

### Molecular Surgery of DNA with Enzyme-Immobilized Particle

Focused Laser

Microparticle

DNA-cutting Enzyme

Anchoring

Stretch-and-positioned DNA

Solid Surface

1  $\mu\text{m}$

DNA

3 kb = 1  $\mu\text{m}$

The molecular structure of the cutting end is arly defined by the nature of the enzyme.

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### Sequence detection on a chromosomal DNA with the use of RecA-immobilized particle driven by optical tweezers

When the target sequences is there

Micro particle

RecA

ss-DNA

Optical tweezers

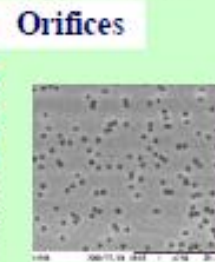
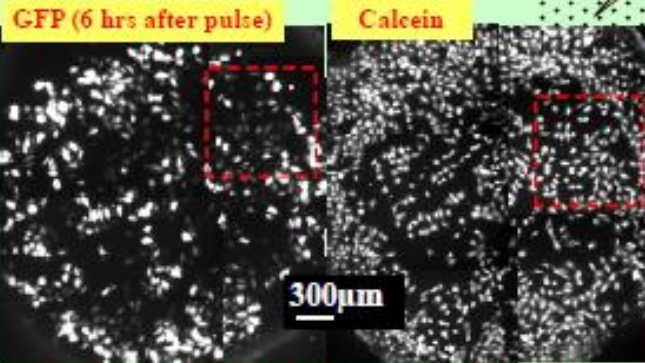
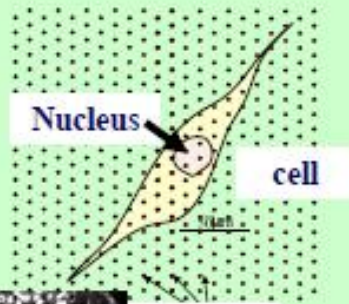
3 倍速

5  $\mu\text{m}$

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## Introduction of Plasmids

**Electrophoresis-governed**  
Orifice 2mm, Porosity 6%  
→ at least one orifice beneath nucleus  
**Expression starts in 2 hrs.**



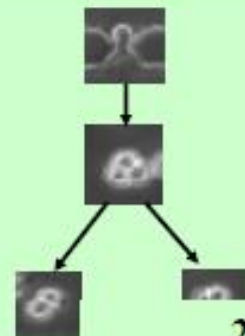
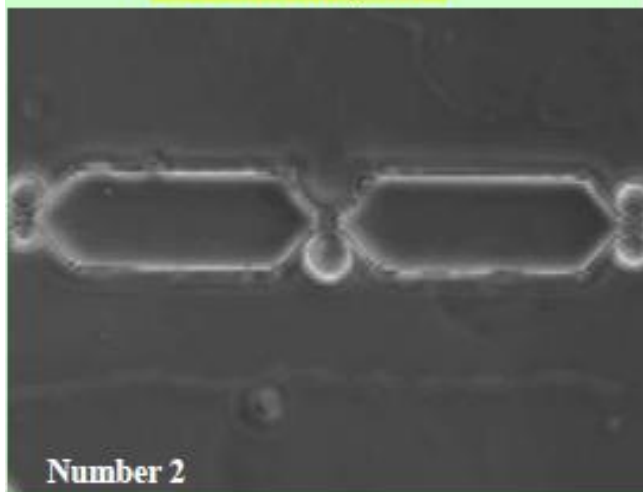
(GFP-expressing cells:80~90)/ (Survived cell:100)

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## Time lapse imaging of L929-L929 fusants with micro-orifice large diameter ( $> 5 \mu\text{m}$ )

Imaging the cells after fusion for 4 days

**Division into three**



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