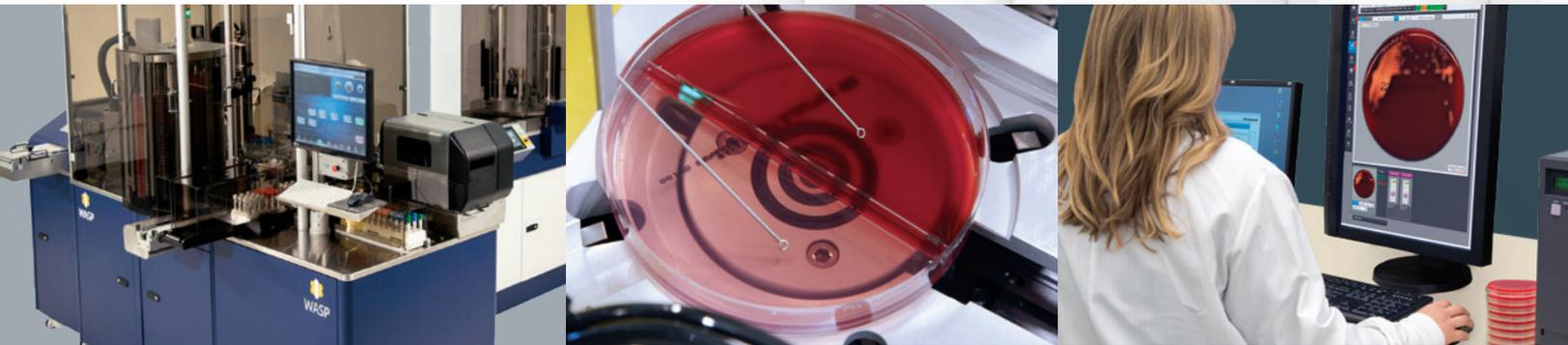




COPAN FULL LABORATORY AUTOMATION



**SPECIMEN PROCESSING, ALGORITHMS
AND DIGITAL MICROBIOLOGY SOLUTIONS**





INNOVATING TOGETHER, DEFINING THE FUTURE

THE FUTURE BELONGS TO THOSE WHO ENVISION IT.

Microbiologists today face tough challenges. Increased workloads, labor shortages and the impending retirement boom of Medical Technologists and laboratory professionals have compelled laboratories to look for more efficient, cost-effective ways to process the influx of samples.

With relentless innovation and unsurpassed collaboration, **COPAN** is facing those challenges head on. From the first automated specimen processor prototype to more than 500 instruments later, **COPAN** has solicited input from the Microbiology community. As a result, **COPAN's WASP®DT, WASPLab™, WASP-FLO™** systems, and new modules are designed as open, modular, and forward compatible, to meet the needs of each unique laboratory.



