists gave a piercing analysis of the current state of Dutch universities. This received a lot of attention from public, policy makers and scientists. It added greatly to the debate in The Netherlands about scientific quality and was felt beyond the borders.

Central to the Science in Transition analysis is the realization that we need new rewards and incentives for scientists, and we should involve societal stakeholders in setting the research agenda. Current incentives combined with hypercompetition for limited funds have severe negative effects: many publications of poor quality and limited societal impact; risk aversion and avoiding complex, multidisciplinary problems; systematic under-apprecation of education and other academic duties; very poor career perspectives for young scientists.

Website

www.scienceintransition.nl/english

Science in Transition milestones

Launching conference at Royal Netherlands Academy of Arts and Sciences in Amsterdam and publication of 'position paper' at www.scienceintransition.nl (nov 2013).

After debates at all levels and an avalanche of publicity, personal invitation of Science minister to discuss current problems (march 2014).

The new nationwide 'standard evaluation protocol' for universities drops 'quantity' as a separate category for scientific quality and emphasizes societal impact of science (march 2015). The protocol is outlined by the Royal Netherlands Academy of Arts and Sciences, the Association of universities in the Netherlands, and the Netherlands Organisation for Scientific Research.

Influential government report about the financing of Dutch universities shows substantial overlap with Science in Transition analysis (may 2014). Science in Transition members were invited to provide input in public hearings.

European Commission recognizes relevance of Dutch debate in "Science 2.0: Science in Transition" analysis and public consultation (july 2014). Science in Transition participates

in multiple workshops in different member states to interpret the outcomes of the public consultation.

Science in Transition participates in European Responsible Research and Innovation conference in Rome (nov 2014).

Science in Transition advises the Netherlands Organization for Health Research and Development in developing a national research program *Fostering responsible research* (2015).

Professor Frank Miedema pitched Science in Transition at the 2014 TEDxMaastricht event (October 2014).

Dutch government report "2025 Vision for Science: choices for the future" promotes rethinking scientific quality, advocates stakeholder interaction and proposes a National Research Agenda (nov 2014).

Dutch association of universities signs *San Francisco Declaration on Research Assessment* at second Science in Transition conference (dec 2014).

Science in Transition discusses possible changes in the science system with members of parliament in a public hearing about the Dutch government report "2025 Vision for Science: choices for the future" (january 2015).

Science in Transition is asked to join the international US-based METRICS Network. The *Meta-Research Innovation Center at Stanford* is a research to action center focused on transforming research practices to improve the quality of scientific studies in biomedicine and beyond (june 2015).

International context

Science in Transition joins an international chorus that points out flaws in the science system and aims for change. Although parts of the analysis go back quite some time, this debate has only in recent years gained momentum.

- The San Francisco Declaration On Research Assessment wants to put an end to the use of bibliometric parameters when deciding what researchers should receive grants or jobs. (December 2012)

- Newspaper The Economist made the problems in science a cover story ("How Science Goes Wrong"). It focuses on unreliable research and states that many errors in science go uncorrected. (October 2013)
- Nobel Prize winner Randy Schekman calls for a boycott of journals with high impact factors like Science, Nature and Cell. (December 2013)
- The Reproducibility Initiative wants to reproduce landmark studies since reproducing important papers in the current system is not rewarded, while it is of vital importance.
- Medical journal The Lancet wants to "increase value and reduce waste" in biomedical research. It discusses ways to do so in a series of articles. (January 2014). In response the REWARD Network was started: http://researchwaste.net/.
- The US National Institutes of Health are exploring initiatives to restore the self-correcting nature of preclinical research. (January 2014)
- Promotion and grant committees should be reading through papers and judging research by its merit, says Nobel Prize winner Sydney Brenner. "I know of many places in which they say they need this paper in Nature, or I need my paper in Science because I've got to get a post doc. But there is no judgment of its contribution as it is." (March 2014)
- Biomedical science in the US needs to be rescued from its "systemic flaws", write Bruce Alberts and Harold Varmus in PNAS (March 2014). One of their recommendations is "to gradually reduce the number of entrants into PhD training in biomedical science — producing a better alignment between the number of entrants and their future opportunities—and to alter the ratio of trainees to staff scientists in research groups."
- Alberts and colleagues follow up on their article by starting the website rescuingbiomedicalresearch.org where the debate continues and solutions are discussed.
- Former Secretary General of the European Molecular Biology Organization Gottfried Schatz analyses the effects of Big Science in an essay in Nature Reviews Molecular Cell Biology. The exponential growth of science has led to meaningless quantification, a crisis in peer review, reproducibility problems and the rise of fellowships (May 2014).
- Stanford University launches Meta-Research Innovation Center at Stanford (METRICS) to transform research practices to improve the quality of scientific studies in biomedicine and beyond.
- Modify reward system for science to create reproducible and translatable research, says John Ioannidis inPLoS Medicine. With the current reward system "an estimated 85% of research resources are wasted". (October 2014)