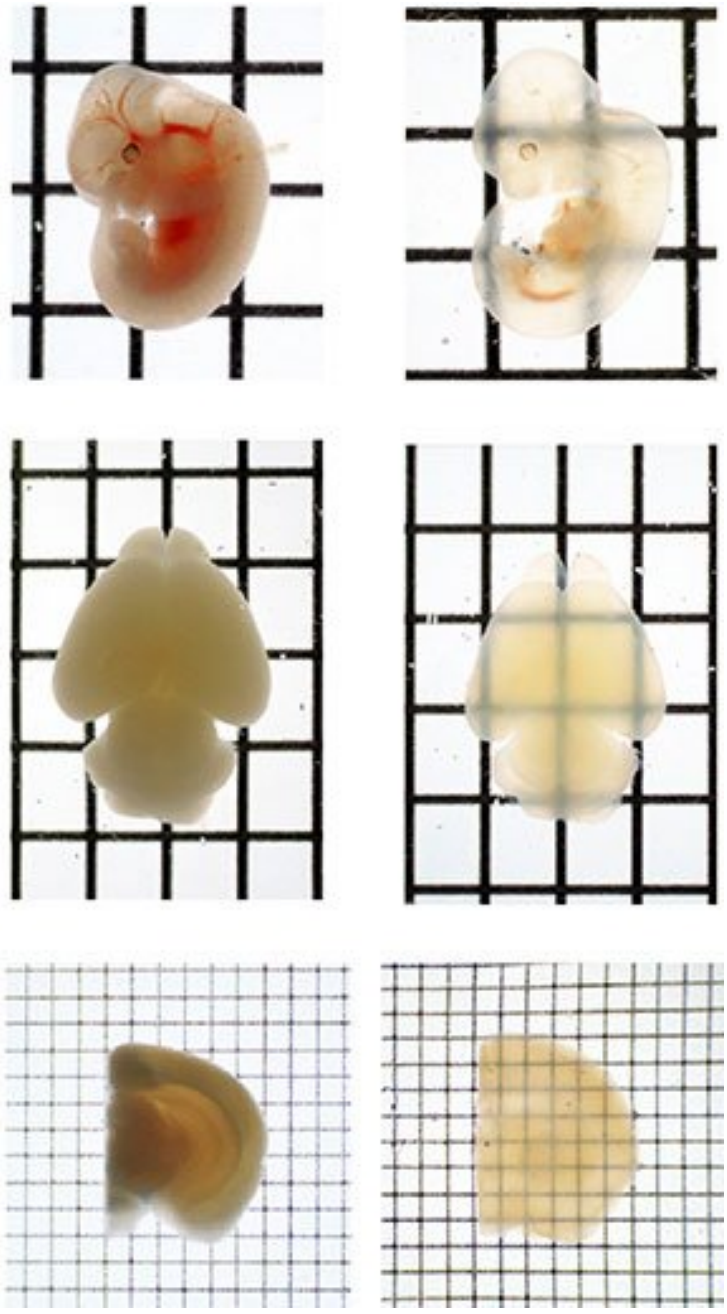
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Japan study: Sugar solution makes tissue transparent

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Singapore: Researchers from Japan's RIKEN Center for Developmental biology have developed a new sugar and water-based solution that turns tissues transparent in just three days, without disrupting the shape and chemical nature of the samples. The research has been published in Nature Neuroscience.

Several scientists in the US and Japan have reported a number of techniques to make biological samples transparent over the past few years. "However, these clearing techniques have limitations because they induce chemical and morphological damage to the sample and require time-consuming procedures," explains Dr Takeshi Imai, who led the study.

SeeDB, an aqueous fructose solution that Dr Imai developed with colleagues Dr Meng-Tsen Ke and Dr Satoshi Fujimoto, made mouse embryos and brains transparent in just three days, without damaging the fine structures of the samples, or the fluorescent dyes they had injected in them. They could then visualize the neuronal circuitry inside a mouse brain, at the whole-brain scale, under a customized fluorescence microscope without making mechanical sections through the brain.

The solution helped the team to describe the detailed wiring patterns of commissural fibers connecting the right and left hemispheres of the cerebral cortex, in three dimensions, for the first time. Dr Imai and colleagues also reported that they were also able to visualize in three dimensions the wiring of mitral cells in the olfactory bulb, which is involved the detection of smells, at single-fiber resolution.

The authors revealed that, "Because SeeDB is inexpensive, quick, easy and safe to use, and requires no special equipment, it will prove useful for a broad range of studies, including the study of neuronal circuits in human samples."