Specimen
Processing



Incubation



Analysis

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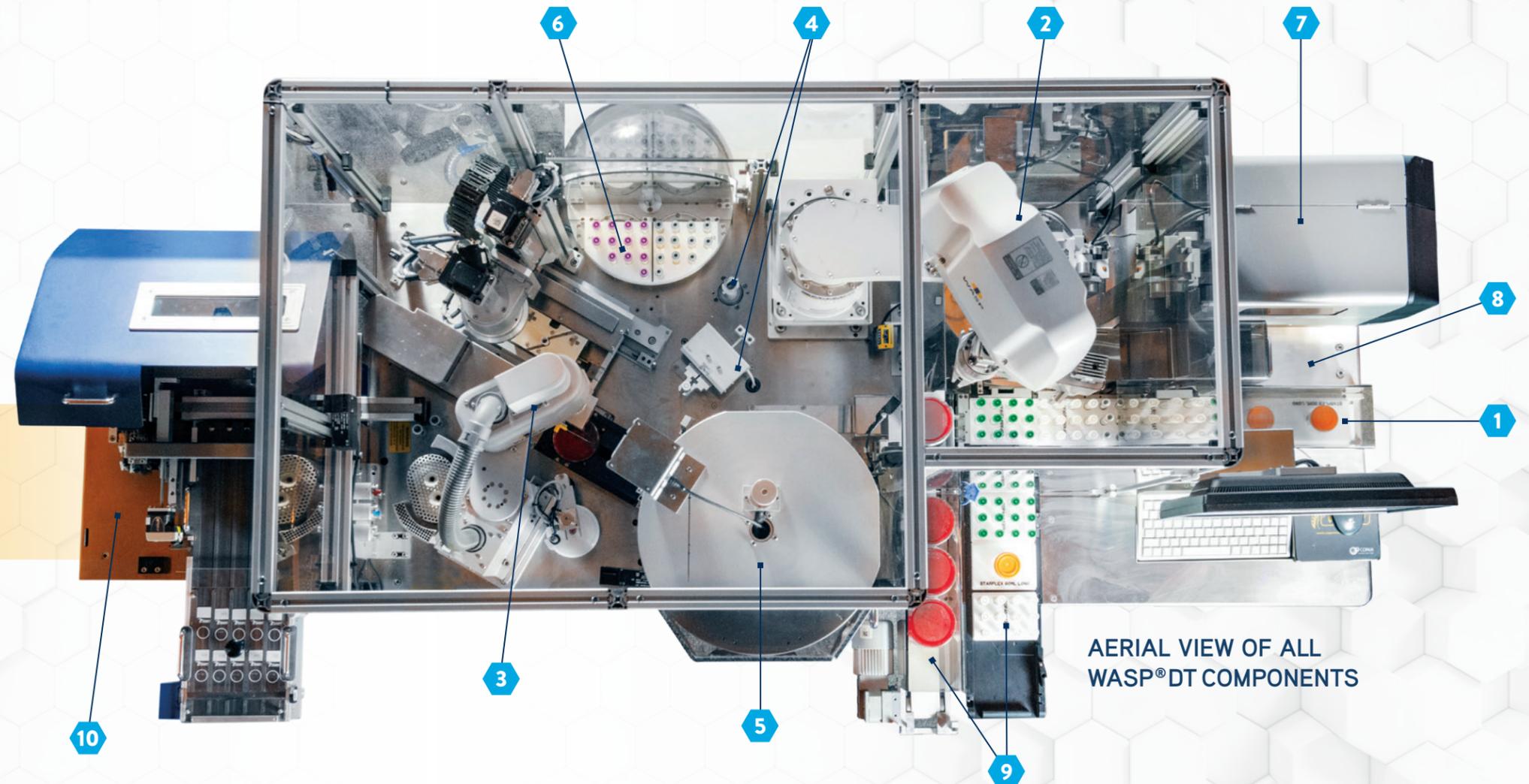


WASP[®] DT GIVES LABS THE FREEDOM TO WALK AWAY FROM SPECIMEN SET-UP AND FOCUS ON HIGH LEVEL TASKS

WASP[®] DT is an open platform, modular instrument, which fully automates all aspects of upfront Microbiology specimen processing: planting and streaking, Gram slide preparation, disk application and enrichment broth inoculation.

OVERVIEW OF WASP[®] DT COMPONENTS

- 1 Sample Entry Conveyor**
Continuous Load with No Need to Pause Instrument or Batch Samples
- 2 Robot 1 "Tarzan"**
Responsible for Specimen Handling
- 3 Robot 2 "Jane"**
Responsible for Specimen Processing
- 4 Spinner and Vortex**
Ensures Homogeneous Sample
- 5 Media Carousel**
Holds Up to 370 Plates, 9 Different Media Silos. Uses Any Manufacturer's Plated Media
- 6 Warehouse Carousel (optional)**
Houses Enrichment Broths and ID and Susceptibility Disk Dispensers
- 7 Printer**
Labels are Automatically Printed and Applied to Plates, Tubes, and Gram Slides
- 8 Rejection Bin**
System Segregates Rejected Samples so that Users Can Easily Find Unprocessed Samples
- 9 Sample Exit Conveyors**
Place Where Processed Samples and Plates are Unloaded
- 10 Gram SlidePrep[™] (optional)**
Automatically Prints Labels to Gram Slides



