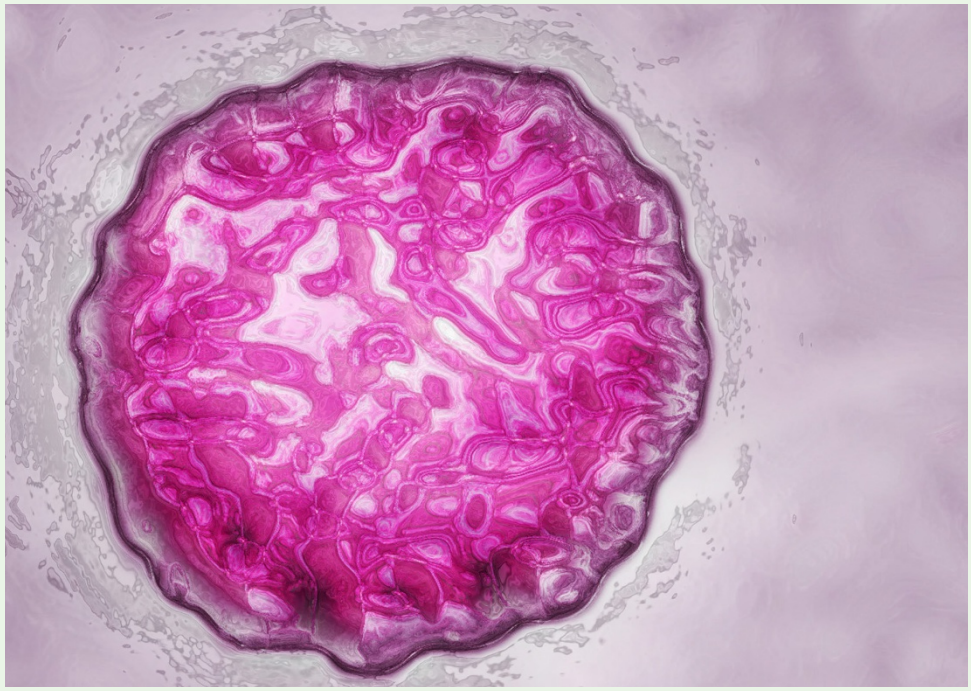
# Biomedical briefing

## RESEARCH

### Complete delete

On **18 April**, researchers from Sun Yat-sen University in Guangzhou, China reported the first attempt to edit the genome of human embryos (*Protein Cell.* **6**, 363–372, 2015). The team attempted to modify *HBB*, a gene that, when mutated, is responsible for the blood disorder called β-thalassemia, using a gene editing technique called CRISPR-Cas9. Although *HBB* was modified in all 86 embryos, many other genes were also unintentionally modified as a result of the technique. The study has sparked controversy about modifying the human germ line. "The key message from this study is that there are a lot of scientific issues with off-target cleavage by using this technology in embryos," Rudolph Jaenisch, a stem cell researcher at the Massachusetts Institute of Technology, told *Nature Medicine*. He says there are unresolved ethical questions about CRISPR-Cas9 modification of the germ line: "Even if we can do it, should we?"



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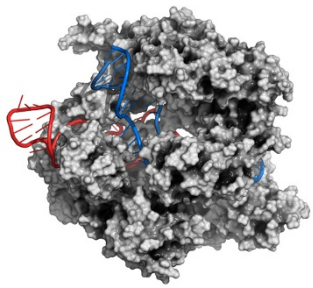
### Hep C listed

On **8 May** the World Health Organization (WHO) published its latest Model List of Essential Medicines (EML), which, for the first time, included six new drugs used to treat Hepatitis C infection. "Treatments for hepatitis C are evolving rapidly, with several new, highly effective and safe medicines on the market and many in the development pipeline," Marie-Paule Kieny, the WHO's assistant director-general for health systems and innovation, said in a press release. One of the new Hepatitis C drugs on the list is Gilead's Sovaldi (sofosbuvir), which costs $1,000 a pill or close to $84,000 per 12-week course of treatment, in developed countries. In addition to Sovaldi, the other therapies on the list include Olysio (simeprevir); Daklinza (daclatasvir), Exviera (dasabuvir), a combination therapy called Harvoni (ledipasvir and sofosbuvir) and another combination therapy called Viekira Pak (ombitasvir, paritaprevir, ritonavir and dasabuvir). A version of Viekira Pak, without dasabuvir and known as Viekirax, is also on the list. The WHO's EML is used as guidance in many countries with respect to what medicines they should make available.



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### Organoid screening

In a study published **7 May**, researchers from the Wellcome Sanger Trust Institute in Cambridge, UK and Hubrecht Institute in Utrecht, Netherlands, revealed that organoids derived from the tumors of cancer patients mimicked properties found in the real biopsies, making them useful for the screening of oncologic drugs (*Cell*, **161**, 933–945, 2015). The researchers grew 22 organoids derived from the tumors of colorectal cancer patients and found that the genomic mutations in the organoid cultures closely matched those in the corresponding tumors. The researchers also tested the organoids' responses to 83 experimental and approved cancer drugs and identified previously reported associations between specific mutations and resistance to particular drugs. "This is the first time that a collection of cancer organoids, or a living biobank, has been derived from patient tumors," Mathew Garnett, senior author of the study, said in a press release. "We believe that these organoids are an important new tool in the arsenal of cancer biologists."

