either an mRNA vaccine or AstraZeneca's first-generation viral-vector vaccine. "We're definitely practising with this one, but we are also developing it, and if it's successful, we will have it ready to use," says Mene Pangalos, executive vice-president of biopharmaceuticals research and development at AstraZeneca.

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## Real-world effectiveness

Determining the true efficacy of variant vaccines will be difficult. In regions where COVID-19 vaccine trials are well established, it can be hard to find volunteers who have not yet received a vaccine, yet are willing to enrol in an experimental trial of a new one. There might also be ethical concerns around recruiting placebo groups for randomized controlled trials, given that effective vaccines are available.

"If we're not going to do randomized controlled trials for efficacy, one alternative would be to do immunogenicity studies, plus really robust, well-designed real-world effectiveness studies," says Matthew Hepburn, who until August was the director of COVID-19 vaccine development at the US government's Countermeasures Acceleration Group (formerly Operation Warp Speed) and is now a special adviser at the White House Office of Science and Technology Policy.

Immunogenicity studies would measure the immune responses triggered by variant vaccines — for instance, an increase in antibody or B-cell levels — and compare those with the effects of the first-generation vaccine. That seems to be where some vaccine makers are heading: on the basis of guidance from European regulators, AstraZeneca will use this approach in its Beta-vaccine trial.

Moderna is also focusing on immunogenicity data, and is collaborating with a hospital system in Southern California to collect real-world data on vaccine effectiveness. In these observational studies, participants can choose whether they get a vaccine or not, and researchers monitor the two groups to see how they fare. Such studies "aren't perfect", concedes Miller, because the two groups might have different behaviours and risk factors.

How public-health authorities will determine that a variant has escaped — and therefore that the world needs a new COVID-19 vaccine — isn't yet clear. Pangalos offers one way to measure that: "If we start to see lots of people going into the hospital that have been vaccinated, then we have a problem," he says. "But right now, we're nowhere near that."

Miller hopes that the process of updating a COVID-19 vaccine will eventually become as streamlined as changing an influenza vaccine, which typically doesn't require much in the way of clinical studies. And because RNA vaccines can be manufactured more quickly than can conventional jabs, she adds, "the idea would be to make that switch even more rapidly than we're able to do with flu".

Q&A

# 'Politicians shouldn't meddle': new chief of Europe's major research funder

**On 1 November, developmental geneticist Maria Leptin will become president of the European Research Council (ERC), Europe's premier funding agency for basic research.**

**What are your top priorities as incoming president?**
The ERC is a fantastic organization with fantastic aims and a fantastic staff. I wouldn't dream of coming in and saying we have to change everything. My first aim will be to keep the ERC stable and emphasize its strength. Of course, there are always things that can be improved, such as attaining broader public engagement. The ERC's service to the scientific community might need tweaking, because different fields have different needs.

**The ERC aims to be independent from politics. What is your plan to keep the ERC true to its founding mission?**
I'm hoping this doesn't need a plan. We have sufficient examples to remind people of how important it is not to meddle with the autonomy of basic research. Everybody recognizes that COVID-19 vaccines were developed so fast because a range of fields, which had been receiving basic-research funding for a long time, suddenly came together. It illustrates that necessary and topical science comes bottom-up from the best scientists.

**How will you promote the value of basic research?**
That's really not easy, and I wouldn't say I have a recipe. The ERC budget is decided by European Union member states and the European Parliament, and parliamentarians listen strongly to their home constituencies. It's clear that the public needs to realize what basic research is about and what it does for them. We will have to think very hard about new routes to get to the public — and it's not just going to be senior people giving lectures. One way to get there is working with locally engaged media experts to reach the people who need to be reached.

**Do you envision special ERC programmes, such as on climate or COVID-19 research?**
I would not go for top-down research. We have programmes for that, including the European Innovation Council and the rest of Horizon Europe, the EU's seven-year research programme.

**ERC funding is very sought after by early-career scientists, but success rates for starting grants are low (13.5% in 2020). How will you keep young researchers happy?**
Well, I think all researchers should be kept happy. Of course I'd like to be able to fund more of them. I also would like to not let them fall off a cliff after getting their first starting grant, when they apply for consolidator or advanced grants and find out that it's even tougher to get one (2020 success rates were 13% and 8%, respectively). For every funding call, there are lots of good proposals that cannot be funded. I really would like the award rates to go up, but there's only two ways to do this: either fewer applications or more money.

**The United Kingdom and Switzerland are still negotiating access to Horizon Europe. What does this mean for grant applicants from these countries?**
We are all desperately hoping that Switzerland and the United Kingdom will associate with Horizon Europe. We care about our colleagues in these countries and their science, and we want them in the ERC. At the moment, UK-based researchers can apply for funding, but grants can be awarded only once the association agreements have been signed.

**Do you think it would be better to keep politics out of science?**
It's the prerogative of elected governments to determine what goes on in their constituencies, and if science is part of that, they should have a say. But politicians who are not trained in science should not meddle in our day-to-day business, or tell scientists what's right or wrong. I would see it as my duty to explain to politicians what's best, and to get them to realize that. They distribute the money, so we have to make them understand what's good for people, rather than say, "Just stay out."

**Interview by Quirin Schiermeier**
This interview has been edited for length and clarity.