AERIAL VIEW OF ALL WASP[®] DT COMPONENTS



UPFRONT SPECIMEN PROCESSING

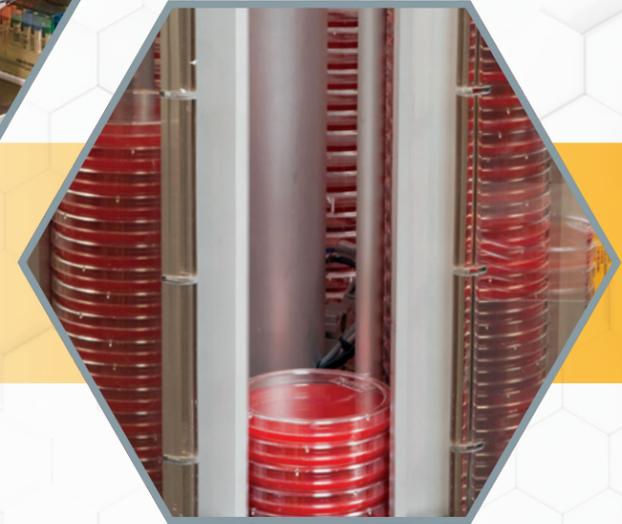
Automate Manual Tasks:

- Planting and Streaking
- Gram Slide Preparation
- Enrichment Broth Inoculation
- Subculture Preparation
- Kirby-Bauer and ID Disk Application



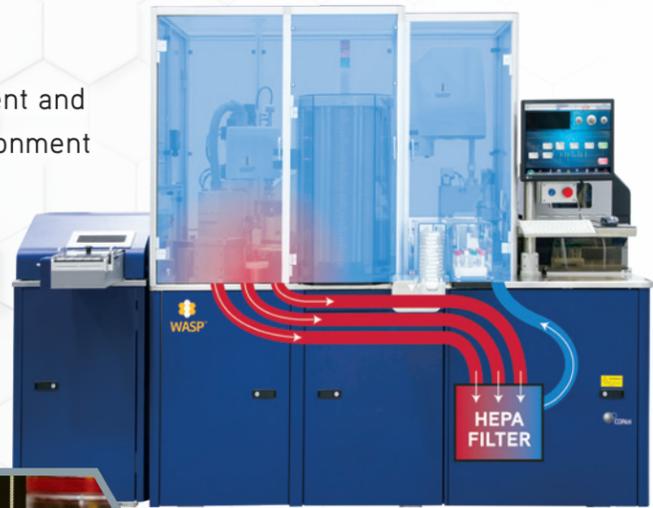
User-Friendly Experience

- Touch Screen Monitors and Easy to Use Software Interface



Accuracy, Reproducibility & Quality

- Individualized Specimen Management, Containment and Confinement Measures Ensure Clean Work Environment
- Versatile Protocol Options Drive Culture Quality, and Improve Sensitivity & Cost Efficiency
- Image Analysis Verification System Ensures Accuracy and Integrity of Loop and Presence of Inoculum
- Touch Screen Monitors and Easy to Use Software Interface for an Intuitive, User-Friendly Experience

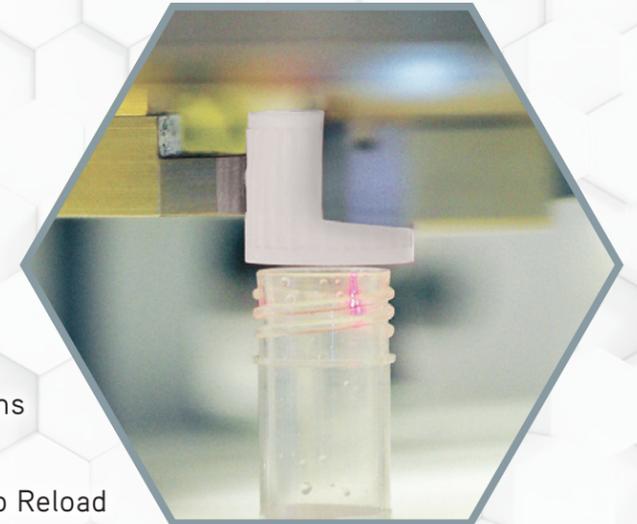


WASP[®] DT Image Analysis

Checks for the Presence of Inoculum and Correct Loop Size

Improve Patient Traceability and Eliminate Barcode Rejections

- Smart 360° Scan Technology Reads Specimen Barcode Labels Regardless of Position
- Labels on Completed Plates, Gram Slides and Inoculation Tubes are Reconciled to Patient Specimen Barcode for Traceability



