Tissue Optical Clearing Reagent

Whole-brain/ body imaging with single-cell resolution

CUBIC

Data provided by Dr. Etsuo A Susaki, and Dr. Hiroki R. Ueda, RIKEN
Dr. Hiroki R. Ueda et al. developed a simple, efficient, and scalable brain/body clearing method and imaging/computational analysis pipeline, CUBIC (clear, unobstructed brain/body imaging cocktails and computational analysis). CUBIC offers a fluorescent-preserving, high-performance and device-free tissue clearing method based on hydrophilic Solutions (ScaleCUBIC Solutions).

It enables reproducible whole-organ and whole-body clearing and rapid 3D imaging with LSFM. CUBIC also provides processing and analysis of 3D images for extracting biological information.

Therefore, CUBIC presents a platform of whole-organ/body imaging with single-cell resolution and image informatics, which enables a wide range of users to perform experiments targeting cellular and organ layers with multiple samples.

**Benefits of CUBIC**

- **Easy-to-use**
- **No special equipment required**
- **Follow up 2D H&E**
- **High transparency**
- **Applicable for many organs**
- **Compatible with IF, FP and other fluorescent labels**

**CUBIC Applications**

**Typically, a 7:3 mixture of Mounting Solution 1 and 2 (RI ~1.49) can be used.**

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**Figure 1.** Transmittance images of mouse whole organs before and after clearing with ScaleCUBIC Solutions.

**Figure 2.** Transmittance images of mouse 2 mm slices before and after clearing with ScaleCUBIC Solutions.
CUBIC Application for fluorescent protein expression

<table>
<thead>
<tr>
<th>Fixation</th>
<th>Wash</th>
<th>Preprocessing</th>
<th>Delipidation</th>
<th>Wash</th>
<th>Fluorescent labels</th>
<th>Wash</th>
<th>Permeabilization</th>
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<tbody>
<tr>
<td>Perfusion fixation + post fixation</td>
<td>PBS</td>
<td>50% Scale CUBIC-1 Solution</td>
<td>Scale CUBIC-1 Solution</td>
<td>PBS</td>
<td>PI (5 μg/mL)</td>
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<td>50% Scale CUBIC-2 Solution</td>
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<td>RT</td>
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<td>1 day</td>
<td>1 day</td>
<td>2 days</td>
<td>6 - 8 days*</td>
<td>1 day</td>
<td>2 days</td>
<td>&gt; 1 day</td>
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<td>Imaging</td>
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<tr>
<td>Scale CUBIC-2 Solution</td>
<td>Mounting&quot;**</td>
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Figure 3. LSFM imaging of CAG-EGFP Tg Mouse (8 w Male) whole brain, whole heart and dissected liver.

Clearing and Imaging:
- Scale CUBIC-2 Solution:
  - RT - 37 °C:
    - 1 day
  - RT:
    - 1 day

An enlarged view of brain:
- EGFP
- PI

An enlarged view of heart:
- EGFP
- PI

An enlarged view of liver:
- EGFP
- PI
CUBIC Application with pathological methods

Human lung

Human Lymph node

**Figure 4.** Tissue clearing of various human organs with CUBIC

**Figure 5.** Tissue clearing and 3D imaging of pathological specimens with CUBIC.

**References**


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Listed products are intended for laboratory research use only, and not to be used for drug, food or human use.

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