

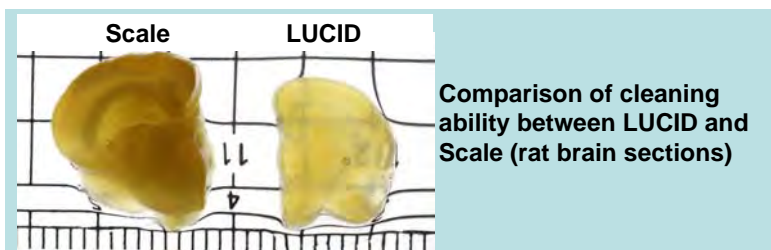
1. Abstract

- For 3D-imaging of tissue structure, a simple and versatile method that turns organs transparent benefits every biological research field.
- We present a new tissue clearing technique, **LUCID** (i**L**Uminate **C**leared organs to **I**Dentify target molecules), which does not need a delipidation process or a special device.
- **LUCID** is a safe, simple, and versatile tool for 3D-visualization of target molecules in every research field including cancer, bone diseases, joint diseases, leukemia, hematopoiesis, and drug discovery.

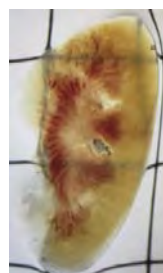
2. Procedure

1. Organs are simply immersed in **Solution-1** (thiodiethanol+sucrose) for 0.5 to 1 day followed by **Solution-2** (thiodiethanol + glycerol + non-ionic organic iodine compound) for 1 to 5 days.
- (2) LUCID-cleared samples are observed with a multiphoton microscope.
- (3) Cleared samples can be further examined with routine histochemical analyses.

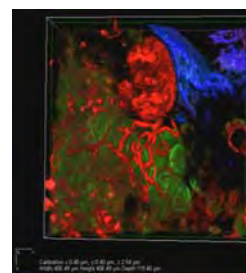
3. LUCID-cleared organs (macroscopic and multiphoton microscopic images)



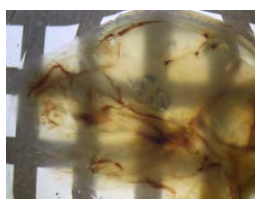
Comparison of cleaning ability between LUCID and Scale (rat brain sections)



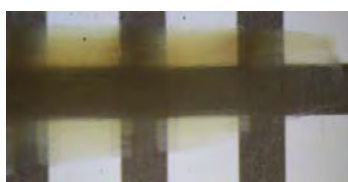
Adult rat kidney



Renal cortex multiphoton microscopy rendered image
red=blood vessel,
green=renal tubule
blue=SHG (collagen fiber)



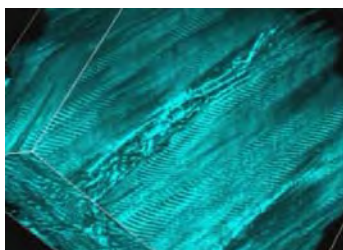
3 day-old rat pup head



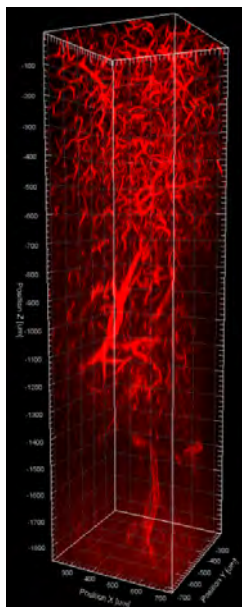
Adult rat muscle



Adult EGFP transgenic rat hindlimb (knee joint). Femur and tibia bones become transparent and bone marrow (red color because of hemoglobin) is clearly visualized.

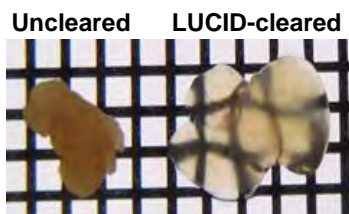


Adult rat muscle multiphoton microscopy
Sarcomere stripes in muscles are visible.

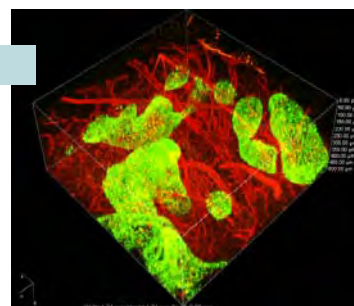


Adult rat brain (hippocampus) blood vessels

Inoculated lung tumor



Tumor cells expressing EGFP (green) and blood vessels (DyLight594-bound Lycopersicon esculentum lectin, red) are visualized. Tumor structures are visualized to the limit of the working distance of our objective lens.



Patent Licensing Available

Patent No. : WO2014/115206

JST/ IP Management & Licensing Group : phone: +81-3-5214-8486, e-mail: license@jst.go.jp