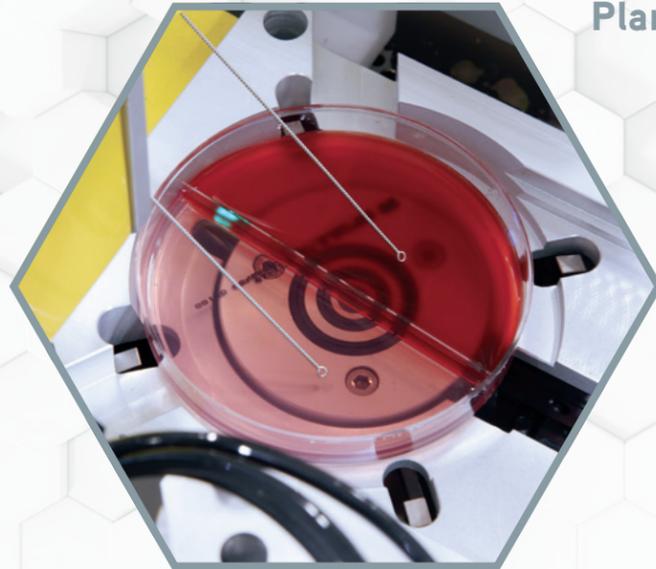
No Need to Batch

- Universal Decapper Automatically Opens and Recaps Sample Containers
- No Need to Batch or Stop Instrument to Reload



ADDITIONAL MODULES AND OPTIONS

FOR A CUSTOMIZED SOLUTION



Dual Streaking with 1µL Reusable Loop

Planting & Streaking Whole & Bi-Plates!

- Library of Classic or Customizable Streak Patterns for Whole Plates and Bi-Plates to Ensure Optimal Isolation
- Reusable Metal Loops Range from 1µL, 10µL & 30µL to Provide the Precise Volumes Necessary for Quantitative Analysis
- Reusable Metal Loops Keep Operational Costs Low and Allow Users the Option to Change Loop Between Quadrants for Optimal Colony Isolation Necessary High Load Specimens
 - Other Automated Systems Use Disposable Pipet Tips and Streaking Beads, which Increase the Cost of Consumables
 - Pipets Cannot Transfer Volumes Less than 10µL
- Dual Streaker Option for Streaking Bi-Plates for Fastest Throughput and Maximum Productivity

Optional Gram SlidePrep™ Module or Automatic Enrichment Broth & ID Disk Dispensing Module Increase Instrument Usability

Modular Configuration Allows for Scalability and Flexibility to Adjust Equipment to the Changing Needs of the Lab



Automatic Enrichment Broth & ID Disk Dispensing Module

Warehouse Carousel Houses Broths for Automatic Inoculation and Subcultures. Without Stopping the WASP®DT, it Dispenses the ID Disks (i.e. Optochin and Bacitracin), Completing the Specimen Setup Process



Gram SlidePrep™ Module

Automatically Prepares the Gram Slides, including Laser Printing the Patient Identification Labels, Eliminating the Need to Manually Pre-Label



LIQUID BASED MICROBIOLOGY

Liquid Based Microbiology (LBM™) Makes the Most Challenging Samples Easy to Automate

PRIOR TO AUTOMATION, COPAN recommends transitioning to Liquid Based Microbiology. LBM™ products allow for the highest utilization of WASP®DT by liquefying and standardizing sputum, feces, urine and swab samples.



SWABS

FECES

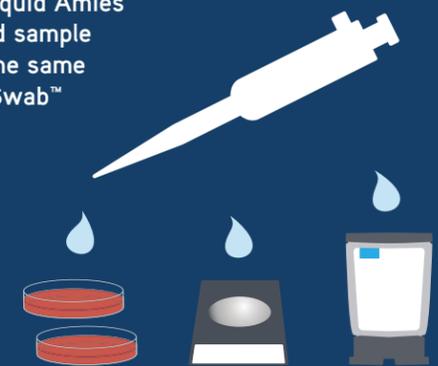
SPUTUM

URINE

Solid samples, such as tissues, or traditional swabs can also be processed on WASP®DT using the "Streak Only" mode.

ESWAB™ CAN BE USED FOR MULTIPLE TESTS

ESwab™ elutes the entire sample into the Liquid Amies providing up to 10 identical aliquots of liquid sample suspension to perform multiple tests from the same specimen. A recent study used the same ESwab™ sample for 8 different investigations.



