

In the news

TRANSPARENT MICE

At the California Institute of Technology, USA, scientists are, quite literally, seeing things more clearly thanks to a technique that they have developed that renders mice optically transparent. The ability to study individual cells and structures in intact organs within intact bodies has been hindered by the fact that lipids, which maintain organ structure, block light from passing through tissue. The group of Viviana Gradinaru sought to expand on previous protocols for 'clearing' tissues of lipids to develop a technique for whole-body clearing.

They first fine-tuned a method for passively extracting lipids from isolated organs while maintaining tissue integrity, which they called passive clarity technique (PACT): this involves introducing hydrogels to stabilize biomacromolecules in tissues and extracting lipids using ionic detergent. So that the diffusion of PACT chemicals was fast enough to enable whole-body clearing they then devised a protocol for delivering PACT reagents to mice via the vasculature, a technique that they refer to as perfusion-assisted agent release *in situ* (PARS). Karl Deisseroth, at Stanford University, USA, developed an earlier clearing method upon which PARS was built: "The published passive clearing methods were pretty good for whole adult mammalian organs", he said, "but this really enables the whole body, or whole embryo [to be imaged]." (*The Scientist*, 31 Jul 2014).

Importantly, the study just published in *Cell* also demonstrated that PACT and PARS are compatible with fluorescence-based techniques for visualizing endogenous proteins and RNAs, validating their ability to generate invaluable biological models. Gradinaru, senior author of the study, said "Our methodology has the potential to accelerate any scientific endeavor that would benefit from whole-organism mapping, including the study of how peripheral nerves and organs can profoundly affect cognition and mental processing, and vice versa." (*The Independent*, 1 Aug 2014).

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