

China's Publication Bazaar

A *Science* investigation has uncovered a smorgasbord of questionable practices including paying for author's slots on papers written by other scientists and buying papers from online brokers

SHANGHAI, CHINA—The e-mail arrived around noon from the mysterious sender “Publish SCI Paper,” with the subject line “Transfer co-first author and co-corresponding author.” A message body uncluttered with pleasantries contained a scientific abstract with all the usual ingredients, bar one: author names. The message said that the paper, describing a potential strategy for curbing drug resistance in cancer cells, had been accepted by Elsevier’s *International Journal of Biochemistry & Cell Biology*. Now its authorship was for sale.

“There are some authors who don’t have much use for their papers after they’re published, and they can be transferred to you,” a sales agent for a company called Wanfang Huizhi told a *Science* reporter posing as a scientist. Wanfang Huizhi, the agent explained, acts as an intermediary between researchers with forthcoming papers in good journals and scientists needing to snag publications. The company would sell the title of co-first author on the cancer paper for 90,000 yuan (\$14,800). Adding two names—co-first author and co-corresponding author—would run \$26,300, with a deposit due upon acceptance and the rest on publication. A purported sales document from Wanfang Huizhi obtained by *Science* touts the convenience of this kind of arrangement: “You only need to pay attention to your academic research. The heavy labor can be left to us. Our service can help you make progress in your academic path!”

On 6 July, a few weeks after our conversation with the sales agent took place, the paper appeared online in the *International Journal of Biochemistry & Cell Biology*. The print version followed in September, roughly when the agent said it would. The title and abstract had undergone minor revisions from the e-mail solicitation.

But the list of authors was transformed. On the published paper, two first authors share the honor. (Our reporter did not pay for authorship.) Interviews with authors and with the journal’s editors confirmed that a first author was added on 11 June, approximately a week after our reporter received the abstract; all deny knowledge

of anyone having paid for authorship. Following an inquiry from *Science*, an investigation by the *International Journal of Biochemistry & Cell Biology* found that a total of four authors had been added, and two dropped. (The exuberant agent had erred on one detail during our June conversation with her: By then, the paper had undergone one round of review, but had not yet been accepted. The resubmitted version with a different author lineup was accepted soon after.)

Earlier this month, *Science* told Wanfang Huizhi about our undercover operation. In an e-mailed response, Huang Wei, who identified himself as Wanfang Huizhi’s manager, denied that his firm sells authorship. The sales document that *Science* had obtained was not authentic, he said, because it did not bear his company’s official seal. Wanfang Huizhi helps authors with “language polishing, editing, and submission of manuscripts,” he wrote, so it is “very probable” that the cancer paper’s authors had sought editing help from the firm. Our reporter may have encountered a rogue employee or former employee who had “gone through irregular channels” to hawk authorship on the side, Huang wrote. He stated that Wanfang Huizhi would investigate the matter.

The sales agent’s offer is far from an anomaly in China’s publishing scene. A 5-month investigation by *Science* has uncovered a flourishing academic black market involving shady agencies, corrupt scientists, and compromised editors—many of them operating in plain view. The commodity: papers in journals indexed by Thomson Reuters’ Science Citation Index (SCI), Thomson Reuters’ Social Sciences Citation Index, and Elsevier’s Engineering Index. *Science* has documented authorship fees ranging from \$1600 to \$26,300. At the high end, fees exceed the annual salary of some Chinese assistant professors. But SCI papers—particularly those published in journals with a high impact factor—are so critical to getting promotions that researchers shell out. As Fan Dongsheng,

Online

sciencemag.org

Podcast interview with author Mara Hvistendahl (http://scim.ag/pod_6162).

a neurologist and former vice president of Peking University Third Hospital, puts it: “People are sparing no expense in order to get published in international journals.”

The options include not just paying for an author’s slot on a paper written by other scientists but also self-plagiarizing by translating a paper already published in Chinese and resubmitting it in English; hiring a ghostwriter to compose a paper from faked or independently gathered data; or simply buying a paper from an online catalog of manuscripts—often with a guarantee of publication.