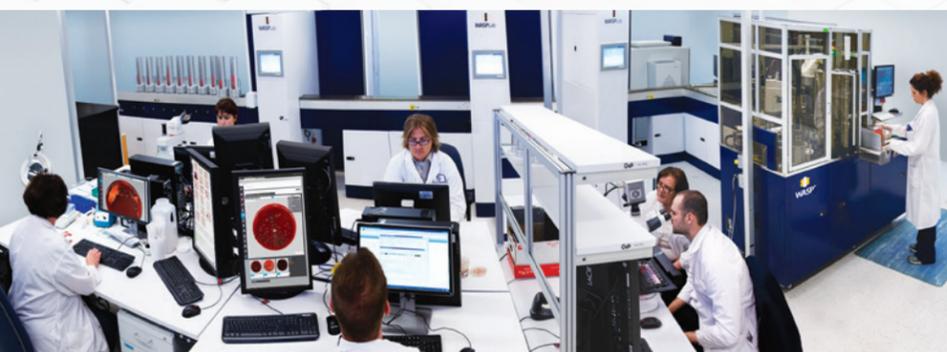
Van TT et al 2017. Prevalence of Fusobacterium necrophorum in children presenting with pharyngitis. J Clin Microbiol 55:1147-1153.



IMPROVE QUALITY AND PATIENT CARE WITH WASPLAB™

WASPLab™ is the continuation of automated specimen workup for Microbiology. WASPLab™ sets itself apart from other automated systems with its forward compatible and customizable track, incubators and imaging system.

WASPLab™ is a sophisticated barcode driven Microbiology specimen processor and work-up system, which connects to WASP®DT using a customizable conveyor track. Samples move from front-end processing to full specimen management or **TOTAL LAB AUTOMATION** including:



- Automated Incubation
- Digital Microbiology and Artificial Intelligence

SMALL FOOTPRINT ▪ HIGH EFFICIENCY ▪ MODULAR ▪ SCALABLE

OVERVIEW OF WASPLAB™ COMPONENTS

- 1 WASP®DT**
Automatic Specimen Processing including: Planting & Streaking, Gram Slide Preparation & Enrichment Broth Inoculation
- 2 Conveyor Track**
Transports WASP®DT Inoculated Plates or Manually Inoculated Plates to WASPLab™
- 3 Canister System**
Technologists Confirm Growth on a Computer Screen and Plates are Grouped by Growth or Bench Type and Sent to Canisters for Work-up
- 4 Loading Carousel**
Place Manually Inoculated Plates into the Loading Carousel to be Transferred to WASPLab™
- 5 Smart Incubators**
Incubators Create Homogeneous Atmospheric Conditions for Excellent Thermal Conductivity and Faster Colonial Growth as Reported and Validated by WASPLab™ Users
- 6 Image Acquisition**
Telecentric Linear Camera takes a TIME ZERO Image of the Plate, then Based on User Defined Protocols, at Subsequent Specified Time Intervals Thereafter
- 7 Reading Workstation**
Read, Interpret, and Segregate Bacterial Cultures at the Workstation Quickly using Artificial Intelligence and Digital Microbiology



GROW YOUR LAB WITH THE FREEDOM AND RELIABILITY OF WASPLAB™ TRACK, CAROUSEL AND CANISTER SYSTEMS



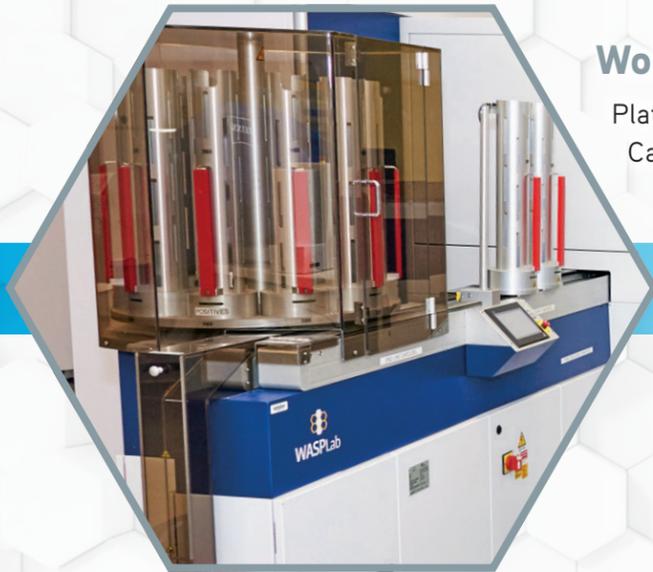
Conveyor Track

Customizable Conveyor Track Transports **WASP®DT** Inoculated Plates or Manually Inoculated Plates to **WASPLab™**
Two-Way, Track-to-Bench Solutions are Available Upon Request



