set of projects. This year, evaluators were also asked to focus on a project's risk to a greater extent than in previous years. (A spokesperson for the ERC said that the council is still refining the assessment's methodology.)

The 19% figure for scientific breakthroughs in the latest assessment is lower than in previous years: 21% and 25% of ERC projects assessed in the 2015 and 2016 exercises, respectively, were classed as such (see 'Europe's top research grants').

The reviewers concluded that most projects that made breakthroughs were high risk and high reward, and only 10% of projects were considered low risk. "The ERC has really pushed the expectation of raising the boundaries of science and taking more risks," says Jan Palmowski, secretary-general of the Guild of European Research-Intensive Universities, a lobby group in Brussels.

"The ERC has really pushed the expectation of taking more risks."

The assessment shows that risk-friendly funding is crucial for retaining talent in Europe, where research funders are generally risk-averse, says Martin Vechev, a computer scientist at the Swiss Federal Institute of Technology in Zurich who received an ERC grant aimed at early-career researchers in 2015, after spending time at computing firm IBM in the United States. The grant encouraged him to stay in Europe, and he says that the funding helped his team to develop a new subfield of artificial intelligence that focuses on machines that automatically write computer code.

The reviewers also said that more than 50% of projects had already made an economic and societal impact. In a speech earlier this year, ERC president Jean-Pierre Bourguignon said that council-funded research generated 29% of patents approved through EU funding in 2007–13, despite receiving less than 17% of the money.

FUNDING INCENTIVE

The review comes at a crucial time for EU research funding, say observers. This week, the European Commission is expected to release a detailed budget plan for the next instalment of its main funding programme, which will include the ERC's next pot of money. The programme, called Horizon Europe, will run from 2021 to 2027 and has a proposed budget of nearly €100 billion (US$117 billion).

The latest review provides ammunition in the fight to raise the ERC's budget, says Palmowski. His organization is advocating for a doubling of the annual budget, which in 2017 was €1.8 billion; it started at €300 million in 2007. ■

VILNIUS UNIV. (LEFT)/HALLBAUER&FIORETTI FOTOGRAFIE (MIDDLE)/UC BERKELEY (RIGHT)

Virginijus Siksnys, Emmanuelle Charpentier and Jennifer Doudna won the 2018 Kavli nanoscience prize.

AWARDS

Kavli prize recognizes scooped biochemist

Virginijus Siksnys shares award for CRISPR contributions.

BY GIORGIA GUGLIELMI

CRISPR has hauled in yet another big science award, and this time the recognition includes a scientist whose contribution has sometimes been overlooked.

Two biochemists widely credited with co-inventing the gene-editing technology, Emmanuelle Charpentier and Jennifer Doudna, were named on 31 May as the winners of this year's Kavli Prize in Nanoscience. So was Virginijus Siksnys, a Lithuanian biochemist whose independent work on CRISPR has thus far garnered much less mainstream attention — and Nobel-prize buzz — than that of Charpentier, Doudna and some other scientists.

Researchers working on the mechanism of hearing and on the formation of stars and planets also won Kavli prizes this year, in neuroscience and astrophysics, respectively.

The Kavli Foundation — established by the late Norwegian philanthropist Fred Kavli in Los Angeles, California — and the Norwegian Academy of Science and Letters in Oslo announced the three biennial prizes, each of which comes with US$1 million to be split between the winners. First awarded in 2008, the prizes honour seminal research selected by three panels of experts from six global science societies and academies.

The nanoscience committee awarded the prize to Charpentier at the Max Plank Institute for Infection Biology in Berlin, Doudna at the University of California, Berkeley (UC-Berkeley) and Siksnys at Vilnius University in Lithuania "for the invention of CRISPR-Cas9, a precise nanotool for editing DNA, causing a revolution in biology, agriculture and medicine".

In 2012, a group led by Charpentier and Doudna[1], and several months later one led by Siksnys[2], reported programming the CRISPR–Cas9 system to cut DNA at specific sites. Since then, award committees, the media and some in the scientific community have emphasized the roles of Doudna and Charpentier in developing the transformative gene-editing tool. In 2015, the pair shared the Breakthrough Prize in Life Sciences, worth $3 million, for example.

