Science misinformation alarms Francis Collins as he leaves top NIH job

This month, Francis Collins will step down as director of the US National Institutes of Health (NIH) after more than 12 years leading the agency, the world's biggest public funder of biomedical research. A former head of the Human Genome Project, he championed similar bold, big-budget science efforts, such as the All of Us Project, which aims to study health data from one million people. He led the NIH under three US presidents, steered it through a roiling pandemic and faced myriad clashes over politics and biomedical science. Collins will stay on at the NIH to continue genetics research in his lab. He spoke to *Nature* about some highlights of his time at the helm, and issues facing the agency in the future.

Which achievement will you cherish most?
It's really hard to pick one. Maybe it's where it was possible to bring together scientists of multiple disciplines and organize a truly bold, audacious project that would simply not have happened if one just counted on it coming together passively. I'm thinking of the BRAIN Initiative. I'm thinking of what we did with precision medicine and the All of Us Project, with the organized effort to develop COVID-19 vaccines in less than a year, and to develop diagnostic platforms for COVID-19 on similarly breathtaking timetables. Those are all things I feel proud of.

Are there projects you're disappointed you didn't get to finish?
Our efforts in diversity. I think we made some real progress there. I appointed my chief officer for scientific workforce diversity — and there's everything we're doing as far as recruiting, and as far as making sure our clinical trials are focused on diversity. But here we are in 2021, and if you look at our workforce, we are still woefully under-represented for people of colour. That's not what the NIH should look like. We are losing out on talent; we're losing out on productivity that we know comes from diversity. We've pushed hard on this during my time as NIH director, and we have made some progress, but we've got a long way to go.

US President Joe Biden's administration aims to launch ARPA-H, a multibillion-dollar agency, to accelerate research in science and health. It is supposed to be housed within the NIH. How would you gauge its success in two years' time?
By then, we should certainly have recruited and installed a visionary director who has the appropriate attitude towards risk taking. That person should have been able to bring on board 50 to maybe 100 project managers who know how to identify projects that fit the ARPA-H model — projects that simply aren't getting done otherwise, and could be accelerated considerably if funded through this mechanism. I want to see some significant evidence of successes, but also some significant evidence of failures. Because if there aren't some failures — and they need to fail early — then they're not being risky enough.

Observers have commended your ability to gain bipartisan support for the NIH among leaders in the US Congress. How do you do it?
First of all, I've tried my darnedest to stay out of any kind of political wrangling. I'm not a member of any political party. I've really endeavoured to make friends across the aisle and in both houses of Congress. Relationships really matter. I have this incredibly positive message to share with members of Congress. I can come to a meeting — and I would bet I've had 1,000 of those in these 12 years — with information about medical research that might advance the cause of preventing or treating a terrible disease. And they're all concerned about that — for themselves, their families, their constituents. So most of these are incredibly positive experiences because of the topic, and because I'd make every effort to make the information accessible and not get all tangled up in a lot of jargon and complicated words.

> **"We seem to have lost a sense of how to tell the difference between a fact and an opinion."**

What would it take for the next NIH director to succeed at this?
It takes investment. The next NIH director needs to count on spending maybe a day every week interacting with leaders in the administration, and especially Congress — because they ultimately decide the budget — to build those relationships of trust. Then you know, when you sit down with a senator, that you've got this background of having had conversations — not always easy ones, because sometimes senators want things that we can't provide. But you also know that you're going to speak the truth to each other, and then everybody's bringing their best to that interaction.

The NIH faced criticism when it placed restrictions on fetal-tissue research during Donald Trump's presidency. Do you stand by the agency's actions?
I think it's widely known that the NIH tried to protect the continued use of human fetal tissue. But ultimately, the White House decided otherwise. And we had no choice but to stand down. That is how the government works. Now that we have a different administration, that has changed.

