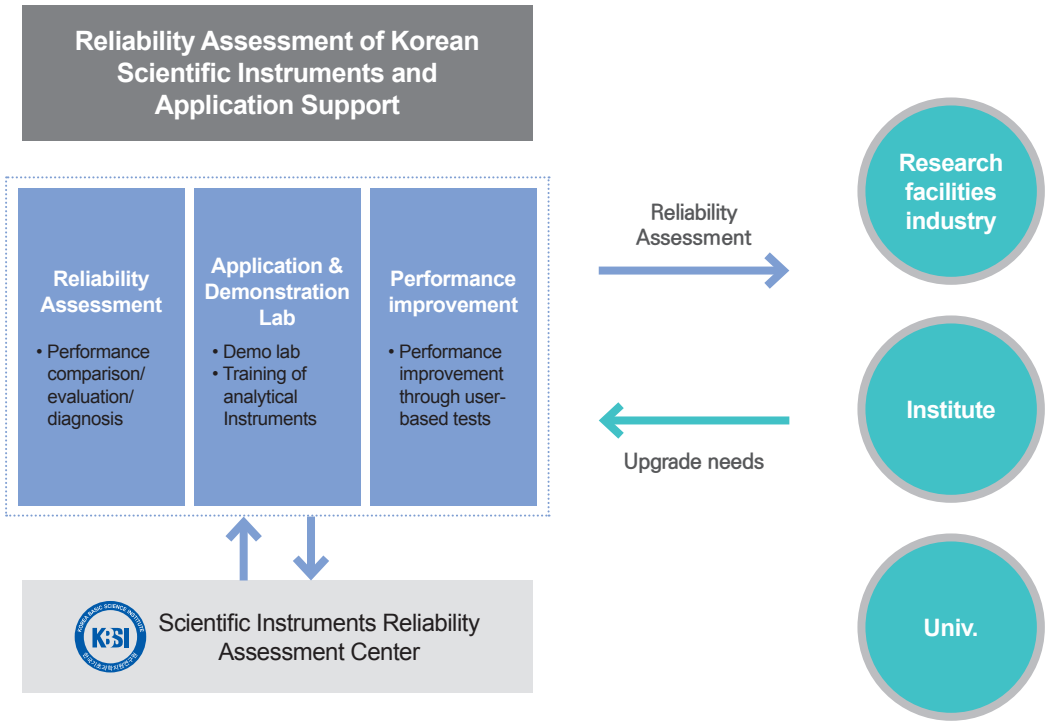
www.kbsi.re.kr

Scientific Instruments Reliability Assessment Center

KBSI KOREA BASIC SCIENCE INSTITUTE

Scientific Instruments Reliability Assessment Center

- Contributing to the promotion and support of domestic research equipment industry with the increased credibility of facilities through comparison/evaluation/diagnosis/improvement of domestic equipment by preparing the standard for the evaluation of domestic equipment performance and establishing/operating the domestic equipment application lab.
- Supporting quality enhancement through the verification of superiority of research equipment and performance improvement through user-based tests on domestic analytic equipment.

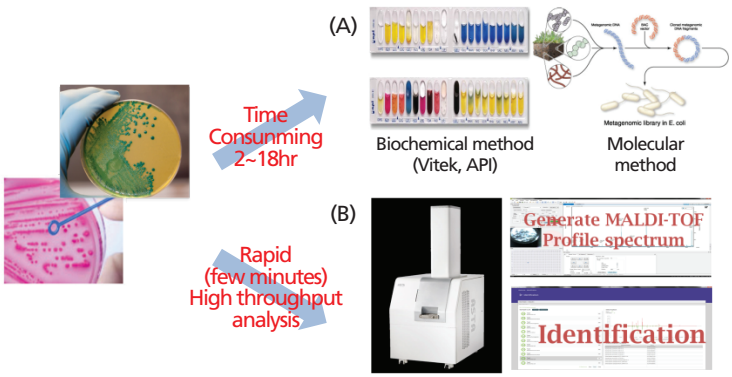


ASTA is a technology-based company that develops and manufactures analytical instruments, equipment for sample preparations, and supplies. In particular, ASTA focuses on the development of Matrix Assisted Laser Desorption Ionization Time-of-Flight Mass Spectrometer, its applications and supplies including MALDI-plates, matrix spotter and microwave based sample digestion system.