Offering these services are brokers who hawk titles and SCI paper abstracts from their perches in China; individuals such as a Chinese graduate student who keeps a blog listing unpublished papers for sale; fly-by-night operations that advertise online; and established companies like Wanfang Huizhi that also offer an array of above-board services, such as arranging conferences and producing tailor-made coins and commemorative stamps. Agencies boast at conferences that they can write papers for scientists who lack data. They cold-call journal editors. They troll for customers in chat programs. “SCI papers transfer: papers about cervical cancer; head and neck cancer; kidney cancer; stomach cancer; nano-materials,” reads a chat message to one editor. They set up toll-free hotlines.

Some of the journals in which brokered papers appear belong to Chinese publishers, whereas others are located overseas and owned by publishing giants. Although the agencies market themselves to researchers in fields like medical research, in which time constraints make satisfying promotion requirements especially difficult, scientists in a range of disciplines—even those who publish on academic honesty and publishing ethics—say they have been approached. Nearly all the editors and researchers in China whom *Science* contacted about SCI paper-selling agencies were aware of their existence.

Science looked into 27 agencies that trade in SCI papers. Our targets included agencies identified by scientists we interviewed and others we found using Baidu, a popular Chinese Web search engine. Inputting “publish SCI paper” in Baidu pulls up dozens of agencies with websites brazenly touting the sale of papers for publication in SCI-ranked journals. “Ghostwrite and ghost-publish papers...SCI paper publishing,” reads one typical description. We targeted the top search results. We also looked into agencies that had purchased ads on Baidu and posted in online publishing forums, focusing on those that seemed most established. Scientists and journal editors in China, many of them speaking under condition of anonymity, helped round out our portrait of the business.

Posing as graduate students and scientists, *Science* reporters contacted the selected agencies by phone or via the Chinese messaging service QQ, inquiring about buying authorship on a paper or paying the company to write a paper. A mere five of the 27 companies we contacted refused to write papers or broker authorship. We also tracked individual papers. Some were advertised for sale ahead of publication and have not yet appeared. Others appeared in reputable journals several months after they were proffered.

Academic honesty has been a hot-button issue in China for years,

and officials hoping to project a more international image have repeatedly vowed to address it. Since coming to power in March, President Xi Jinping has spearheaded a broad attack on corruption, with the government taking aim at a spectrum of misbehavior that ranges from bribing officials to pharmaceutical company payoffs (*Science*, 2 August, p. 445). The campaign has spilled over into scientific publishing: In September, police disguised as gas company employees busted seven people who, operating out of a Beijing apartment, offered space in fake journals and collected publication fees from scientists. Their victims blew up to \$650 in fees for papers that never saw the light of day.

But most of the corrupt publishing practices that *Science* investigated have no clear victims; scientists, brokers, and some journal editors all benefit. What is at risk, say prominent researchers in China, is China’s wider achievement in science. The country has become a powerhouse in scientific publishing: The number of SCI Expanded papers originating in China skyrocketed from 41,417 in 2002 to 193,733 in 2012, ranking it second in the world, after the United States. Corrupt publication practices taint that achievement. “[Some scientists] are publishing better and better papers and getting into top-notch journals, but in the end they don’t even know what their papers say,” says Cao Zexian, a physicist at the Chinese Academy of Sciences’ Institute of Physics in Beijing. “They spend a lot of money hiring researchers to write them.”

Skewed incentives

Chinese-language journals are a prime outlet for the paper-sellers. “The number of articles appearing in Chinese-language journals that has been sold is very high,” says one journal editor in Beijing. Many compa-

nies investigated by *Science* offer to sell papers in Chinese-language journals. The purported Wanfang Huizhi sales document delineates the cost of buying articles in “core journals”—a select group of Chinese-language journals ranked by either Peking University, Nanjing University, or the Institute of Scientific and Technical Information of China.

For most Chinese scientists, however, the gold standard is English-language journals, especially the 3746 ranked by SCI, a database of citations introduced in 1963 by the Institute for Scientific Information. Thomson Reuters, which now owns the institute, uses the index to compute each journal’s “impact factor,” a tally of how many times the average article in a journal is cited in a given year. Thomson Reuters bills impact factors as a way to compare journals within fields. Evaluating individual researchers by the impact factor of the journals they publish in is “not something that we advocate,” says Nicholas Stipp, business development director with Thomson Reuters in Beijing.

