Technology held a hearing on human gene editing with witnesses who included Jennifer Doudna, a biochemist at the University of California, Berkeley, who was one of the inventors of the genome-editing system CRISPR, and the Institute of Medicine (IOM) president Victor Dzau.

The climate was more educational than controversial, with lawmakers asking the usual questions about the risks, benefits and ethics of engineering future generations of the human race. Parallels were drawn with another ongoing debate over 'three-parent embryos', in which an egg cell's diseased mitochondria are replaced with healthy mitochondria from a second woman. A decision on whether to allow that procedure in the United States is in the hands of the US Food and Drug Administration (FDA), which has commissioned an IOM report on the topic that is due this winter.

While the research and technology subcommittee grilled the experts, a separate subcommittee — of the House Appropriations Committee that funds the FDA — was meeting elsewhere on Capitol Hill to draft the agency's 2016 budget. The subcommittee wants to take no chances with human modification: a bill that it released on 17 June bans the FDA from using public funds to evaluate applications for clinical trials involving genetically modified human embryos. Ironically, the current wording could backfire: applications for permission to investigate new drugs are automatically approved in 30 days unless the FDA blocks them, which would require funds.

If the budget passes, this clause would be the first time that lawmakers have used the FDA to limit human embryo research. A 1996 law known as the Dickey–Wicker Amendment bans the use of federal funds to create human embryos for research, but does not pertain to FDA regulation. The National Institutes of Health (NIH) reaffirmed in April that heritable genetic modification falls under the Dickey–Wicker rule, and director Francis Collins said that clinical application of such technology is "viewed almost universally as a line that should not be crossed".

Nevertheless, Congress is determined to have a say. Deeply embedded in a report accompanying the appropriations bill are orders from the funding committee that the FDA appoints "an independent panel of experts, including those from faith-based institutions with expertise on bioethics and faith-based medical associations" to evaluate the IOM three-parent embryo report when it is released and to report back.

Although the FDA budget is far from becoming law — after undergoing another round of editing, it must still be passed by Congress and the Senate and signed by the president — the implication is clear. The powerful spending committee that holds the purse strings wants to be involved in the debate: an understandable and indeed necessary position. Still, even allowing for political posturing, the apparent pre-emptive distrust of the IOM's highly respected peer-review process is alarming. The perennially underfunded FDA has already spent US$1.17 million on the IOM committee, and although no budget is set aside for the new panel, it will soak up money that could be spent elsewhere. Also worrisome is the religious language, which harks back to 2010 when a court ruled in favour of religious organizations' interpretation of Dickey–Wicker and briefly shut down all NIH-funded human embryonic stem-cell research.

"This clause would be the first time that lawmakers have used the FDA to limit human embryo research."

As this journal has said, all voices, including those of faith-based groups, should be heard in the debate over human-genome editing; indeed, the input of highly influential religious groups is essential to make a decision on how and if to regulate, especially in the United States. But the IOM committee already includes a professor of religious studies — so why duplicate the effort? This mandate to the FDA is not one that should come from a secular government, which seems to be seeking to impress conservative supporters. As one ethicist put it: "It is a sign that the culture wars aren't dead."

When it comes to human-genome editing, however, those wars are a reality that all must face — and that is a good thing. This opening salvo from Congress shows just how complex the coming debate over human genomic modification will be. Academics have spent the past months debating among themselves how to proceed with research and clinical applications, sometimes acting as though they will be the arbiters of the final decision. As public awareness of the technology increases, that ethical discussion will rightly be taken out of their hands alone and planted firmly in those of broader society. ■

Light detective

Smartphone camera set to come to the aid of sleuths, scientists and wine lovers.

As any reader of detective fiction knows, a crucial clue needed to solve a murder is the time of death. The hero detective, typically, is frustrated by the vague responses of the forensics team: "sometime between Tuesday night and Thursday morning" does little to narrow down the range of suspects. Scientists have long tried to help. And forensic science, with DNA analysis at the forefront, now ensures that more real-life criminals can expect a knock on the door, sometimes decades after they thought they had evaded detection. However, it remains effectively impossible to accurately judge the age of a bloodstain. Corpse excluded, bloodstains are typically the most common piece of evidence encountered at a homicidal-crime scene.

Colour could be the key. After blood leaves the body it starts to dry; as it does so, it changes from red to brown. Back in 1907, the Italian researcher Louis Tomellini produced a chart of 12 bloody spots, to illustrate this colour change over a year. As forensic science developed through the twentieth century, so did bloodstain analysis. By the 1960s, researchers were using photospectrometry, recording reflectance spectra and working out how the rate of Tomellini's colour changes could be affected by different atmospheric conditions. These are useful observations, and forensic analysis of the colour of bloodstains is today a common part of the forensics team's work. But the results are still too variable for the analysis to stand up in court.

Colour provides more-useful data than many might think. Spectrometry is a valuable technique in many areas, from drug discovery to environmental monitoring. And astronomers use spectrometers to probe the atmospheres of distant exoplanets for conditions that might support life. Spectrometers, in other words, have become indispensable instruments. But they tend to be expensive, complex machines. The most precise can also be bulky, making them difficult to use in the field. On page 67 of this issue, scientists describe a possible step forward. They have built an optical spectrometer that is both small and powerful, and potentially cheap enough to find use in consumer electronics — to detect corked wine perhaps.

Like many modern images, those analysed by the scientists are taken with a smartphone camera. These are selfies from the quantum world: the camera is converted into a spectroscope using suspensions of particles called colloidal quantum dots. Exposed to light, these tiny particles produce vivid colours, with the shade and hue determined by the particle size. With the right mixture of particles, a coating can be applied that can filter and analyse the wavelengths (and so colour) of incoming light.

The research is discussed in a News & Views article on page 39, which describes how it could be used to produce "ubiquitous sensing elements in household devices connected to the Internet". Beware would-be bloody criminals, your fridge is watching you. ■

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