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Crash and burn: the careers of Jan Hendrik Schön (left) and Victor Ninov were closely matched, from promising beginnings, through acclaimed publications, to ultimate disgrace and discredit.

But that wasn't the case for the paper on elements 116 and 118, which was formally retracted during the same month[6]. By then, Ninov's career at the Lawrence Berkeley lab had unravelled, after his colleagues delved into data files and discovered the same type of manipulation identified at the GSI.

These two cases have prompted reforms. In November, for instance, the American Physical Society issued guidelines on ethics and the responsibilities of co-authors, intended to prevent a repeat of the situation in which Schön could falsify data without anyone looking over his shoulder. The guidelines list "co-authors who are accountable for the integrity of critical data reported in the paper, carry out the analysis, write the manuscript, present major findings at conferences, or provide scientific leadership" as bearing responsibility for all of a paper's contents.

Rules or role models?

But some physicists have already complained that the new guidelines place too great a burden of responsibility on the supervisors of junior researchers. And the US Office of Research Integrity, which reviews allegations of scientific misconduct relating to projects funded by the National Institutes of Health (NIH), has been trying unsuccessfully for several years to require all NIH grant holders to receive ethics training. The proposal has languished in the face of opposition from the Federation of American Societies for Experimental Biology (FASEB). "My position is that you learn by watching role models, not by being in a mandated or instructed programme," says FASEB president Steven Teitelbaum, a pathologist at Washington University in St Louis, Missouri.

The German system that trained Schön and Ninov, on the other hand, had earlier introduced codes of scientific good practice and new mechanisms for investigating allegations of misconduct in the wake of the case of Friedhelm Herrmann and Marion Brach — cancer researchers who systematically fabricated data in scores of publications while at the Max Delbrück Centre for Molecular Medicine in Berlin in the early 1990s.

While the scientific community wrestles with how to prevent similar scandals in the future, the immediate repercussions of the Schön and Ninov cases are still being felt. Ninov is fighting to clear his name, and has hired an attorney who specializes in employment disputes. In January, the University of California, which manages the Berkeley lab, will hold a grievance hearing on Ninov's firing.

Science has already published a brief note retracting eight of Schön's papers[7]. *Nature* will shortly run separate retractions for each of Schön's papers; in the meantime, the online versions carry a warning about the conclusions of the Beasley report. Other journals are going through similar processes.

Hopefully, these will run their course more rapidly than in previous misconduct cases. In July, *Nature* investigated the status of the 94 papers authored by Herrmann and Brach that were listed two years previously in an official inquiry as "definitely or probably" containing manipulated data. Many had not been retracted, and some journal editors were not even aware of the misconduct investigation[8].

Science may be self-correcting, but sometimes it is a painfully slow process. ■

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1. http://www.lucent.com/news_events/researchreview.html
2. Ninov, V. *et al. Phys. Rev. Lett.* **83,** 1104–1107 (1999).
3. Hofmann, S. *et al. Z. Phys. A* **350,** 277–280 (1995).
4. Hofmann, S. *et al. Z. Phys. A* **354,** 229–230 (1996).
5. Hofmann, S. *et al. Eur. Phys. J. A* **14,** 147–157 (2002).
6. Ninov, V. *et al. Phys. Rev. Lett.* **89,** 039901(E) (2002).
7. Bao, Z. *et al. Science* **298,** 961 (2002).
8. Abbott, A. & Schwarz, J. *Nature* **418,** 113 (2002).

Highlight: Genomics

Sorry, dogs — man's got a new best friend

Compared with the media frenzy that greeted the publication of the human genome, coverage of the draft mouse sequence, unveiled this month[1], was a relatively sedate affair. But for many scientists, the mouse genome deserves at least equal billing, as it provides the key to unlock the secrets of our own DNA.

The two genomes, it turns out, are remarkably similar: 99% of mouse genes have a direct human counterpart. It is not a unique set of genes that make us human rather than murine, but rather the way that they are regulated.

On one level, this humbling similarity exposes the daunting complexity of mammalian biology. But it also means that the mouse — newly named as man's best friend — is here to help promote our self-knowledge, and to spur medical advances.

Armies of mutant mice are being created to study human diseases, and to understand myriad aspects of our biology. Molecular tools to interpret sequences are also being developed apace. For instance, a new set of mouse complementary DNA clones[2] will make it easier to investigate gene function by generating 'knockout' mice.

What next? Another team has already posted on the Internet a preliminary assembly of the rat genome[3], and a peer-reviewed publication should follow next year. This is good news for physiologists, for whom the rat is the favourite experimental animal.

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1. Mouse Genome Sequencing Consortium *Nature* **420,** 520–562 (2002).
2. The FANTOM Consortium and the RIKEN Genome Exploration Research Group Phase I and II Team *Nature* **420,** 563–573 (2002).
3. www.hgsc.bcm.tmc.edu