management — stopped after the Trump administration raised questions about Iran and the nuclear deal, says Glenn Schweitzer, who spearheaded the NASEM work in Washington DC.

"We were all full of enthusiasm when the agreement was signed, but unfortunately things went in the opposite direction," says Soroosh Sorooshian, an Iranian–American hydrologist at the University of California, Irvine. He was one of hundreds of scientists who participated in the NASEM workshops. "God knows what happens next."

MOTHBALLED

Iranian scientists have expanded collaborations with their European counterparts in areas such as nuclear safety and security, but similar work has failed to take root in the United States.

That is in part because some US sanctions remained in place in spite of the nuclear agreement, and because US researchers often need a licence from the US Department of the Treasury to collaborate with government scientists in Iran, says Matthew Bunn, who studies nuclear non-proliferation issues at Harvard University in Cambridge, Massachusetts.

Bunn is seeking such a licence to initiate a dialogue with leading nuclear scientists in Iran, with the ultimate goal of steering the country towards a safe and secure nuclear-energy programme. Trump's decision could detract from efforts to advance meaningful scientific cooperation, Bunn says, in addition to emboldening Iranian hardliners who would like to see the country become a nuclear power.

"There won't be a lot of enthusiasm on the Iranian side for dialogues with Americans."

"I need to rethink what I had been planning," he says. "There won't be a lot of enthusiasm on the Iranian side for dialogues with Americans such as myself."

Other research collaborations that could be in jeopardy include work at Fordow, an underground nuclear facility near Qom in northern Iran. As part of the JCPOA, Iran agreed to halt uranium enrichment at the facility. The country planned to pursue particle-physics research there, and to use the facility to produce medical isotopes. Russian scientists had been working with Iran on experiments to advance Iran's medical isotope production, says Scott Kemp, who heads the Laboratory for Nuclear Security and Policy at the Massachusetts Institute of Technology in Cambridge.

"I think that work gets mothballed, at least at the outset," Kemp says. And if the agreement collapses entirely and Iran walks away, he says that the country would scrap the effort altogether "and go back to making enriched uranium".

Sorooshian says the only good news is that the number of Iranian students entering US universities has increased in the past few years, which will help to build relationships between the two countries in the decades to come.

But for now, he says that the outlook for scientific cooperation between the two countries looks grim. "Everybody is concerned." ■

PEOPLE

Sacked Japanese biologist to retrain at Crick Institute

Yoshinori Watanabe hopes to revive his career with help from his former mentor.

BY DAVID CYRANOSKI

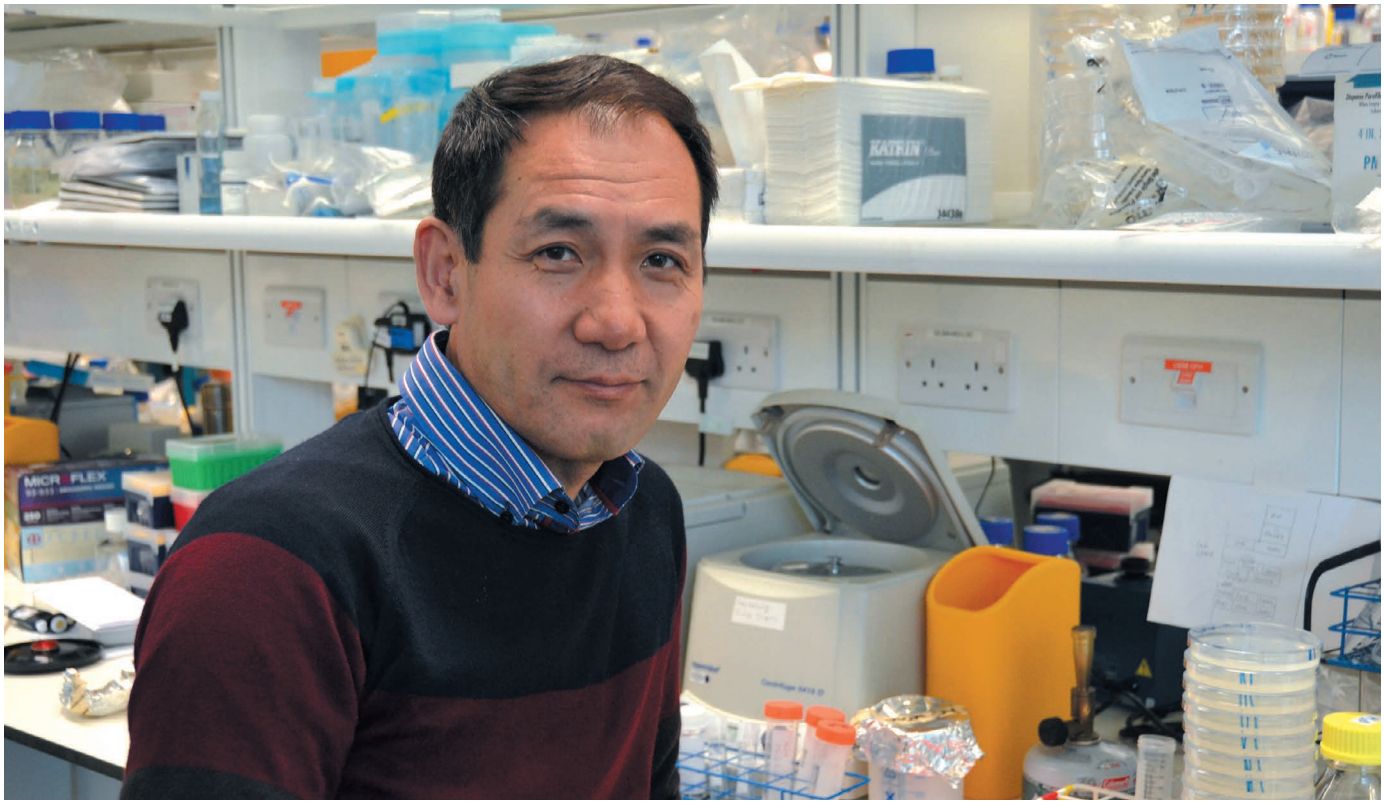
Prominent cell biologist Yoshinori Watanabe, who was dismissed by the University of Tokyo last month, is attempting to put his past behind him by embarking on an intensive retraining programme with Nobel prizewinner Paul Nurse in London. The university dismissed Watanabe after an investigation concluded that he had committed scientific misconduct.