But in China, “SCI papers have become the yardstick to promote scientists,” says Cong Cao, an expert on Chinese science policy at the University of Nottingham in the United Kingdom. The number of papers a researcher has published in SCI-ranked journals over a 5-year period is often the deciding factor in promotions—and typically only papers on which the candidate is a first author or corresponding author count.

“People are **sparing no expense** in order to get published in international journals.”

—Fan Dongsheng,
Peking University Third Hospital

An Aura of Legitimacy

China's SCI paper-selling agencies mimic legitimate services that help scientists struggling with English. In the 1990s, as science took off in Japan, editing outfits emerged to help polish English writing. Today, scientific language editing is a profitable sector, with established companies like American Journal Experts, Edanz, Editage, and Enago serving the global market. Besides editing, such companies offer additional services at various stages of the publication process, from suggesting appropriate journals to helping craft a cover letter. Some also edit for content and provide translation services.

For the most part, journals recognize that they benefit by receiving more polished manuscripts. Some publishers now recommend specific editing companies, and the companies

offer a discount to those journals' contributors in return.

The paper-selling agencies flourish in the aura of these reputable businesses. A Baidu search for "SCI paper editing" brings up Editage and Enago—beneath a banner ad for MicroSCI, a company that goes a step further by gathering data and writing papers for scientists, according to a representative. For some scientists, it may be difficult to tell the difference. Many paper-selling agencies contacted by *Science* appear professional and well-staffed. Several have registered with China's Industrial and Commercial Bureau. To assure clients that all of their information will be kept confidential, the agencies prepare contracts emblazoned with government-issued seals.

But any similarities to mainstream editing companies end there. MicroSCI sells its services

on Taobao.com, the Chinese answer to eBay, and it is one of several agencies that guarantee a client's paper will be published, according to a sales agent. Guaranteeing publication is an alarm bell, says Benjamin Shaw, chief operating officer for Edanz in Beijing: "It makes me uncomfortable that some companies offer this. We always take care to educate authors that we can only guarantee language quality and that journal editors make the final publication decision." (MicroSCI did not respond to repeated interview requests.) The fees charged by SCI paper-selling companies raise eyebrows as well. Edanz charges \$325 on average for language editing. Compare that with the \$26,200 an agent with the outfit Ketong Editing and Translation says it charges for authorship on a paper targeted at a high-impact Western journal.

—M. H.

(Publications in Chinese core journals can be credited toward promotions as well, but a researcher usually must amass many more of them during a short period to meet requirements.) Some universities require Ph.D. students to publish one or more SCI papers to graduate. Incentive schemes have yielded an environment in which scientists "focus on quantity, not quality," wrote Lin Songqing, an editor with the Chinese Academy of Sciences in Wuhan, in a paper in *Learned Publishing* in January. (A running joke in China now is that SCI stands for Stupid Chinese Idea.)

Pressure to publish is especially acute for medical researchers.

Even for doctors, of whom the vast majority in China work in government hospitals or clinics, securing a promotion can hinge on writing SCI papers—regardless of how many patients they see.

With the stakes so high, ways of gaming the system have cropped up. Researchers who are "eager for quick success or maybe have a low academic level" turn to SCI paper brokerages, says Zhang Yuehong, editor of the *Journal of Zhejiang University-SCIENCE* in Hangzhou and an advocate for improving journal oversight in China. (The journal is indexed in SCI Expanded.) By passing off bought papers as legitimate research, she says, "they replace pearls with fish eyes."

Because many promotion schemes in China simply tally up a researcher's total SCI publications without regard to impact factor, some paper-selling agencies target journals with negligible impact factors; a spot in SCI is enough. But Chinese institutions dole out lavish rewards ranging into the tens of thousands of dollars for publishing in highly rated journals—meaning that researchers who pay agencies for papers may get a return on their investment.