Manual & Re-Loading Carousel

Place Manually Inoculated Plates, such as Blood Cultures, and Tissues, or Plates that Require Re-Incubation, into the Manual & Re-Loading Carousel to be Transferred to **WASPLab™** Via Conveyor Track, Ensuring Traceability



Work-Up Canister System

Plates that Need Work-Up are Sent to Canisters for Easy Plate Retrieval

WASPLab™ Components are Modular and Scalable

The System's Small Footprint and High Efficiency, Leaves Room for Growth Within the Laboratory as Additional Workbenches are Added

SHORTEN TURNAROUND TIME WITH WASPLAB™ SMART INCUBATORS



Improve Turnaround Time

Consistent Incubation Environment and Earlier Plate Reading can Result in Improved Turnaround Time* and Delivering Actionable Results within the Therapeutic Window Faster



Homogeneous Environment and Thermal Conductivity Incubators Bring Plates to Appropriate Temperature Quickly to Speed Up Bacterial Growth

- Each Plate Has a Unique Location for Rapid Retrieval
- Automatic Plate Inversion Based on Protocol to Prevent any Condensation on the Plate Lid Dropping onto the Agar Surface
- Easy to Clean with Removeable and Autoclavable Shelves
- High Capacity
 - Single: 795 Plates
 - Double: 1590 Plates



Boost Speed and Efficiency with Dual Robot System

WASPLab™ Smart Incubators House Two Robots for Fast Culture Plate Retrieval

- 1 Handling Robot**
 Moves the Plates
 - From Entrance to Shelf
 - Back to Exit When Imaging or Picking is Required
- 2 Concierge Robot**
 Performs Intermediate Tasks
 - Receiving Plates from Imaging
 - Receiving New Plates for Incubation
 - Holding Plates to Allow the Handling Robot to Prioritize Exit of Plates for Picking



SEE RESULTS CLEARER THAN EVER BEFORE WITH WASPLAB™ DIGITAL MICROBIOLOGY

WASPLAB™ IMAGE ACQUISITION TECHNOLOGY allows labs to make the most accurate work-up decisions by using a highly sophisticated lighting and camera system so that each plate image is clear and focused.

Upon entering the incubator, the **Telecentric Linear Camera** takes a critical **TIME ZERO** image of the plate for comparative differential image analysis - a fundamental step for the **PhenoMATRIX™** algorithms. Then based on user defined software, it will continue to image the plates at their programmed intervals.



