

As science grows in China, ethics education aims to keep up

By Brian Lin and Becky Ham

A massive national effort in China to improve scientific integrity has brought the issue to the attention of a staggering number of researchers in that country: In less than 4 years, more than 8 million undergraduate and graduate students have listened to 20,000 lectures on the topic.

But experts at a recent meeting held at AAAS said that ethics education should start even earlier for Chinese and American researchers and that such education faces stiff challenges from a research environment that, in some instances, serves as a breeding ground for authorship disputes and misuse of data, among other problems.

With international scientific collaborations on the rise, the issue of integrity is increasingly important, the meeting's participants agreed. "The only way the scientific enterprise can contribute to worldwide problems is for...scientists to be willing, able, and enthusiastic about collaborating on a worldwide scale," said AAAS CEO Alan I. Leshner. "Central to any collaboration are issues like trust, shared values, norms, and standards that drive the practice."

The China-U.S. Scientific Morality/Integrity Development Seminar was the fourth such meeting convened since the Scientists' Social and Ethical Responsibilities conference organized by the China Association for Science & Technology (CAST) and AAAS in 2007. Since then, CAST and AAAS have collaborated on several workshops on scientific integrity, and in 2010 established a joint steering committee to coordinate ethics work.

Total research funding for Chinese universities ballooned from US\$7.6 billion in 2009 to US\$12.7 billion in 2012, said Guangxian Li, the executive vice president of Sichuan University, who spoke at the 8 to 9 October seminar on behalf of Shen Yan, vice chairman of CAST and deputy director of the National Natural Science Foundation of China. Research papers published by Chinese universities saw a 10% increase—to more than 1.1 million—during the same period.



Graduate students attend a public lecture on research ethics at the Great Hall of the People, in Beijing.

The desire to achieve higher international standings has put enormous pressures on Chinese researchers to publish, said Li. The QS World University Rankings and Times Higher Education World University Rankings, for example, base 60 to 70% of their scores on research and citations.

But a national Chinese survey of more than 30,000 Chinese researchers found 51% of respondents admitted to frequently or occasionally improperly attributing sources, while 42% submitted manuscripts to multiple journals. Another survey of nearly 5500 graduate students from 24 universities, conducted a year later, revealed a similar trend.

An ambitious national campaign launched in 2011 by the Chinese Ministry of Education, Li said, is raising awareness of these issues. Six thousand graduate students from 60 universities have attended annual lectures on research ethics, held at the iconic Great Hall of the People, in Beijing. But education should start even earlier in a student's career, said Diange Yang, a professor in Tsinghua University's department of automotive engineering and deputy dean responsible for research work and international cooperation.

"Strengthening academic integrity education of graduate students...should be the responsibility of the whole society, and it should be done from childhood," said Yang.

The United States is unlikely to hold national ethics lectures as has happened in China, but AAAS has joined the National Science Foundation and the Office of Research Integrity in conducting ethics education for scientists, said Mark S. Frankel, director of the AAAS Scientific Responsibility, Human

Rights and Law Program. By the end of the year, AAAS will post on its website seven case studies from a 2012 workshop that address issues of authorship, conflict of interest, collaboration, and plagiarism. And Frankel, Leshner, and Yang Wei, director of China's National Natural Science Foundation, are co-authors of a chapter on Chinese and American research integrity and ethics education that will be published in the "Handbook of Academic Integrity" in 2015.

Though essential, education in responsible research conduct is not enough, said Philip Langlais, professor of psychology and former vice provost of graduate studies and research at Old Dominion University. A 2006 survey he conducted with 222 faculty and 534 graduate students in the United States found that while up to 90% of faculty reported providing training in responsible research conduct, up to 35% of students claimed they received no training. Only 8% of students and faculty reported having discussed and reached consensus on topics such as authorship, ownership, and use of data.

"We've been targeting individuals, but not other layers of influence," Langlais said. "Scientists who have received proper training in responsible conduct of research have violated best practices and principles of scientific integrity as a result of a 'toxic' research environment" of higher workloads, shifting university priorities, and increasing competition for funding.

In both China and the United States, "you can't change climate and culture overnight," he said. "But, you can make small, incremental changes." ■

AAAS members elected as Fellows

In October 2014, the AAAS Council elected 401 members as Fellows of AAAS. These individuals will be recognized for their contributions to science and technology at the Fellows Forum to be held on 14 February 2015 during the AAAS Annual Meeting in San Jose, California. Presented by section affiliation, they are:

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AAAS Kavli Science Journalism Award winners named

By Earl Lane

Stories exploring human biology, including our interactions with the trillions of microbes we all harbor, the influences of our fishy evolutionary forebears on how we look, and the enduring challenge of understanding cancer, are among the winners of the 2014 AAAS Kavli Science Journalism Awards.

Large Newspaper—Circulation of 100,000 or more: George Johnson, *The New York Times*, for “Why Everyone Seems to Have Cancer,” 5 January 2014; “A Tumor, the Embryo’s Evil Twin,” 18 March 2014; and “An Apple a Day, and Other Myths,” 22 April 2014.

Small Newspaper—Circulation less than 100,000: Matthew LaPlante and Paul Christiansen, *Salt Lake City Weekly*, for “Devastated: The World’s Largest Organism is in Utah—and It’s Dying,” 21 November 2013.

Magazine: David Dobbs, *Pacific Standard*, for “The Social Life of Genes,” September/October 2013.

Television—Spot News/Feature Reporting (20 minutes or less): Michael Werner, KCTS 9/QUEST, for “The Ecology of Fear,” 6 March 2014.

Television—In Depth Reporting (more than 20 minutes): Michael Rosenfeld, David Dugan, and Neil Shubin, Tangled Bank Studios/Windfall Films for PBS, for “Your Inner Fish,” 9 April, 16 April, & 23 April 2014.

Radio: Rob Stein, NPR, for “Staying Healthy May Mean Learning To Love Our Microbiomes,” 22 July 2013; “From Birth, Our Microbes Become As Personal As A Fingerprint,” 9 September 2013; and “Getting Your Microbes Analyzed Raises Big Privacy Issues,” 4 November 2013.

Online: Amy Dockser Marcus, *The Wall Street Journal*, for “Trials: A Desperate Fight to Save Kids and Change Science,” 14 November 2013.



Children’s Science News: Mara Grunbaum, *Scholastic Science World*, for “Biting Back,” 16 September 2013; “Underwater Adventurer,” 7 October 2013; and “Swallowed Up,” 3 February 2014.

The awards, administered by AAAS since their inception in 1945, go to professional journalists for distinguished reporting for a general audience. The Kavli Foundation provided a generous endowment in 2009 that ensures the future of the program.

Independent panels of science journalists pick the winners, who will receive \$3000 and a plaque at the 2015 AAAS Annual Meeting in San Jose, California, in February. Learn more at www.aaas.org/sja2014. ■

Science

AAAS news and notes

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