The paper-pushers

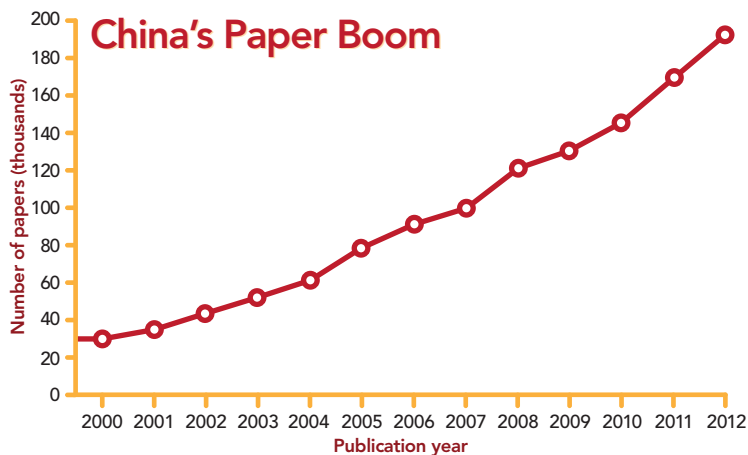
At one end of the spectrum of services offered by China's SCI-paper cottage industry, companies will translate into English a paper published in a Chinese journal. (The purported Wanfang Huizhi document specifies that researchers should avoid submitting Chinese-language papers whose abstracts can be found in PubMed.) In another arrangement called *daixie*, or "ghostwriting," a scientist will hire an agency to write a paper—a task sometimes farmed out to graduate students—and ensure its publication in a specified journal. Too busy to format papers, prepare citations and graphs according to a journal's specifications,

analyze statistics, submit your paper, and answer queries from editors when a paper is in proofs? SCI Science Paper Service Center can handle all of the above, brags its website.

Several agencies claim they collaborate with specific journals indexed in SCI to guarantee publication. A representative for one company, Haixin, was blunt about the collaborations: "We rely on our *guanxi*"—a Chinese concept evoking relationships often deepened by exchanging gifts. "To put it simply, we give them money." At least three companies offer to assist scientists who have

written a paper and want to ensure its publication. Other firms claim to purchase a set number of pages in journals. Several agencies specified both the journal and issue in which a paper would appear—even though the paper had yet to be written.

An editor at one SCI journal in China says the journal regularly receives multiple submissions from a single e-mail address. It rejects them under the assumption that the papers are ghostwritten. Other agencies may seek out journal editors willing to enter an arrangement. One editor, who worked for 6 years at a Chinese journal listed in



Speaking volumes. Since 2000, Chinese papers have increased sixfold in Thomson Reuters' SCI Expanded, a database of more than 8500 journals.

Elsevier's Engineering Index, says that in that time he was approached by scientists in need of papers about 10 times. "They asked me to add their names to the papers of another author," hinting that he would be compensated for the favor. Later, as his own 5-year review approached as a professor, an editor at an SCI Expanded journal offered him an author's slot on a paper in exchange for ghostwriting another paper.

Other editors say they have never heard of counterparts collaborating on paper-selling deals, and that for an editor at an internationally ranked journal the risks of being on the take are too high. "Many editors are trying hard to improve the quality of their journals, and they hate this kind of fraud," says the former Engineering Index journal editor. "Maybe a small group is engaged in this kind of activity." But, he continues, "It completely destroys the academic environment."

One seeming conduit for paid publication is the *Chinese Medical Journal*, an open-access journal published by the Chinese Medical Association. Agents at eight of the companies we contacted claim they can arrange publication in the journal, for fees ranging from \$1600 to \$4600. Until *Science* reached the journal's managing director, Wang Mouyue, by phone in late October, the "links" section on the journal's homepage featured the logo of Sciedit, a Guangzhou-based agency whose representative sent a *Science* reporter an abstract of a paper that was purportedly for sale. But Wang told *Science* it is "impossible" that *Chinese Medical Journal* editors take payments for ensuring a paper's publication. "China's paper-publishing market is very large, and there's every sort of agency imaginable out there. But our journal hasn't cooperated with any agency in order to sell articles." The Sciedit logo was later removed from the journal's website. A man who identified himself only as Mr. Wang and claimed to be Sciedit's owner declined to answer questions about collaboration with the *Chinese Medical Journal*.

