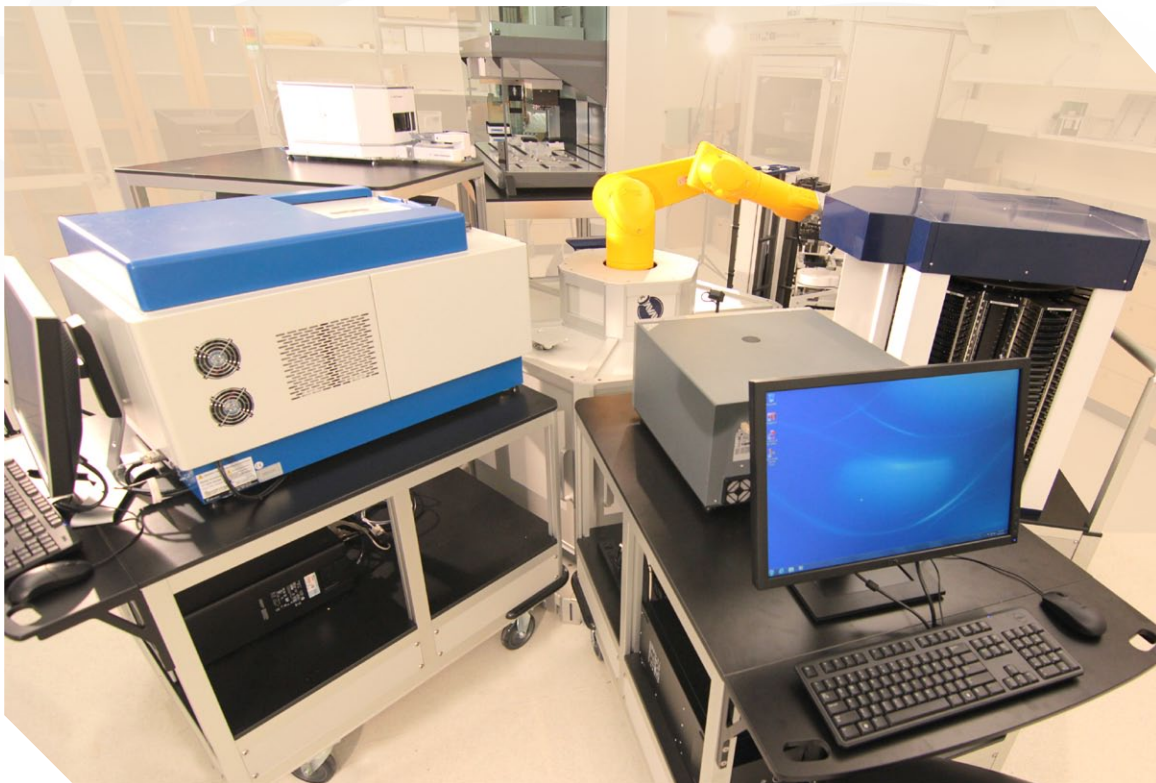


The David H. Koch Institute for  
Integrative Cancer Research

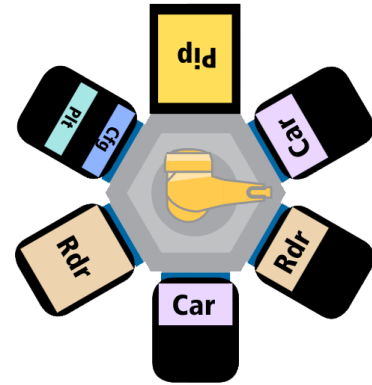
## **Flexible Robotic Systems Applied to Innovative Oncology Research**



## 6-Sided MicroStar

### Assay Screening Island

1 x <b>Rbt</b> Stäubli Robot	1 x <b>Rdr</b> Tecan Infinite M1000
2 x <b>Mcd</b> HighRes MicroDock	1 x <b>Rdr</b> Thermo ArrayScan VTI
1 x <b>Car</b> HighRes AmbiStore D	1 x <b>Pit</b> Biotek EL406 Washer
1 x <b>Car</b> HighRes NanoServe	1 x <b>Cfg</b> Agilent Centrifuge
1 x <b>Pip</b> Tecan Freedom Evo 150	



### Description

The second system is a HighRes 6-sided MicroStar. The MicroStar robotic system integrates a liquid handler, washer/dispenser and centrifuge for automated assay assembly, along with a multimode plate reader for general biochemical endpoints, and a high content imager to allow detailed cell-based analysis. As well as providing a mobile link to the BSL2+ NanoCell system via a docked AmbiStore cart, the implementation of HighRes' MicroDock technology also allows Koch Institute to run an automation platform with unparalleled flexibility - meeting the requirements of cutting-edge research by enabling the facile exchange of instrument technologies on and off the system.

