

SPECIAL REPORT

Credit where credit's due

Disputes over who truly deserves the credit — or blame — for published work can result in bruised egos, damaged careers and court cases. **Helen Pearson** looks at ways to avoid fights over authorship.

A flurry of squabbles about high-profile biological research is prompting scientists to revisit a perennially touchy subject: how should credit for scientific findings be assigned?

In recent months, a panel on research integrity at the University of Pittsburgh, Pennsylvania, scolded cloning expert Gerald Schatten for his limited contribution to papers he co-authored with a South Korean team. Ian Wilmut of the Roslin Institute in Edinburgh has been criticized for taking most of the credit in 1997 for the cloning of Dolly the sheep. And a co-author has accused Alison Murdoch, of the University of Newcastle upon Tyne, UK, of hogging the credit for an advance in cloning human embryos (see 'Cloning clashes').

These quarrels all involve cloning, but they

resonate with a wider audience. Scientists often work for years towards a breakthrough; the recognition for it can bring prestige, promotion and pay. Small wonder, then, that they care about how credit is assigned.

"This is about one of the most important questions you can ask, because credit more than anything drives science," says Drummond Rennie, deputy editor of the *Journal of the American Medical Association (JAMA)*. But he and others say that there are some simple courtesies and practices that could, if widely adopted, help ease any tension.

Most concern focuses on who gets listed as an author on a publication. Tallies of such publications are one of the main measures of scientific achievement. And it is particularly important for a key finding: "The difference in

authorship at the time can end up being the difference between a Nobel Prize and not," says Nicholas Steneck, an expert in research ethics at the University of Michigan in Ann Arbor.

By some measures, abuses of and disputes over credit are commonplace. In 2005, a team of researchers from Minnesota found that 10% of US scientists surveyed admitted inappropriately assigning authorship in a paper¹. And in a study of young physicists, some 4% reported that they had seen cases in which relevant studies were not cited in a paper². The practice infuriates many scientists, because they feel they are being cheated of acknowledgement, and because citation counts are another measure of a paper's — and an author's — worth.

The central problem is that there are no set

CLONING CLASHES

Several prominent cloning researchers have recently found themselves in disputes over who should take credit for major discoveries.

- At an employment tribunal this month in Edinburgh, UK, Ian Wilmut of the Roslin Institute said that he played a mostly supervisory role in the cloning experiments that spawned Dolly the sheep³, and that most of the credit should go to co-author Keith Campbell. The

admission came as little surprise to many in biomedical science: a laboratory leader's main contribution is often ideas and guidance rather than experiments. But bitterness remains: one of Wilmut's technicians, Bill Ritchie, told the *Guardian* newspaper that

more of the credit should have gone to him. When approached by *Nature*, Wilmut said: "The legal case is still going on and I am afraid that in these circumstances I cannot comment."

- In January, stem-cell biologist Miodrag Stojkovic (left) went public with claims that he left the University of Newcastle upon Tyne, UK, partly because his colleague Alison Murdoch (far left) took public credit for controversial human nuclear-transfer experiments⁴. The university says that Stojkovic was consulted on all publicity relating to his work, and that he received credit in many major media outlets.

- Last month, the University of Pittsburgh in Pennsylvania chastized its biologist Gerald Schatten (right) for assuming co-authorship on two papers⁵⁻⁷ from the lab of disgraced stem-cell scientist Woo Suk Hwang of Seoul National University in South Korea.



He was quick to distance himself from the work when doubts were raised about the veracity of the data. A report from a university investigative panel was particularly biting about Schatten's contribution to the report of the cloned dog Snuppy. It said that "his major contribution to the paper was a suggestion that a professional photographer be engaged so that Snuppy would appear with greater visual appeal. It is less clear that this contribution fully justifies co-authorship." H.P.



NORTH NEWS AND PICTURES

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N. FEANNY/CORBIS SABA

Who cloned Dolly? The work brought fame for Ian Wilmut, above; he says a colleague deserves most of the credit; and a lab technician feels unfairly left out.

rules for assigning credit. Biologists tend to place a supervisor or lab head last in an author list; organic chemists might put him or her first. Until recently, it was standard for the head of a German department or institution to take credit on a paper regardless of input. Graduate students and postdoctoral fellows frequently complain of being pushed down the author list, if they are included at all.

These differences in expectation create fertile ground for disputes. And many say that the number and ferocity of such clashes is rising with the number of collaborative projects, which often have multiple authors spanning disciplines and national borders. In genome sequencing and particle-physics collaborations, for example, a paper's author list can run into the hundreds. Some of these fights become public when there is disagreement about who should talk to, and be acknowledged in, the press. "Some people are very good at co-opting the media and blowing their own horn," says Martin Blume, editor-in-chief of the American Physical Society.

Many institutions, societies and journals have guidelines on what deeds warrant a name on a paper. According to the International Committee of Medical Journal Editors (ICMJE), authors must have made a substantial intellectual contribution to a study's conception and design, or to the acquisition,

analysis or interpretation of data. They must also have drafted or revised the article's intellectual content, and approved the final version.

Ground rules

On this basis, a technician who performed routine genetic sequencing, a colleague who supplied an antibody, or a departmental bigwig who supplied funding would be relegated to the acknowledgements. The ICMJE guidelines also say that authors should be able to take public responsibility for appropriate portions of the work — in other words, they must take the flak if the results come under fire, as Pittsburgh's Schatten found.

Whatever the rules, many scientists feel that the reality is different. "We all know labs where powerful figures appear on papers that are not within their field of expertise," says Ray Dolan, who heads a neuroscience imaging department at University College London. A particular problem, he says, is researchers who invent a technique and then demand credit every time it is used, even after it becomes standard procedure.

One way to avoid ambiguity is for each author to spell out their contribution in the paper. Many medical journals, including *JAMA*, require this. The practice is voluntary at *Nature*; editors at *Science* are considering whether to introduce it. "It's moral, it's easy

and it takes up virtually no space," says Rennie, who has pushed for adoption of the practice.

Training scientists in the ethics of authorship could also help; many such courses already exist. In his ethics course, neuroscientist Michael Zigmond, of the University of Pittsburgh, asks graduate students and postdocs to consider a case study of ten people and reach a consensus on whose contribution merits authorship. The participants, he says, often disagree at first, but eventually agree on criteria.

Indeed, many scientists say that the simplest way to avoid fights is to discuss authorship when a collaboration begins. "Proactive discussion is really important," says Kate Kirby of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, who co-authored the survey of young physicists.

The stakes are perhaps highest for the most prestigious scientific prize, the Nobels. Goran Hansson, who chairs the Nobel Committee for Physiology and Medicine, says it would help his task if the research community could agree on criteria for co-authorship. "We would still have to be very meticulous," he says, "but it would be a bit easier."

1. Martinson, B. C., Anderson, M. S. & de Vries, R. *Nature* 435, 737-738 (2005).
2. Kirby, K. & Houle, F. A. *Phys. Today* 57, 42-46 (2004).
3. Wilmut, I., Schnieke, A. E., McWhir, J., Kind, A. J. & Campbell, K. H. S. *Nature* 385, 810-813 (1997).
4. Stojkovic, M. et al. *Reprod. Biomed. Online* 11, 226-231 (2005).
5. Hwang, W. S. et al. *Science* 308, 1777-1783 (2005).
6. *Science* 311, 335 (2006).
7. Lee, B. C. et al. *Nature* 436, 604 (2005).

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