



Office of the Principal Scientific Adviser  
to the Government of India  
SCIENCE & TECHNOLOGY CLUSTER



**BCKIC**  
Bhubaneswar City  
Knowledge Innovation  
Cluster Foundation



**Thermo Fisher**  
SCIENTIFIC



# **Thermo Fisher Scientific Centre of Excellence**

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**KIIT-Technology Business Incubator  
Technical Infrastructure Brochure**

## Thermo Fisher Scientific Centre of Excellence: A Hub for Molecular Diagnostics

In partnership with Thermo Fisher Scientific, KIIT - TBI has established a state-of-the-art molecular diagnostics center in conjunction with BCKIC, an initiative of the O/o PSA to Gol, serving as the knowledge partner. In addition to supporting researchers in expanding their knowledge and achieving their entrepreneurial objectives, this facility will serve as a center for innovation, fostering progress within the molecular diagnostic industry in the eastern and northeastern regions.

By bridging the gap between academic research and industrial application, the CoE provides startups and researchers with access to state-of-the-art validation infrastructure.

This facility is equipped to support the entire diagnostic value chain—from high-throughput cell analysis and precise genomic amplification to protein quantification and secure sample preservation.

### Instrumentation and Scope : Advanced Cell Analysis

#### Attune™ NxT Flow Cytometer

##### The New Standard in Flow Cytometry

The Attune™ NxT Flow Cytometer utilizes revolutionary acoustic focusing technology to align cells prior to interrogation. Unlike traditional hydrodynamic focusing, this allows for high sample throughput rates without compromising data quality, making it ideal for rare event detection and dilute samples.



Feature	Specification
Focusing Technology	Acoustic Focusing (Ultrasonic alignment)
Throughput	Up to 35,000 events/second
Flow Rate	12.5 $\mu$ L/min to 1,000 $\mu$ L/min (10x faster than traditional)
Optics	Up to 4 Lasers/14 Fluorescence Channels
Laser Profile	Flat-top beam profile for consistent excitation
Sensitivity	FITC $\leq$ 30 MESF, PE $\leq$ 10 MESF
Applications	Rare event detection, cell cycle analysis, immunophenotyping



### Precision Genomics & PCR

#### ProFlex™ PCR System

##### Ultimate Thermal Control

The ProFlex™ PCR System redefines thermal cycling with VeriFlex™ Blocks. This technology employs independent Peltier blocks to create precise temperature zones, allowing for linear optimization of annealing temperatures and the simultaneous running of three independent experiments.<sup>7</sup>

Feature	Specification
Ramp Rate	6.0°C/sec (Block)
Thermal Accuracy	$\pm$ 0.25°C (35°C–99.9°C)
Thermal Uniformity	<0.5°C (20 sec after reaching 95°C)
Block Configuration	Interchangeable (e.g., 3 x 32-well, 96-well)
Connectivity	Wi-Fi enabled for remote monitoring

## Biosafety & Cell Culture

### Herasafe™ 2030i Biological Safety Cabinet

#### Smart Protection for Sensitive Samples

A Class II, Type A2 cabinet featuring SmartFlow™ Plus technology, which automatically compensates for filter loading to maintain constant airflow. The DAVe Plus system monitors airflow in real-time, providing immediate alarms for any obstruction.

- Filter Type: H14 HEPA (99.995% efficiency)
- Interface: 7-inch touchscreen with "Health Traffic Light" status.
- Disinfection: Cross-beam UV irradiation for shadow-free decontamination.
- Ergonomics: Motorized sash with SmartClean Plus access.



#### BB15 CO2 Incubator

##### Reliable Growth Conditions

Designed for the stable culture of eukaryotic cells, the BB15 (150L) features a solid copper interior for natural, 24/7 contamination control without chemicals.

- Capacity: 150 Liters (5.3 cu. ft.)
- Temp. Range: Ambient +3°C to 55°C
- CO2 Control: 0–20% via TC Sensor
- Humidity:>95% at 37°C (Water reservoir)

## Quantitative Analysis

### Multiskan™ GO Spectrophotometer

#### Versatile UV-Vis Analysis

A monochromator-based microplate and cuvette spectrophotometer that allows for free wavelength selection (200–1000 nm) without filters.



Feature	Specification
Wavelength Range	200–1000 nm (1 nm steps)
Formats	96/384-well plates & Cuvettes
Read Speed	<10 seconds per 384-well plate
Pathlength Correction	Automatic normalization to 1 cm



#### Qubit™ 4 Fluorometer

##### Target-Specific Quantification

Uses fluorescence-based detection to specifically quantify DNA, RNA, and protein. Highly sensitive and accurate even in the presence of contaminants that affect UV absorbance.<sup>17</sup>

- Sample Volume: 1–20 µL
- Processing Time:<3 seconds per sample
- Features: RNA IQ Assay for integrity checking; Reagent calculator

