Automating Laboratory Processes with Agilent Automated Systems

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Outline

- Introduction of Agilent Automation Solutions (AAS)
  - Historical Review
  - Products Overview – Innovation Creates Business Opportunities
  - Characteristic of AAS
  - Agilent Automated Systems

- Case Study: Automating Laboratory Processes
  - Automating Compound Management in Drug Discovery
  - Automating Cell Maintenance and Cell-based Assay

- Conclusions
Historical Review

- Velocity 11 was Founded in 1999 headquartered in Menlo Park, CA
- Leader in automated liquid handling and lab robotics market
- Agilent Technologies acquired Velocity 11 as Agilent Automation Solutions in the end of 2007
- About 150 employees at time of acquisition
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Products Overview

Instruments:
- Bravo and VPrep: Liquid Handling
- BenchCel: Plate Handling
- VSpin, VCode, PlateLoc, VStack

Workstations:

BioCel® Systems:

Software:
- VWorks: Event Driven Automation Control

Consumables:
- Pipette Tips, Seal, Labels, etc.

Service:
- Service Contracts
- Preventive Maintenance
- Other Professional Services
Innovation Creates Business Opportunities

- Direct Drive Robot (DDR)
- One Touch Teaching
- Easy Docking

✓ Reliability
✓ High Operational Precision
✓ Safety
✓ Ease to Use
✓ Smaller Footprint
✓ Easy Recovery

Agilent Technologies
DDR Revolutionary and Innovative Technology: New Product Award (NPA)

Agilent’s Rob Nail (left) and Jon Wagner (center) are presented the ALA award by Jay Smith, Association of Lab Automation's Marketing Advisory Group Chairman
Customers and Applications

ADME/Tox
Cell Apoptosis
Cell based assay
Cell-based Flux assay
Cyp P450
DNA Isolation
HTS
ELISA-assay
Enzyme assay
Forensic DNA typing
gDNA extraction

Metabolic Stability
Nucleic Acid Sample Prep
PCR Clean up
PCR Set-up and cycling
Plasmid Purification
Plate Reformating
Receptor Translocation assay
RNA isolation
RNA sample prep
Sequencing Reaction Clean-up
Solubility
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What differentiates Agilent Automation Solutions?

- **Reliability**
  - ✓ Systems must run 24/7
  - ✓ Strong customer service
  - ✓ Software must have robust error handling capabilities

- **Flexibility/modularity**
  - ✓ Flexible integration with our or 3rd part instruments/devices
  - ✓ System must adapt to customer’s changing environment

- **Small Footprint**

- **Ease of use**
  - • Intuitive software including protocol set-ups
  - • Ability to integrate with existing data systems

- **Superior Customer Service**
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Agilent BioCel® Automation Systems

- **BioCel 1200/1800**
  - Modular
    - Connect multiple BioCels
    - Docking tables enable instrument ‘swap-ability’
  - Multiple footprint and system choices
  - Efficient architecture footprint optimization
  - Extensive 3rd party device integration
  - Extensive back-end software integration via VWorks

- **BioCel 900**
  - For applications of 100-250 plate capacities
    - including random access
  - Compact footprint saves valuable lab space
  - Open architecture enables easy reconfiguration
Flexibility: docking tables with Quick Dock

- Flexibility to change readers or other equipment, incubators
  - Available for offline use or maintenance

- Nothing bolted to the floor
  - Space saving, easy to move from one system to another or move the entire system to another lab

- Quick Dock
  - Pneumatic docking which with a single button push aligns the docking table
  - Also available in manual if table is not routinely moved
Integration with third party products

- **Incubators**
  - Fully integrated below deck, no additional lab space required
  - Temperature from 4°C to 50°C with variable CO₂ and humidity control.

- **Reagent dispensers**
  - Thermo Multidrop Combi and Nano, Genetix, Perkin Elmer, Innovadyne,…
  - Non contact dispensing: LabCyte Echo etc.

- **Plate washers**
  - BioTek…

- **Plate readers**
  - Thermo, Tecan, FLIPR, Envision, ViewLux…

- **Other**
  - ABI, Acumen, Inheco, MDS, REMP, Tecan, Hamilton…
Bringing it all together with VWorks

- Event-driven automation control: designed to maximize throughput
- A single application that drives all levels of automation: large systems, benchtop systems, single instruments
- Enables true device pooling: maximize resource utilization and throughput while providing the benefits of redundancy
- Multi-vendor hardware support: consistent user interface and robust error handling.
- Configure and customize for your workflows: provide optimal performance and integration with your broader infrastructure.
- Standard-based XML and JavaScript
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BioCel ® System: Compound Management

- Fast and reliable delivery of compounds
  - Increase throughput
  - Reduce cycle time
  - Increase walk away time and reproducibility
- Radial layout reduces footprint, saves lab space and increases access to instruments
- Barcode, seal and track plates from sample store to assay plate for single point, replicate and dose response plates
- Integration with microtube and microplate storage
BioCel® System: Compound Management

- Maintain sample integrity with inert environment:
  - Integration with sample store
  - Inert/dry chamber for all liquid handling
  - Gas purging PlateLoc to seal samples with a protective layer of inert gas
  - Gas purging manifold to purge tubes with inert gas

- Complete traceability from sample storage through assay plate replication:
  - Integration of VWorks with LIMS
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BioCel ® System: Cell Based Assays and Cell Maintenance

- Flexible, fully automated systems for a wide range of cell based assays and plate based cell maintenance
  - Cell dispensing
  - Media changes
- Plug and Play instruments
- Wide choice of incubators, liquid handlers and readers
- ULPA filtration and temperature controlled environments available
Cell based reporter-gene assay system

Component List:

- Bravo, 384ST
- 3 x VStack
- VSpin/Access2 (below VCode)
- LidHotel
- Barcode reader
- 2 x Platepad
- Thermo Multidrop Combi (below Bravo)
- Biotek Washer ELX405
- Liconic Incubator STR44 (below VStacks)
- Berthold Mithras Plate reader
Multiple assay technologies on one system

- Capacity for 144 standard and 18 deep well, random-access, ambient temperature plate positions on each BioCel 1200
- System can simultaneously run 10 lidded plates using the plate lid hotel
- The two BioCels can be run together or two separate assays depending on throughput and capacity requirements
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- Case Study: Automating Laboratory Processes
  - Griffith University: Compound Management
  - iSTEM: Automatic Cell Maintenance and Cell-based Assay

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Conclusions

- Agilent’s technical innovation provides customers **Reliable, High Precise, flexible, Safe, Easy-to-use** and **Robust** automated systems for automating laboratory processes.

- Agilent Automation Solutions feature unique advantages from using **DDR technique, one button teaching** and **easy docking** etc. to differ from our competitors.

- Agilent Automation Solutions provide **total solutions** for customers in **Pharmaceutical, Drug Screening and Discovery, Genomics Research** *et al.*
Questions & Answers

Thank You