and detailed, and that the organization does not plan to review the findings. "We believe Mr Kibling carried out a thorough and independent investigation as he was tasked to do," he says.

The Sanger employs almost 1,000 scientists and other skilled professionals, and played a key part in the Human Genome Project, which concluded in 2003.

On 30 October, GRL released a redacted executive summary of Kibling's investigation report. The summary said that the investigation considered "various whistleblowing concerns" in a document submitted by one staff member that alleged that the institute and its director, the geneticist Mike Stratton, had committed gender discrimination, wrongful exploitation of scientific work for commercial purposes and misuse of grant monies. The summary also says that the investigation considered an allegation that Stratton had bullied someone. And it says that Kibling, of Matrix Chambers in London, cleared Stratton and the Sanger's management of all these accusations.

The authors of the 2 November statement are Nik-Zainal; Inês Barroso, a human geneticist who has worked at the Sanger since 2002 and who says she wrote the initial whistle-blowing complaint; Jyoti Choudhary, a proteomicist now at the Institute of Cancer Research in London; and three people, including a former member of the senior management team, who wish to remain anonymous to protect their careers.

Their statement questions the level of information that the investigation considered. It also questions the investigation's finding that there is no evidence for some allegations, and suggests that this might be because crucial evidence fell outside the scope of the investigation.

In his summary, Kibling notes that he was not required to determine the merits of any individual's grievance "which are not in the nature of a whistleblowing complaint or advanced by others" — and that such grievances are to be dealt with in a separate process.

Kibling told *Nature* that he stands by his investigation, and it was his "judgement call" to decide who would assist him and therefore who to interview. "The investigation needs to be proportionate and focused on the whistle-blowing complaint made and not the individual grievances that some of those I spoke to harboured," he says. He adds that he believes that he spoke to those who had a valuable contribution to make and were necessary for the investigation.

The investigation did identify failings in how people have been managed at the Sanger, and a lack of diversity at senior levels of the organization. The 2 November statement acknowledges these findings, but the authors still say that they are "disappointed by the investigation process".

They call on the Wellcome Trust in London, which owns the Sanger, "to reconsider whether the principles of this investigation lived up to its own standards".

Wellcome says that it is "satisfied with the investigation that has been carried out", and has no plans to reopen the probe.

Stratton did not respond to *Nature*'s request for comment. ■

NEUROSCIENCE

'Invisible' mice reveal anatomical secrets

Technique that turns dead rodents clear uncovers surprising details about injury response.

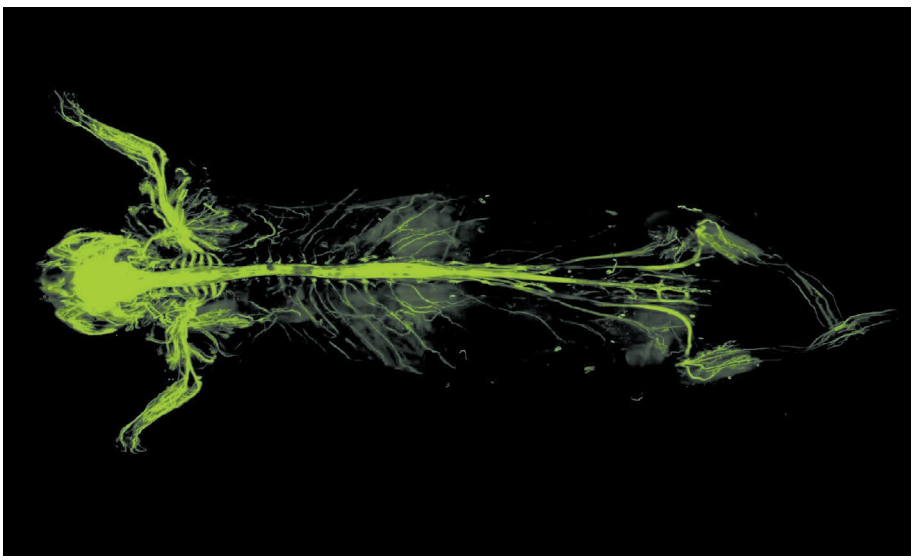
BY SARA REARDON

A new technique that makes dead mice transparent and hard like plastic is giving researchers an unprecedented view of how different types of cell interact in the body. Scientists can pinpoint specific tissues while scanning an animal's entire body.

The approach, called vDISCO, has already revealed surprising structural connections between organs, including hints about the extent to which brain injuries affect the immune system and nerves in other parts of the body. That could lead to better treatments for traumatic brain injury or stroke.

Methods that turn entire organs clear have become popular in the past few years, because they allow scientists to study delicate internal structures without disturbing them. But removing organs from an animal's body for analysis can make it harder to see the full effects of an injury or disease. And if scientists use older methods to make an entire mouse transparent, it can be difficult to ensure that the fluorescent markers used to label cells reach the deepest parts of an organ.