Commodity	**Tinkerbell LT** (MALDI-TOF MS)
Release Date	September, 2015
Features & Specifications	Tinkerbell LT MALDI-TOF MS system analyzes the mass values of organic molecules with large molecular weights by measuring the time-of-flight of the ions, which are generated by laser ionization with the help of matrix substances, to reach the detector. The ions are accelerated to the detector by the electrical field. • System is optimized for diagnosis applications • Compact system in consideration of space-efficiency and movement convenience. Easy maintenance and upgrades • Maximized user-friendliness. Increased quantification, reproducibility, and sensitivity • Highly economical system: Aluminum chamber and vacuum components for enhanced machinability
Certification or Awards	FDA 1st grade medical device declared: 2013.12 CE-IVD Acquired: 2015.12

KBSI Performance enhancements

1. Prevention of teaching issue before MALDI-TOF MS drive
2. Improved calibration error of MALDI-TOF MS
3. Improved MALDI-TOF MS Resolution
4. Added Spectrum Quality Guide (SQG) function
5. MicroID SW and Database Upgrade



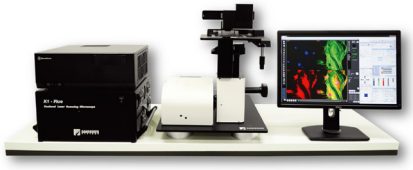
Microorganism identification using MALDI-TOF

Young Hwan Kim, Ph.D
Biomedical Omics Research Group, Korea Basic Science Institute (KBSI)

- 2015 Autumn Korea Chemical Society presentation (Daegu Exco, 10.15) “Performance Evaluation of Domestic MALDI-TOF MS on Microorganism Identification”
- 2016 Autumn Korea Chemical Society presentation (Busan BEXCO, 10.14) “Lipid mass fingerprinting of microorganisms by matrix-assisted laser desorption /ionization mass spectrometry”

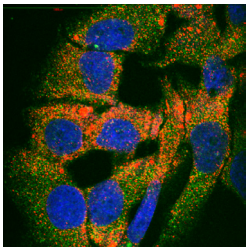
NANOSCOPE SYSTEMS

Nanoscope Systems, Inc. is a developer and manufacturer of a confocal laser scanning microscope. Established in 2006, we have successfully built up the world class confocal microscope for industrial applications and academic researches for the first time in Korea. We have recently developed a fluorescence confocal microscope for bio-chemical applications, and it becomes another good option to the reserachers.



Fluorescence laser confocal microscope, K1-Fluo

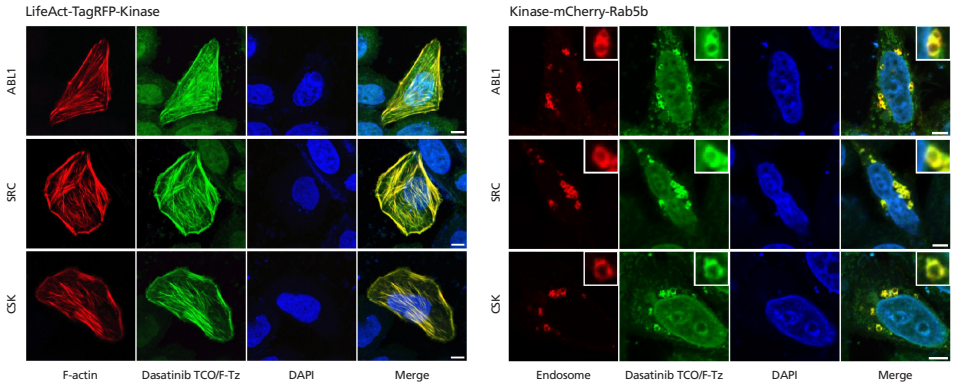
Commodity	**K1-Fluo** (Fluorescence confocal laser scanning microscope)
Release Date	January, 2013
Features & Specifications	With the configuration of fully motorized and compact sized digital confocal microscopy as well as a lower price, it is appropriate for the individual laboratory use, which can be a substitution of an overspecified confocal microscope or a conventional non-confocal fluorescene microscope. K1-Fluo would be a good candidate for the researchers who need laser confocal systems, but considering conventional non-laser fluorescence microscope.
Certification or Awards	CE certification



Cell image by K1-Fluo

KBSI Performance enhancements

The biological experts in KBSI pointed out the difference from the other normally expected funcions of the confocal microscope, which was not considered at all by the system engineeres. The performance, configuration, and operation maner has been updated and optimized for the biological application according to the feedback advice by the experting researcher. It could be done within a relatively short period, because it was not a difficult technical issue, but the understanding of the application field.