But Siksnys's work on CRISPR has occasionally been overlooked. The Kavli nanoscience committee recognized that the three researchers conducted "key pioneering work" in the development of CRISPR-based genome editing, says chairman Arne Brataas, a physicist at the Norwegian University of Science and Technology in Trondheim.

Siksnys says he was "surprised" when a phone call from Oslo announced that he would share the Kavli prize with Doudna and Charpentier. "You don't expect such calls every day," he says. He adds that he is still disappointed it took so long to publish his results. *Cell* rejected his ▶

paper in April 2012 without sending it out for peer review; Doudna and Charpentier submitted their work two months later to *Science*, which fast-tracked it for publication. The Kavli prize is "a good example that you can achieve your goals and get recognition", Siksnys adds.

"This is a well-deserved prize for three individuals whose discovery made an enormous impact on modern biology," says Rotem Sorek, a microbial geneticist at the Weizmann Institute of Science in Rehovot, Israel. Sorek is not surprised that Siksnys shared the prize. "In the field of CRISPR, he is well known as one of the pioneers of the technology."

"It's nice that the recognition is being spread around," adds Dana Carroll, a biochemist at the University of Utah in Salt Lake City. But he notes that many others have also contributed to the development of CRISPR.

Synthetic biologist Feng Zhang, at the Broad Institute of MIT and Harvard in Cambridge, Massachusetts, has also shared in the accolades. His team was among the first to apply CRISPR gene-editing to mammalian cells, including mouse and human cells[3]. "There's the tendency to pick the principal investigators," says George Church, a geneticist at Harvard Medical School in Boston, Massachusetts, whose team also deployed CRISPR in human cells[4]. Young researchers such as the students and postdocs who turned CRISPR into a powerful gene-editing tool tend to be ignored, he adds. But Church also says that more attention should be paid to other DNA-editing tools — for example, zinc-finger nucleases — some of which are already finding use in medicine and agriculture.

EARS AND STARS

The neuroscience award went to geneticist Christine Petit of the Pasteur Institute in Paris, and neuroscientists Robert Fettiplace at the University of Wisconsin–Madison and James Hudspeth at the Rockefeller University in New York City, "for their pioneering work on the molecular and neural mechanisms of hearing". The researchers independently investigated the role of hair cells in the inner ear. These cells, which are covered in microscopic hair-like projections, detect sound signals and transmit them to the brain[5].

"This is a well-deserved prize for three individuals whose discovery made an enormous impact."

Ewine van Dishoeck, winner of the astrophysics category, works in astrochemistry at Leiden University in the Netherlands, where she has made her mark "elucidating the life cycle of interstellar clouds and the formation of stars and planets", according to the prize citation.

Her work combines theoretical studies with observations — especially, those made with infrared spectroscopy — and laboratory experiments to understand how compounds form in space, including the organic molecules that might have been the building blocks for life. She has also used radio telescopes to study planet formation around other stars. Van Dishoeck is the president-elect of the International Astronomical Union, and will lead celebrations next year as the union celebrates its 100th anniversary.

The laureates will receive their prizes in Oslo on 4 September. ■

1. Jinek, M. *et al. Science* **337**, 816–821 (2012).
2. Gasiunas, G., Barrangou, R., Horvath, P. & Siksnys, V. *et al. Proc. Natl Acad. Sci. USA* **109**, E2579–E2586 (2012).
3. Cong, L. *et al. Science* **339**, 819–823 (2013).
4. Mali, P. *et al. Science* **339**, 823–826 (2013).
5. Fettiplace, R. *Compr. Physiol.* **7**, 1197–1227 (2017).

CORRECTION

The Editorial 'Smelting point' (*Nature* **557**, 280; 2018) misstated the amount of aluminium produced in 2017. It was more than 63 million tonnes, not 63,000.

And the Editorial 'False testimony' (*Nature* **557**, 612; 2018) gave the wrong numbers for the closed cases. The numbers of closed cases were 31 and 49, not 25 and 39.