## Sample Processing & Automation

### SL 8 Small Benchtop Centrifuge

Compact yet powerful, featuring Auto-Lock™ Rotor Exchange for 3-second rotor changes and ClickSeal™ biocontainment lids.<sup>20</sup>

- **Max Speed:** Up to 16,000 rpm (Fixed Angle)
- **Capacity:** Up to 4 x 145 mL (Swinging Bucket)



### Wellwash™ Microplate Washer

Automates the washing of 96-well plates for ELISAs, ensuring low residual volumes (<2 µL/well) and high reproducibility.<sup>21</sup>

**Features:** Unpressurized bottles for safety; Linear shaking; Large color display.

### Precision™ Water Bath

General-purpose water bath providing temperature uniformity of  $\pm 0.2^{\circ}\text{C}$  at  $37^{\circ}\text{C}$ , essential for thawing reagents and warming media.



### High-Performance Lab -20°C Refrigerator

Ensures critical sample stability with advanced compressor systems designed for laboratory-grade temperature uniformity, unlike standard consumer freezers.<sup>1</sup>



## Critical Utilities

### Barnstead™ Ultrapure Water System

- Delivers Type 1 ultrapure water (18.2 MΩ·cm resistivity) required for sensitive molecular biology applications.<sup>24</sup>
- **TOC:** <5 ppb (UV oxidation models)<sup>24</sup>
- **Filtration:** 0.2 µm absolute filter for bacteria-free water<sup>24</sup>

## Our Service Portfolio

Leveraging state-of-the-art infrastructure, the CoE at KIIT-TBI offers a suite of specialized services to support your research, validation, and diagnostic development needs.

### 1. Advanced Cytometry & Cell Analysis

- Utilizing the Attune™ NxT Flow Cytometer with acoustic focusing technology, we provide high-precision cellular insights:
- **Rare Event Detection:** Identification of low-frequency cell populations in dilute samples.
- **Immunophenotyping:** Multi-parametric analysis of cell surface and intracellular markers.
- **Cell Cycle & Apoptosis Analysis:** Detailed profiling of cell health and proliferation.

## 2. Precision Genomics & Molecular Diagnostics

Our molecular biology suite, featuring the ProFlex™ PCR System and Qubit 4 Fluorometer, supports high-throughput genomic workflows:

1. PCR Optimization: Rapid thermal cycling optimization using VeriFlex™ Blocks for simultaneous independent experiments.
2. Target-Specific Quantitation: High-sensitivity quantification of DNA, RNA, and proteins, even in the presence of contaminants.

Sample Integrity Validation: Specialized RNA IQ assays to check the quality and integrity of genomic samples.

## 3. Cell Culture & Bio-Assay Development

Our facility provides a sterile, controlled environment for eukaryotic cell studies using Herasafe™ 2030i and BB15 systems:

Stable Cell Line Maintenance: Long-term culture and expansion of eukaryotic cells under monitored CO2 and humidity conditions.

Cytotoxicity & Proliferation Assays: Testing the impact of compounds on cell growth and viability.

UV-Vis Spectrophotometry: Kinetic and endpoint assays (200-1000 nm) for protein and nucleic acid analysis.

## 4. Automated Immunoassay Support

Streamline your ELISA and protein workflows with our automation tools:

Automated Plate Washing: High-reproducibility washing for 96-well ELISA plates to ensure low residual volumes.

High-Speed Sample Processing: Efficient sample preparation using microplate washers and high-performance benchtop centrifuges.

## 5. Technical Infrastructure & Utility Support

We ensure your research is backed by laboratory-grade critical utilities:

Ultrapure Water Supply: Provision of Type 1 (18.2 MΩ-cm) water for sensitive molecular biology applications.

Secured Sample Preservation: Laboratory-grade -20°C storage for critical reagent and sample stability.

Application Focus: Industry Solutions

Oncology & Precision Medicine

The CoE supports cancer research through biomarker discovery and liquid biopsy validation.

- Services: Detecting circulating tumor cells (CTCs), analyzing somatic mutations (e.g., EGFR, KRAS), and profiling tumor-infiltrating lymphocytes using flow cytometry.

## Infectious Disease Research

We facilitate the development of rapid diagnostic kits for viral and bacterial pathogens.

- Services: Viral load quantification, antimicrobial resistance (AMR) gene identification, and vaccine response monitoring through cytokine production analysis.

## Agritech & Food Safety

Advanced analytical tools are available for crop improvement and contaminant detection.

- Services: Quantifying plant pigments (chlorophyll/carotenoids), assessing nutrient levels (Vitamin C/phenolics), and PCR-based detection of Genetically Modified Organisms (GMOs).

Apart from the above, scientific utilization of the facility is done by providing Hands on training to students, researchers, startups by Industry experts.

**KIIT-TBI, KIIT-DU, Bhubaneswar, India**

Contact : 9937978398

Email : [ananyo.misra@kiitincubator.in](mailto:ananyo.misra@kiitincubator.in)



[kiitincubator.in/thermofisher-reg](http://kiitincubator.in/thermofisher-reg)