One can learn from fetal tissue, important things that might ultimately save lives. There is the reality that in this country, pregnancy terminations are legal, and so there are lots and lots of fetal tissues being discarded every day. I've tried to make the case, as a Christian and somebody who really does think that human life is sacred, that it is more ethical to utilize some of these fetal tissues occasionally, in a way that might benefit somebody, than to put them into the incinerator. That doesn't win me friends in some constituencies, and it certainly didn't win the day in the Trump administration.

In 2018, biophysicist He Jiankui shocked the world when he announced that twins had been born from CRISPR-edited embryos. Some researchers were aware of the work before it grabbed headlines. Do you think researchers have an obligation to raise an alarm about work that crosses legal or ethical lines?
I do think they have a role. We are not just technicians. We are also supposed to be people who have a moral compass, and if something is happening in biological research that crosses that line into territory that, in general, we as the human species have concluded shouldn't be happening, then it's up to us to point that out. I was not one of those who knew that this experiment was going on. The whole thing was

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Genome leader Francis Collins has been head of the US National Institutes of Health since 2009.

complicated by the fact that we don't have an international body that basically sets these kinds of ethical rules. This is one of the things that vexes me a bit. And I don't see it as likely that that's going to emerge anytime soon, given the fact that countries don't seem to be able to agree on a lot of things.

Some say the US government's efforts to prevent espionage under the 'China Initiative' amount to racial profiling. The NIH has cooperated with these efforts and clarified guidelines for scientists reporting foreign funds and appointments. Should anything change in the government's approach?
We're simply trying to identify places where people are doing things that are wrong. And recognizing that we have to act when we see that. I think we have to, when we approach what appears to be a troubling situation, try to start with giving the [research] investigator the benefit of the doubt that there was a careless failure to report something that should have been reported. I think that's what we are doing, and only when it becomes clear that there is an intentional distortion of the facts and intentional effort to physically hide information should we then be taking hard actions. We're working with our grantee institutions, because it's really their job to figure out what to do with their employees. We depend on them to decide what the appropriate action is.

It has been reported that NIH grant recipient EcoHealth Alliance, based in New York City, might have conducted what some virologists would consider 'gain of function' research conferring new abilities on coronaviruses. Experts have said the NIH allowed EcoHealth unusual latitude in that work. How would you characterize it?
This term 'gain of function' has caused so much confusion and so much misunderstanding, some of it rather intentional, to distort the facts of what happened. Which is why we're trying to just avoid the use of that term. Let's talk instead about 'enhanced pathogens of pandemic potential'. [EcoHealth was] not crossing the line into the area that required that extensive kind of oversight, as was ultimately put forward in the US government's P3CO [Potential Pandemic Pathogen Care and Oversight] guidelines. I think we, at this point, are incredibly transparent. It took a little while to get there because of concerns about setting precedents for revealing information that we normally don't share about interactions between us and the grantee. I will be quick to say [the research] has nothing to do with the origin of SARS-CoV-2. I don't know what more we could be sharing.

You've watched science and politics collide for years. Do you believe politicization of science has grown worse?
It is much worse. And it's a reflection of the fact that polarization is much worse — and tribalism is much worse. We're in a really bad place. If science happens to produce a result that a political perspective doesn't like, then science has to be attacked. That's exactly what we see now happening, to the detriment of getting the facts out there.

What role does the NIH have in pushing back against misinformation about science?
This has turned out to be a much more severe situation than I would have imagined a year ago. I wish we had more insights from behavioural social-science research into how this has come to pass, and why it could have gotten so completely widespread. I want to call this out as one of my most major concerns as I stepped down from the NIH, of looking at the situation in our nation. Somewhere along the way, our political hyperpolarization began having a lot of really dangerous consequences, where in many instances we seem to have lost a sense of how to tell the difference between a fact and an opinion — or some Facebook post that's, frankly, a lie. That's truly dangerous. That's another epidemic that is not going to go away even if we triumph over COVID-19. We need to figure out what happened here, and how to bring ourselves back to a place where our nation has a more stable future.

Interview by Nidhi Subbaraman
This interview has been edited for length and clarity.