The vDISCO technique overcomes many of these problems. By making the dead mice rigid and see-through, it can preserve their bodies for years, down to the structure of individual cells, says Ali Ertürk, a neuroscientist at Ludwig Maximilian University of Munich in Germany, who led the team that developed vDISCO. He presented the work this month at a meeting of the Society for Neuroscience in San Diego, California.



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The nervous system of a mouse treated using the vDISCO technique glows green.

The process begins by soaking a mouse's body in organic solvents to strip it of fats and pigments. This preserves the structure of cells, even as the mouse shrinks by up to 60% (ref. 1). ▶

To explore the transparent mice, Ertürk's team developed a way to home in on specific cell types, such as neurons or cancer cells. The scientists turned to 'nanobodies': antibodies that are found only in llamas, camels and alpacas, and are one-tenth the size of antibodies in other species.

Nanobodies can be engineered to stick to specific proteins that are found only in one type of cell — while carrying fluorescent green markers to label the chosen cells. And because nanobodies are so small, they can easily pass through tiny blood vessels and into organs.

When the researchers pumped nanobodies into the circulatory systems of dead mice, which carried the molecules throughout the body, they could see individual cells glowing bright green under a microscope.

The technique is the first to make whole animals truly transparent, says Kwanghun Chung, a medical engineer at the Massachusetts Institute of Technology in Cambridge. "I think it's a fantastic technology," he says.

The first experiments with vDISCO have yielded surprising discoveries. One involves mysterious vessels that run between the skull and the brain, which were discovered only in 2015 (ref 2). When a team led by Ruiyao Cai, a neuroscientist in Ertürk's lab, used nanobodies to light up lymphatic vessels in a mouse treated with vDISCO, the vessels in the head glowed green — confirming scientists' suspicions that the structures are part of the system that transports lymph.

"I think it's a fantastic technology."

Cai and Ertürk also used vDISCO to test how severe injuries to the brain and spinal cord affect cells elsewhere in the body. Labelling neurons showed that nerves in a mouse's torso degraded after the animal suffered a traumatic brain injury, even though the nerve cells were far from the injury site. In another case, the scientists spotted immune cells that had rushed to the site of a spinal-cord injury days before a mouse died — and, unexpectedly, into surrounding muscle and lymphatic vessels[3].

The combination of vDISCO and nanobodies is "kind of the direction for the future", says Hiroki Ueda, a biologist at the University of Tokyo.

Ertürk next plans to use vDISCO to trace how viruses, cancer cells and other invaders spread throughout the body. His group is also designing machine-learning approaches to count and assess labelled cells without introducing bias or human error. ■

1. Pan, C. *et al. Nature Meth.* **13**, 859–867 (2016).
2. Louveau, A. *et al. Nature* **523**, 337–341 (2015).
3. Cai, R. *et al.* Preprint at bioRxiv https://doi.org/10.1101/374785 (2018).

The destruction of olive trees infected with a bacterium has caused controversy in Italy.

FABIO SERINO/ROPI VIA ZUMA

ITALY

Deadly olive-tree disease spreads

Measures meant to stop bacterium's expansion across Italy have been delayed multiple times.

BY ALISON ABBOTT

A vicious bacterium devastating Italy's valuable olive groves is still spreading years after it was identified, because of opposition to measures meant to contain the pathogen.

After months of inaction, authorities in the Puglia region have now resumed efforts to track the spread of *Xylella fastidiosa*, which causes a disease called olive quick-decline syndrome (OQDS) that cannot be cured or eradicated.

But scientists say the delays in implementing disease-containment measures — Italy declared a state of emergency over the outbreak in early 2015 — have added to the growing risk that the infection will spread out of the Puglian peninsula, which lies within the heel of Italy's 'boot', and towards olive groves in the country's main landmass.

Quarantine efforts — which environmentalists and farmers have frequently opposed — stopped again most recently in May. In the same month, the European Commission extended the 'certified infection zone' where the disease is present by 20 kilometres.

The delays have been a problem, says plant pathologist Maria Saponari of the Institute for Sustainable Plant Protection in Bari, Puglia's capital: "The later you detect an infection, the later you can start all the containment actions that are needed."

The budget now allocated by the Puglian government to begin tracking the bacterium again — €1.8 million (US$2 million) — also falls short of what is needed to implement the full set of containment measures agreed to by the Italian government and the European Commission four years ago.

Italy could now face legal consequences for its inaction, after the European Commission made good in May on its longstanding threat to refer the nation to the European Court of Justice for violating its quarantine regulations. If found guilty, Italy could, for example, lose