Watanabe, who has done groundbreaking work in chromosome biology and has a string of impressive scientific achievements to his name, arrived at Nurse's laboratory on 16 April. Watanabe says the programme will focus on data acquisition and presentation, and also involve experiments. "After that period of retraining, I hope that I will be able to find somewhere to continue my research career," he says. Watanabe told *Nature* that he made mistakes in scientific papers, but that he did not intend to deceive and that he thinks these errors do not amount to serious misconduct.

Programmes to retrain errant scientists are rare. A rehabilitation initiative run by ethicist James DuBois at Washington University in St Louis, Missouri, with support from the US Office of Research Integrity, trained 61 researchers between 2013 and 2017. Participants who are referred to the programme have generally made careless mistakes, failed to provide adequate oversight, or not complied with policies on the treatment of human research participants, animal welfare or the declaration of conflicts of interests. But few of the rehabilitation participants have been accused of manipulating data, as Watanabe was.

Nurse, who mentored Watanabe when he was a postdoctoral researcher in the 1990s, thinks that the biologist deserves the

MATTHEW BUTT/CRICK INST.



Yoshinori Watanabe, who has done groundbreaking work in chromosome biology, will attend a retraining programme in London.

opportunity to redeem himself. "The research community and institutions need to think more about how to handle rehabilitation in cases like this," says Nurse, a cell biologist and director of the Francis Crick Institute in London. Nurse declined to comment further on the retraining. A spokesperson for the institute says that "it isn't part of a formal approach being taken by the Crick. It's a one-off situation — Paul Nurse agreed to give Dr Watanabe an opportunity for retraining."

SOUND RETRAINING

Frank Uhlmann, a cell-division researcher at the Crick, has been advising on Watanabe's retraining. He suggests that Watanabe's experiments at the Crick include the use of automated image-acquisition and analysis tools, and a double-blind laboratory set-up that conceals from the experimenter which data are the tests and which the controls. Watanabe told *Nature* he intends to do both.

Bill Earnshaw, a cell biologist at the University of Edinburgh, UK, says he is happy that Nurse is giving Watanabe this opportunity. "But whether this will succeed, only time will tell — as I know of no precedent for this. I am supportive and cautiously optimistic," he says.

Watanabe says he is excited about the opportunity to retrain at the Crick, but thinks it will be a challenge to secure a new research position.

After a career spanning more than three decades, Watanabe's experiments continue to form the bedrock of scientists' understanding of how proteins drive the separation of chromosomes when cells divide. "His major findings have been correct and influential," says Arshad Desai, a cell biologist at the University of California, San Diego.

But last August, the University of Tokyo announced that five of Watanabe's papers contained manipulated images and improperly merged data sets that amounted to scientific misconduct. One of those papers has since been retracted and two have been corrected. Two others have corrections under consideration, according to Watanabe. Another university investigation into nine other papers found no evidence of misconduct.

> ***"Should Paul urge Watanabe's rehabilitation, then I think there's some hope Watanabe will be able to return to science."***

Watanabe says that the university's investigation made him aware of "issues concerning contrast in pictures and checking original imaging files". He says, however, that he did not intend to deceive and that the issues did not affect the main conclusions of the papers. Although Watanabe resigned from the university on 28 February this year, his official dismissal from the university means he will not receive a pension.

SECOND CHANCE

Many of Watanabe's colleagues think he deserves an opportunity to make amends. Julia Cooper, a molecular biologist at the US National Cancer Institute in Bethesda, Maryland, says that data manipulation is never acceptable. But she thinks the sanctions were too harsh and incommensurate with the degree of wrongdoing. "Yoshinori absolutely deserves a second chance," she says.

SENSITIVE SITUATION

Several people contacted by *Nature* did not want to be quoted, citing either the sensitive nature of the situation or its complexity. But most have faith in Nurse's judgement. "Should Paul urge Watanabe's rehabilitation, then I think there's some hope Watanabe will be able to return to science," one researcher said. Another expects that Watanabe's retraining will be successful.

Despite helping to design Watanabe's rehabilitation programme, Uhlmann is unsure whether it will make a difference. He commends Watanabe's willingness to engage with his retraining, but says "we will only know at the end of it whether his heart is where his mouth is".

Watanabe emphasizes that his willingness to embark on the training and acknowledgement that he made errors is evidence that he will change his ways.

Silke Hauf, who was one of Watanabe's postdoctoral researcher and is now a cell biologist at Virginia Tech in Blacksburg, says that Watanabe deserves another chance, but is likely to struggle to regain his career even after retraining. "No institution wants to give the appearance of fostering misconduct," she says, "but allowing people to rectify mistakes must be part of a scientific culture." ■