### 'Tis the season

A new study published **12 May** suggests that gene expression varies seasonally (*Nat. Commun.* **6**, 7000, 2015). Of the nearly 23,000 genes that the University of Cambridge–based team studied in DNA from human blood samples, they found that the expression of more than 5,000 of them differed according to the time of year. For instance, genes found in white blood cells that are responsible for inflammatory responses were more active during the winter than in the summer. The researchers also found that genes associated with immune response to vaccination were more active in winter, possibly suggesting that

vaccination programs in the winter might offer better protection than in other seasons. "We know that humans adapt to changing environments," Chris Wallace, an author on the paper, said in a press release. "Our paper suggests that human immune systems adapt to show different seasonal variation in equatorial regions with fewer distinct seasons compared to regions at higher and lower latitudes with more pronounced differences between winter and summer."

## POLICY

### Spending data

Illustrating the high cost of drugs, total spending by the US national social insurance program Medicare and its beneficiaries on pharmaceuticals exceeded $103 billion in 2013, the most recent year for which data are available, according to a report released on **30 April**. The most commonly received drug was the blood pressure–lowering medication lisinopril, which was prescribed or refilled nearly 37 million times by individuals covered by Medicare. Fourteen of the more than 3,000 drugs prescribed under Medicare's Part D plans, which offer prescription drugs at a subsidized price, cost more than $1 billion each, accounting for nearly 25% of spending towards brand-name drugs. However, the data is "much more complex than initially meets the eye," says Robert Wah, President of the American Medical Association (AMA) in Chicago. Wah added that the AMA hopes the government will provide actionable information to physicians so they can implement payment models to improve patient care. Earlier this year, US President Barack Obama also asked Congress to allow Medicare to negotiate prices with drug manufacturers, a practice that is currently not allowed by law, to lower the cost of medications.

### Newly renamed

The members of the US National Academy of Sciences in Washington, DC, voted unanimously on **28 April** to change the name of the Institute of Medicine (IOM)—an independent nongovernmental institute that conducts research to help policymakers make decisions—to the National Academy of Medicine (NAM) this summer. This name change is part of a broader internal reorganization to better integrate the work done by the National Academies of Sciences, Engineering, and Medicine. "Health and all sciences are becoming so multidisciplinary that it's only going to be advantageous to have better integration across the Academies of Science, Engineering, and Medicine to enhance the strength of all our work," says Victor Dzau, president of the IOM. The NAM will inherit the more than 1,900 members of the IOM. Ongoing reports and studies in health and medicine under the IOM will continue uninterrupted when the institute's name changes on **1 July**.

### Writ reversal

On **20 April**, New York Supreme Court Justice Barbara Jaffe ordered Stony Brook University, which was holding two chimpanzees at a biomedical research facility, to provide reasons for the animals' detention, effectively granting the two animals a writ of *habeas corpus*, a Latin term for a court order to bring an imprisoned individual to court so that it can be determined that the person is being lawfully detained. The Nonhuman Rights Project (NhRP), an animal advocacy group, which filed the lawsuit against Stony Brook, had alleged that the two chimps, Hercules and Leo, were being unlawfully detained, further arguing that the chimps were too "cognitively complex" to be held in captivity and should be relocated. However, on **21 April**, Jaffe amended her ruling by striking out the words

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"writ of *habeas corpus*" on the document. Whether the chimpanzees continue to be at Stony Brook or not will be determined at a court hearing scheduled for **27 May.** In an e-mail statement, the University said that it "does not comment on the specifics of litigation, and awaits the court's full consideration on this matter."

### Watson expands

IBM announced on **5 May** that it would be teaming up with 14 cancer centers across the US so that its proprietary computer system, known as Watson, could better help doctors pick the right treatment for patients with cancer. Building on IBM's Watson Health Initiative, these collaborations will help match patients' DNA to therapy, hopefully relaying a faster and more successful approach. Without the use of a computer such as Watson, the process can take weeks. Researchers at IBM say that Watson will enable the process to take mere minutes, as the machine is capable of swiftly combing through scientific literature and clinical trials to arrive at potential therapies. "This collaboration is about giving clinicians the ability to do for a broader population what is currently only available to a small number—identify personalized, precision cancer treatments," Steve Harvey, vice president of the Watson Health Initiative, said in a press release.

### Tactful titling

The World Health Organization (WHO) in Geneva urged researchers and the media on **8 May** to be more careful when naming new infectious diseases and conditions so as to protect people and countries from unintended consequences. "The use of names such as 'swine flu' and 'Middle East Respiratory Syndrome' has had unintended negative impacts by stigmatizing certain communities or economic sectors," Keiji Fukuda, the WHO's assistant director-general for health security, said in a press release. The WHO also proposed a list of best practices when considering naming a new condition. These best practices state that a disease name should avoid geographic locations, as with Spanish flu, as well as the names of people, such as Chagas disease, and species of animal, as with bird monkey pox.

## DRUGS

### Ethical distribution

On **7 May,** New Jersey-based Johnson & Johnson announced that it had appointed Arthur Caplan, a bioethicist at New York University, to create a panel of doctors, ethicists, and consumer advocates that will make decisions about patients' requests for the compassionate use of its drugs. Johnson & Johnson says it is the first such instance of a pharmaceutical company appointing a third party to make decisions about compassionate use, a concept that allows patients with a serious or rare disease to gain access to drugs not already approved by the US Food and Drug Administration (FDA). "Many people, like the World Health Organization and the FDA, are watching to see if this panel will be useful," Caplan says. "I hope we can eventually get to a point where we can ask drug companies to expand access for compassionate care requests."