0 hours

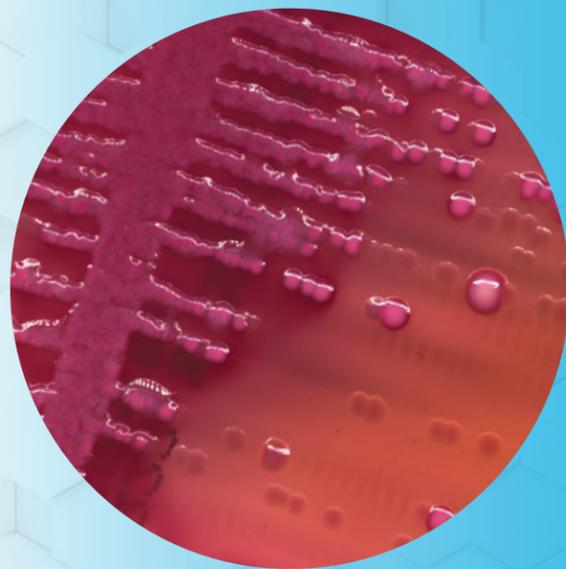


16 hours



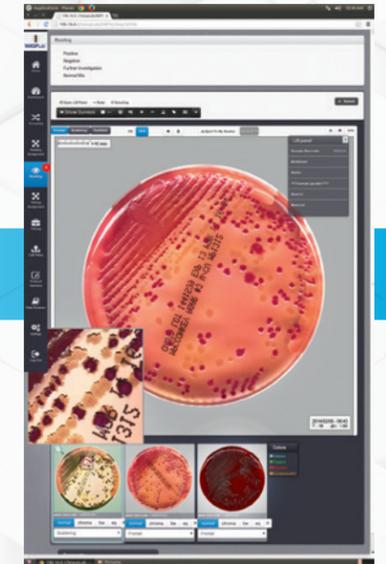
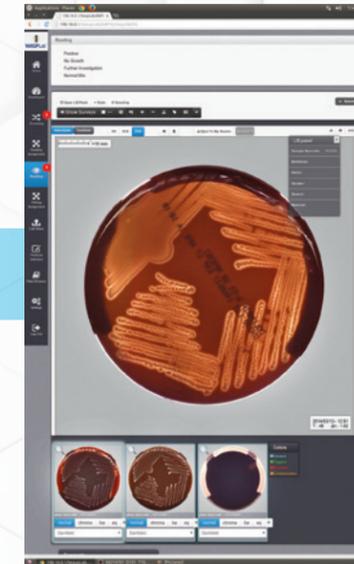
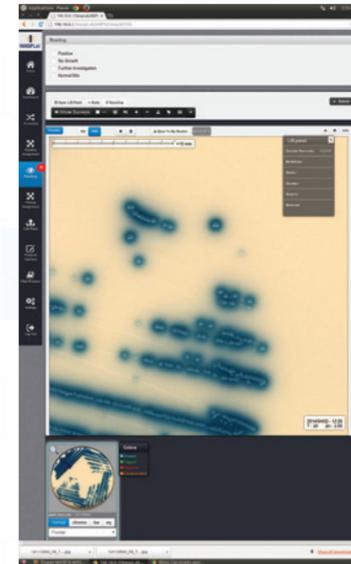
True Growth

Stop Eye Straining and Enjoy the Sharpest Images in the Industry with WASPLab™ Telecentric Linear Camera Optics



- Unique 27 MegaPixels for Larger than Life Images
- Enormous 9mm Depth of Field to Focus on Colonies Both Large and High or Small (as 0.1mm) and Low to Ensure No Growth is Missed
- Three Different Lighting Systems to Choose from to Capture Optimal Plate Images
- Constant Magnification, Eliminating Perspective Angle Error so Images are Undistorted for Precise Colony Location and Picking

Three Different Lighting Systems to Choose from to Capture Optimal Plate Images



WASPLAB™ DIGITAL MICROBIOLOGY SOFTWARE INTEGRATES WITH THE LIS TO PROVIDE PATIENT DETAILS FOR BETTER CARE

- Comprehensive Snapshot of the Patient's Demographics to Guide Most Effective Treatment
- Images are Stored in the Software to be Used for Training or Traceability
- Monitor Growth in Real Time and Read Plates When They are Ready to be Read, Improving Turnaround Time
- Never Touch a Negative Plate with Built-in Segregation Software for Batch Resulting of No-Growth Samples

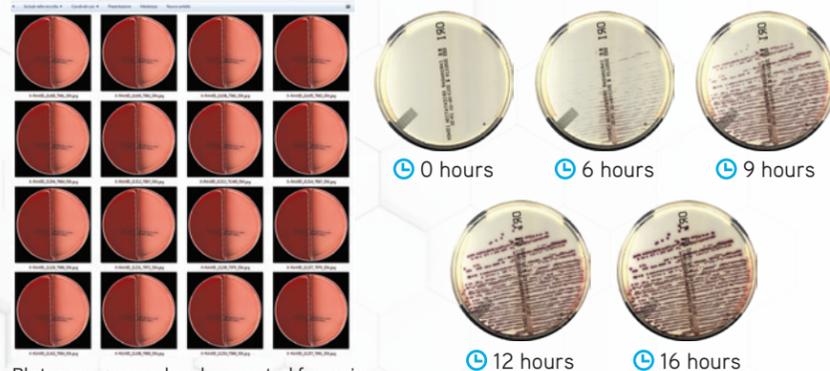


DIGITAL MICROBIOLOGY: WASPLAB™ TOTAL LABORATORY AUTOMATION INCLUDES IMAGE ANALYSIS SOFTWARE, MOVING MICROBIOLOGY TO THE DIGITAL AGE