Kyung-Bok Lee , Ph.D
Division of Bioconvergence Analysis, Korea Basic Science Institute(KBSI)

- The images taken by confocal microscope K1-Fluo is publicated in the SCI journal paper; A bioorthpgonal approach for imaging the binding between Dasatinib and its target proteins inside living cells, Chem. Commun. 2016, 52, 11764-11767
- Autumn Conference of the Korean Society of Applied Pharmacology (2016.10.7, Seoul)
- International Conference of the Pharmaceutical society of Korea, (2016.10.19~20, Seoul)

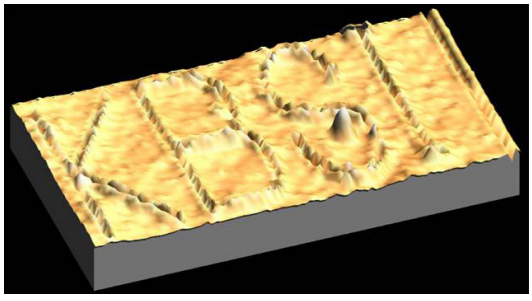
NanoFocus

NanoFocus Inc. has excellent know-how and technologies in the field of nanoscale science and technology, especially Scanning Probe Microscopy.
NanoFocus Inc. provides products and solutions for investigation of nanoscale world. Our main focus is on the development of more advanced scanning probe technology to give our customer the best instrument.

Commodity	**n-Tracer** (AFM)
Release Date	2006
Features & Specifications	• Nano-scale metrology analysis of sample surface • Fully automatic DFM tuning & setting • Constant current feedback lithography • Adaptive scan mode for controlling scan speed • Supported mode: contact AFM, non-contact AFM(DFM), LFM, Phase image, MFM, F-D spectroscopy, • Nano-lithography, Current/conductive AFM, I-Vspectroscopy.
Certification or Awards	

KBSI Performance enhancements

1. Improvement of AFM H/W
   - Improvement of Scanner , Upgrade Controller
2. Improvement of User interface
   - S/W upgrade (Expscan-> Surfworks)
   - Improbe User interface
     : Animation tuoring ,
     : Add lithograpgy menu and measuring function on system setting
     : Improve lithography interface
     : Analysis surface information by F-D curve
     → Improve AFM resolution



Kim, Jung-Hwan, Ph.D
Mass Spectrometry & Advanced Instrumentation Group, Korea Basic Science Institute (KBSI)

117th General Meeting of the KCS (PHYS.O-6 Oral Presentation) (October 12~14, 2016 BEXCO, Busan, Korea)
• " Improvement of AFM lithography system and studying characteristics of nano-indentation AFM lithography"

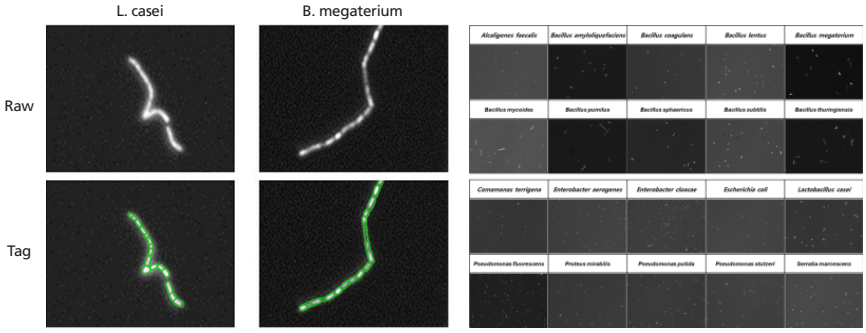
logos biosystems

Logos Biosystems is dedicated to the development and commercialization of innovative technologies to support the life science research community. Since its founding in 2008, Logos Biosystems has been developing a series of automated systems and imaging instruments for laboratories engaging in research with a cellular and molecular emphasis.

Commodity	**QUANTOM Tx™**
Release Date	November, 2016
Features & Specifications	The QUANTOM Tx™ Microbial Cell Counter is an image-based, automated cell counter that can identify and count individual bacterial cells in mere minutes. The QUANTOM™ cell counting algorithm is the first of its kind, capable of detecting individual bacterial cells regardless of their diversance. 1. Rapid: Minutes to results and no culturing required 2. Accurate: No estimating based on colony forming units or turbidty 3. Single bacterium detection: Regardless of cell shape, size, or arrangement 4. Declustering bacteria: Counting individual bacilli in each chain 5. Customizable counting parameters: Adjusting counting parameters to detect and count 6. Data report generation: Exporting count results via Wi-Fi or USB
Certification or Awards	CE, FCC and KC

KBSI Performance enhancements

1. Successful development and lauch of the first domestic bacterial cell counter QUANTOM Tx (2016. 11. 1)
2. Database acquired by 20 different types of bacteria counting tests depending on their morphologies (size and shape) and arrangemnts (singe or clusters).
3. Enhancment of cell detection and declustering algorithm that can accurately count individual bacterial cells in even the tightest clusters.
4. Update of sophisticated bacterial cell counting software
5. Performance evaluation with competitive foreign bacterial counter (with Accuri, BD)



Lactobacillus casei and Bacillus megaterium are rod-liked, Gram-positive bacteria that often occur in chains. The QUANTOM Tx™ is able to count individual bacilli in each chain.