Full service

Some agencies claim they not only prepare and submit papers for a client: They furnish the data as well. "IT'S UNBELIEVABLE: YOU CAN PUBLISH SCI PAPERS WITHOUT DOING EXPERIMENTS," boasts a flashing banner on Sciedit's website.

One timesaver: a ready stock of abstracts at hand for clients who need to get published fast. Jiecheng Editing and Translation entices clients on its website with titles of papers that only lack authors. An agency representative told an undercover *Science* reporter that the company buys data from a national laboratory in Hunan province.

For scientists who have qualms about attaching their names to data of questionable provenance, many agencies offer to write meta-analyses or review papers, based on already-published data. The fact that review articles can be written without gathering original data has

made them wildly popular in China, says Deborah Yang, marketing and sales director for China for Editage, a reputable international editing company, in Shanghai. From 2003 to 2011, the number of meta-analyses from China listed in PubMed increased more than 16 times faster than did meta-analyses from the United States, far outstripping the overall rise in papers from China. Sciedit's Mr. Wang says the reference on his agency's website to publishing without doing experiments refers to meta-analyses. "We don't write [papers], we just help with revisions and language polishing," he wrote in an e-mail to *Science*.

A customer service representative with H&G IES told an undercover *Science* reporter that the agency could write a paper and guarantee publication in an international journal. Reached by phone, Kevin Chang, chief editor at H&G IES, elaborated: "If a person doesn't have any data or an article, what we can do at the most is to write a review paper. ... We don't make up data." Chang was

more cautious in a later e-mail, stating that H&G IES provides only "editing and consulting services, not writing." The customer service representative, he explained, was "under-trained."

There may be less to many of these agencies than meets the eye. H&G IES's website advertises its "US Root, Global Reach" and, until *Science* reached Chang, claimed to have representatives serving France, Germany, Japan, Korea, Spain, and Vietnam. But its website includes content only in English and Chinese, and the lone telephone number listed until recently was a Google Voice number. Chang did not respond to questions about the company's size.

The Chinese paper-selling agencies also inhabit a murky legal space, as several agency representatives acknowledged in chats with an undercover *Science* reporter. But, at least in some cases, they seem to deliver on their promises. On 21 August 2012, Core Editing advertised authorship for sale on 12 papers listed on its blog. Eight were meta-analyses; the other four were original research. Of the dozen, at least two have since been published by Chinese authors in SCI journals.

Corresponding authors of the two papers—one published in *OncoTargets and Therapy* and the other in the *Canadian Journal of Neurological Sciences*—did not respond to repeated interview requests. An e-mail to the address connected to the QQ messaging service number on Core Editing's blog elicited this reply: "I apologize if the blog's content inadvertently violated certain writers' rights.... If the famous Science Magazine goes so far as to be interested in a personal blog, isn't it making a big fuss over a small issue?" The page advertising papers for sale has since been deleted.

In those two cases, the brokered papers had not yet been submitted, raising the possibility that any original authors may have transferred



the authorship to Core Editing's clients. In an e-mail to *Science*, Hans-Joachim Schmoll, editor-in-chief of *OncoTargets and Therapy*, wrote that his journal is investigating the paper and will consider retracting it if the investigation shows its authorship to be suspect. Robert Chen, editor of the *Canadian Journal of Neurological Sciences*, told *Science* that his journal will pursue a similar course of action.

Another common brokerage method is bringing on authors after a paper has gone through peer review. Such an approach takes advantage of journal policies allowing authors to be added at late stages—a change sometimes legitimately necessary because of issues raised by reviewers. Such practices have contributed to a boom in co-first authors and co-corresponding authors in China, says Cao Zexian—so common, he jokes, that they're “a Chinese invention.”

At the *International Journal of Biochemistry & Cell Biology*, the overhaul of the author list in the paper purportedly brokered by Wanfang Huizhi went unnoticed. Typically, if new authors are brought on, the corresponding author is expected to explain the change to the editor handling the paper. That didn't happen with the cancer paper, Joanna Kargul, the journal's managing editor, wrote in an e-mail to *Science*: “The authorship change slipped the radar of the reviewers and the handling editor.”