### System Applications

The MicroStar system is configured to perform a variety of high throughput screening applications:

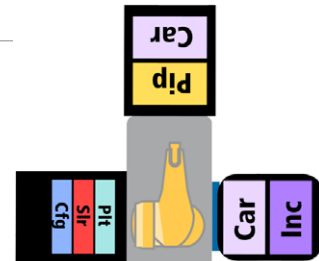
- Biochemical Assays – Running standard biochemical assays to increase throughput and reproducibility
- High Content Imaging Screens – Analysing complex cellular processes where subcellular localization is critical for determination of compound action”
- High Throughput ELISAs – Running protein production studies and normalizing genetic studies



# NanoCell

## Biosafety Level 2+ Automation

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| 1 x <b>Rbt</b> Stäubli Robot         | 1 x <b>Inc</b> Automated Incubator |
| 1 x <b>Mcd</b> HighRes MicroDock     | 1 x <b>Pit</b> Biotek EL406 Washer |
| 1 x <b>Car</b> HighRes AmbiStore D   | 1 x <b>Slr</b> KBiosystems Wasp    |
| 1 x <b>Car</b> HighRes MicroServe    | 1 x <b>Cfg</b> Agilent Centrifuge  |
| 1 x <b>Pip</b> Tecan Freedom Evo 150 |                                    |



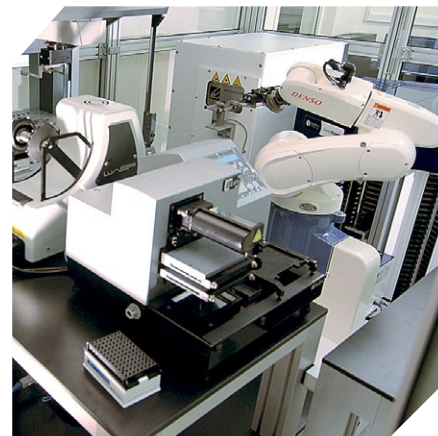
### Description

The first system is a HighRes NanoCell positioned in a compact, custom BSL2+ enclosure. The NanoCell robotic system integrates a liquid handler, washer/dispenser and a plate centrifuge to allow automated sample preparation and manipulation. Large quantities of labware can be stacked in the HighRes MicroServe, positioned directly under the liquid handler, providing a space-efficient means of enabling long, unattended runs. Samples that have completed their required processing in BSL2+ conditions can be placed by the robot into a docked HighRes AmbiStore carousel. The filled AmbiStore can be undocked from the system, wheeled out of the enclosure (through a set of double-doors), and docked into a separate, second HighRes system to allow follow-on assay processing on a larger, unenclosed robotic system.

### System Applications

The NanoCell system is configured to perform a variety of cell-based genomic applications:

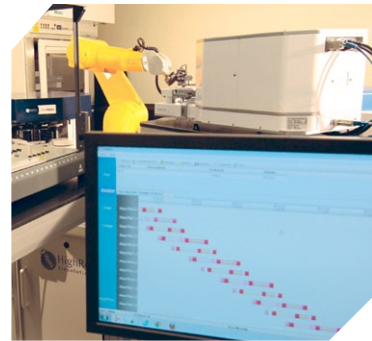
- Overexpression Screening - Screening of entire expression libraries with barcoded ORFeome libraries
- siRNA Screening – Discrete knockdown of target genes in multiple cell lines
- Lentiviral Screening – Generation, characterization and screening of live virus in BSL2+ conditions, safe to operators and the environment



## Koch Institute partners with HighRes Biosolutions to build state-of-the-art screening facility

July 12, 2011 – Boston, MA

The David H. Koch Institute for Integrative Cancer Research at MIT has selected HighRes Biosolutions to implement modular and flexible automation for its newly implemented screening facility. HighRes will provide The Koch Institute, which is revolutionizing the diagnosis, monitoring and treatment of cancer, with two screening systems that will be linked using HighRes' patented dockable cart-based automation platform. Investigators at the Koch Institute as well as other MIT affiliates will use the new systems for both genomic and biochemical approaches to fighting cancer with a particular interest in studying combination treatment synergies.



The first HighRes system will be dedicated to a cell culture-based genomic approach to oncology. The self-contained system will generate thousands of discrete lentiviral constructs targeting a multitude of genomic locations. Using RNAi technology, these specialized viruses enable researchers to selectively “knock down” the function of specific genes and proteins in cancer cells, resulting in the identification of pathways and individual disease contributing factors for various forms of cancer.

The second HighRes system will be used for more typical biochemical and compound screening strategies. This multifunctional, fully-automated system will be equipped for quantitative biochemical and protein assays, high-content imaging studies and compound screening for lead drug discovery. Besides integrating liquid handlers, plate washers/dispensers and various end point readers, the system will maintain proper sample handling throughout any process with the use of barcode readers.

These biochemical and genomic screening systems will be physically linked through mobile storage devices via HighRes' cart and dock-based automation platforms. The ability to dock and undock virtually any integrated device allows for quick and simple interaction between automation platforms and the rapid reconfiguration of systems to perform nearly any assay. This flexible and modular approach to automation also enables researchers at the Koch Institute to conduct all assay development on the same devices (either online or offline) that eventually will run their high-throughput screens.

“Bringing in advanced automation to support the experimental needs of our oncology research community represents an important milestone for us. These customized and yet highly flexible facilities paired with biologically-validated compounds and reagents will provide important new platforms to support the broad research interests of our MIT community,” explains Robert Urban, Executive Director of the Koch Institute at MIT.

“We are excited to have some of the best cancer researchers in the world working with our systems.” explains Chris Pacheco, Director of Life Science Technologies at HighRes Biosolutions. “I truly believe this group of biologists will be able to fully appreciate our flexible approach to laboratory automation and will take full advantage of its benefits in unforeseeable ways. We’re excited to see how our systems will adapt to their experimental designs.”