

# Micro Manipulation System | MMS

Cells and biomolecules can be freely handled with an optical hand.

- Utilize laser beam to freely trap or remove cells, biomolecules, and etc. with non-contact method.
- 1064nm near-infrared laser trapping minimizes the damage on cells and biomolecules.
- A particle of 1 $\mu$ m can also be trapped.
- Two-beam optical system enables multiple operations such as stretching the micro-object or pressing them each other. Two beams can also be individually controlled.
- Vibration Isolation Table(option) provides you high stability in operation.

## Application Systems

## Optics & Optical Coatings

## Opto-Mechanics

## Bases

## Manual Stages

## Actuators & Adjusters

## Motorized Stages

## Light Sources & Laser Safety

## Index

## Microscope Unit

## Alignment

## Interferometers

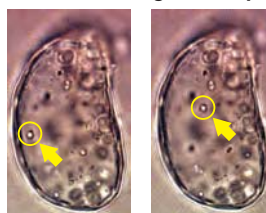
## Inspection/Observation

## Bio-photonics

## Laser Processing



■ Granule in a living cell is optically trapped.



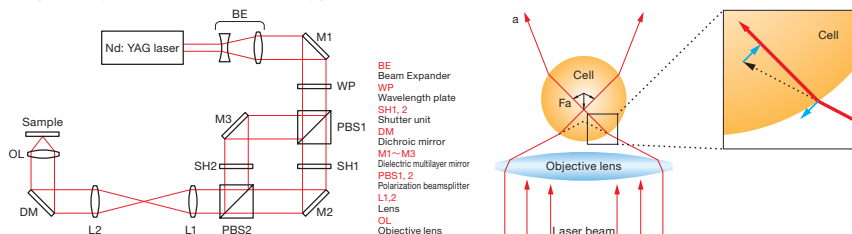
■ Altering orientation of a cell with 2 beams



## Laser Optical tweezers

It is a means of wrapping cells or particles or etc., using radiation pressure of light occurred in laser irradiation to an object, like seizing an object with a pair of tweezers, which was first thought up by Arthur Ashkin in 1970s. Recent applications of its feature, the feasibility in trapping particles of  $\mu$ m order, to engineering science, medical science, biology, etc., have been reported and it made the development of this device be watched with keen interest. Sigma Koki's Micro Manipulation System has realized introduction of laser in optical unit by application of Optics and Opto-mechanics produced by SIGMA KOKI which enabled space-saving and high efficiency.

### ◎ Optical System for 1laser 2beam type



### 1laser 2beam type / Trapping Laser 5W

Part Number	Equipment Configuration
MMS-1064-5000-1L/2M/2S	Manual 2axis / Shutter
MMS-1064-5000-1L/1M1E/2S	Motorized 2axis / Shutter
MMS-1064-5000-1L/2E/2S	Manual 1axis & Motorized 1axis / Shutter

### 1laser 1beam type / Trapping Laser 5W

Part Number	Equipment Configuration
MMS-1064-5000/1M	Manual
MMS-1064-5000/1M/1S	Manual / Shutter
MMS-1064-5000/1E/1S	Motorized / Shutter

\*1 Above lists do not include prices for microscope and vibration isolation table.

\*2 Please inform us of the maker and part number(model) of your existing microscope before purchase.

\*3 Some models of microscopes may not be supported. Please contact the sales department.

### Use in combination with Epi-Fluorescence microscopy

Introduction of trapping laser into microscopes allows continued usages of existing Camera Port or Fluorescent Lamp Port. This enables laser trapping while doing Total Internal Reflection Fluorescence Microscopy or Epi-illumination Microscopy.

For customized Dichroic mirrors for different trapping laser or observation wavelength, please contact our International Sales Division.

\* All sorts of operating methods and optical systems can be selected to suit sample and research purpose.

Supplementary attachment of a piezo actuator, etc is available to operate beams, in addition to manual or motorized control.

\* Use in combination with Motorized XY stage for microscope (optional) makes various operations possible.