Outside China, ignorance of the methods used by agencies may prevent editors from spotting brokered papers. Schmoll notes that many editors struggle to evaluate the flood of papers from China: “We don't know the universities, we don't know the clinics, we don't know the research institutions.” He adds: We have to either reject everything or evaluate [papers] as normal.”

Winds of change?

At a publishing conference sponsored by the China Association for Science and Technology in Hangzhou last September and attended by editors from across China, Thomson Reuters' Stipp was the star of the show. As he clicked through PowerPoint slides explaining how journals are selected for the Web of Science, the broad citation database that encompasses SCI, audience members crowded the screen, snapping photos. A slide showing a huge leap in the number of Chinese journals listed brought hearty applause.

Globally, the past few years have seen a growing shift away from science's overreliance on impact factors. In May, 155 scientists from 78 scientific organizations signed the San Francisco Declaration on Research Assessment, a document drafted at the December 2012 meeting of the American Society for Cell Biology (*Science*, 17 May, p. 787). The declaration advocates abandoning the use of journal impact factors to assess individual researchers. Chinese science leaders are steering in that direction (see Editorial, p. 1019). Thomson Reuters is working with the National Natural Science Foundation of China, the science ministry's Institute of Scientific and Technical Information of China, and the Ministry of Education to introduce other evaluation measures for authors, such as total paper citations and number of patents awarded.

One way to more explicitly combat paper-selling is to beef

up authorship requirements. Following recurring revelations of pharmaceutical company ghostwriting at international medical journals over the past decade, several leading journals adopted more stringent standards, requiring that each author detail his or her involvement in the research upon submission. Some journals ask for one of the authors to serve as a “guarantor” of a paper's integrity and authorship from inception to publication. And editors say an increasing number of journals based in China warn authors that they are not affiliated with any paper-selling companies.

Basing academic evaluation on peer review rather than on impact factors would also curtail fraud, argues Jianwu Tang, an ecologist at the Marine Biological Laboratory in Woods Hole, Massachusetts, who conducts research part of the year in China. “In a specific field, our colleagues know pretty much what we are doing,” he notes. Others say that scientists caught in publication scams should face stricter punishments. For now, agencies and their clients are operating with impunity. Under China's current setup, says one editor, “what you gain [by buying papers] is more than you lose if you are found to commit academic fraud.”

As for the paper whose abstract the Wanfang Huizhi agent sent our reporter, the authors offered a range of explanations for the late

changes in the author list. Asked about the decision to add a second first author, corresponding author Wang Xuedong of the Fifth People's Hospital of Wuxi and the Affiliated Hospital of Nanjing Medical University in Wuxi responded in an e-mail: “The entire submission was prepared by the first author, so I'm not very clear about the situation you mentioned.” He explained that the first author had suggested adding as a co-first author a former classmate who had helped with the work. As to how the Wanfang Huizhi agent could have described authorship on the paper as for sale, he wrote: “We do not know through what channels the agency obtained the abstract to our paper.”

The original first author, Wang Qingping of Shaoxing Hospital of China Medical University in Shaoxing, denied that the authorship change had been his idea. Reached by telephone, he said, “The co-first author's name was added after discussion among the other authors. It was not my decision alone.” In response to an e-mailed copy of the abstract obtained from Wanfang Huizhi, he wrote that he was shocked at the suggestion that 90,000 yuan (\$14,800) had changed hands: “You don't mean [Japanese] yen?”

Wang Yu, the new first author whose name appears in the slot that the agent claimed was for sale, remains a mystery. The Southwest Hospital of the Third Military Medical University in Chongqing, listed on the paper as her affiliation, did not provide her telephone number. There's no trace of her online, apart from a few doctor review sites. The paper in the *International Journal of Biochemistry & Cell Biology* appears to be Wang Yu's first publication in an SCI journal. An unintended consequence was her debut in *Science* as well.

—MARA HVIStENDAHl

With reporting by Li Jiao and Ma Qionghui.

“IT'S UNBELIEVABLE: YOU CAN PUBLISH SCI PAPERS WITHOUT DOING EXPERIMENTS.”

—Banner on Sciedit's website