Jeong Ah Kim, Ph.D
Biomedical Omics Research Group, Korea Basic Science Institute(KBSI)

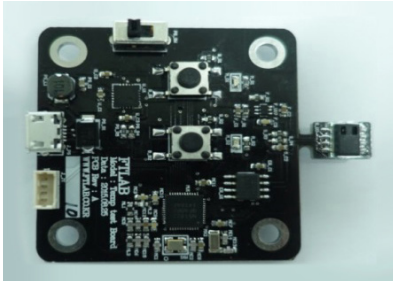
- Listed on KOSDAQ, Logos Biosystems, Inc (2016. 11. 05)
- Patent issued, “Methods for detecting, identifying or counting microorganism and using therof” (2016. 12. 01)
- Autumn Conference of the Korean Society of Applied Pharmacology (2016.10.7, Seoul)
- International Conference of the Pharmaceutical society of Korea, (2016.10.19~20, Seoul)

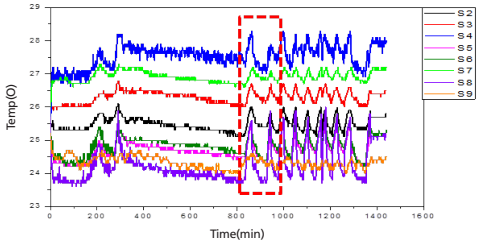
FTLab has been started a research and development company based on electronic physics.Since its establishment in 2001, we have been developing various R&D equipment more than 100 kinds that require high-precision measurement technology such as Display research and Plasma generation and Diagnostics equipment.
Recently, we are developing various smart sensor technologies to measure invisible hazard such as radioactivity, electromagnetic waves, Radon and so on.
As a result, we developed various smart checkers that can easily measure real-time using smart phone, and launched SMART FTLAB in 2014. The cumulative sales volume of these smart checkers reached 50,000 in online malls such as Amazon, eBay.

Commodity	**BLE Meter & Data Logger**
Release Date	August, 2015
Features & Specifications	Wireless Bluetooth LE communication (10 meters) • Data Logger : 4 Mbyte • Ultra low power •Accurate measurement of the current/voltage • Smart measurement system of developers to check data and graphs on smart devices • For convenience of engineers, students, teachers & whoever requires the measurement. • Simultaneous operation possible with 8 bluetooth LE meters • Maximum 3 months data logging by ultra low power design • Android Application realization of Bluetooth communication
Certification or Awards	KC (Korea Certification)

KBSI Performance enhancements

- Performance test through various tests such as high voltage, low voltage, PC utilization, long time / real time measurement
- The durability and function implementation problems discovered through the test results were complemented before launch and reflected in the product.
- Simultaneous storage of laboratory environment such as temperature and humidity and prototyping
- Performance enhancement factors for high performance and durability that could not be applied to the initial models developed will be applied to new models in 2017





Choi, Myoung Choul, Ph.D
Mass Spectrometry & Advanced Instrumentation Group, Korea Basic Science Institute (KBSI)

2015 Autumn Korean Physical Society presentation (Gyeongju Convention, 10.22)

Application & Demonstration Lab for Scientific Instruments

Daedeok Headquarters

169-148, Gwahak-ro, Yuseong-gu, Daejeon, Korea [34133]
Tel. +82-42-865-3471 Fax. +82-43-240-5159
E-mail. kminsun@kbsi.re.kr

Jeonju Center

Life Science Hall, Chonbuk National University Hospital,
20 Geonji-ro, Deokjin-gu, Jeonju, Jeollabuk-do, Korea [54907]
Tel. +82-63-270-4306 Fax. +82-63-270-4308

MALDI-TOF
Mass Spectrometer

TINKERBELL RT

SEM
(Scanning Electron
Microscope)

EM-30

GC
(Gas Chromatography)

YL6500GC

HPLC
(High Performance Liquid
Chromatography)

YL9100

Real-Time qPCR

Exicycler™ 96

UV-VIS Bio
Spectrophotometer

Nano-MD

Rapid Enzyme
Digestion System

HST REDS