SCREEN, READ, PICK AND REPORT IN AN INSTANT

1 SCREENING – Discard Negatives Quickly

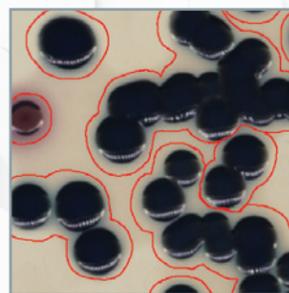
- All Plate Images are Presented to the User for Review
- PhenoMATRIX™ Software Algorithms Groups Images of Plates Based on User Selected Colony Counts
- Users Send Plates Requiring Further Investigation to Reading and Rapidly Results and Discards Negatives



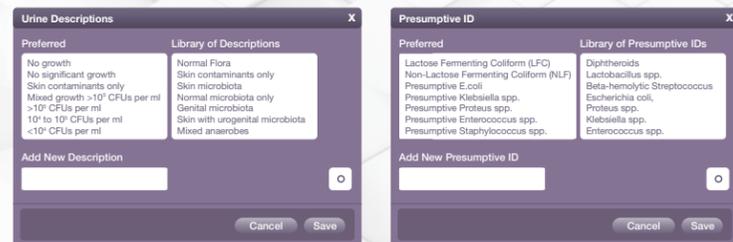
Plates are grouped and presented for review. Cultures with no significant growth or skin contaminants can be rapidly resulted, in the screening process.

Toggle quickly to review and compare growth on the same culture plate at different incubation time points.

OR PhenoMATRIX™ will automatically sort out the "no growths" and can result up to 30 negative samples at once.



Using differential image analysis, WASPLab™ uses a preliminary colony count to group plates by CFU's, which are then presented to the reader for verification.



Example of WASPLab™ user defined drop-down menu which allows users to select from a list of reporting descriptions which can match LIS reporting criteria.

2 READING – Focus on Plates that Require Investigation and Expertise

- Plates Requiring Further Investigation are Displayed in the Reading Area
- Users Can Zoom and Tag Colonies with Presumptive Identifications
- Work-Up Tickets are Created (MALDI-TOF, AST, Subculture, etc.)

3 PICKING – Users Obtain Presumptive Positive Plates from Canisters and Bring Them to the Bench for Work-Up

- After Scanning the Plate, Images are Displayed with Digitally Tagged Colonies and Work-Up Instructions
- Upon Completion of the Tasks, the User Acknowledges the Conclusion in the Software and Closes Out the Ticket Before Moving to the Next Sample



4 REPORTING – WASPLab™ Software Sends the Results to the LIS and Archives the Results

Digital Microbiology Allows
Laboratory Professionals to
Quickly and Accurately Read and
Share Information with Healthcare
Providers, Bringing Microbiology
Back to the Patient Bedside



PhenoMATRIX™ AND DIGITAL MICROBIOLOGY

NEVER TOUCH A NEGATIVE PLATE AGAIN
AND SPEED TIME TO RESULTING WITH PHENOMATRIX™

UNPARALLELED IN THE INDUSTRY, WASPLAB'S PHENOMATRIX™ offers users an exclusive selection of highly sophisticated algorithms. Through advanced Artificial Intelligence (AI), the software automatically recognizes organisms allowing microbiology labs to read, interpret, and segregate bacterial cultures with the click of a button with 100% sensitivity!



PHENOMATRIX™ ALGORITHM SUITE INCLUDES:

Urine Culture Segregation Based on Colony Counts with Growth/No Growth Discrimination

Customizable User Defined Thresholds for Growth/No Growth Counts Colonies for Faster Urine Culture Reading



Colony Counting

Sources:

- 1) Faron, M. L., Buchan, B. W., Coon, C., Liebrechts, T., Bree, A. V., Jansz, A. R., ... Ledeboer, N. A. (2016). Automatic Digital Analysis of Chromogenic Media for Vancomycin-Resistant-Enterococcus Screens Using Copan WASPLab. Journal of Clinical Microbiology, 54(10), 2464-2469. doi:10.1128/jcm.01040-16.
- 2) Faron ML, Buchan BW, Vismara C, Lacchini C, Bielli A, Gesu G, Liebrechts T, van Bree A, Jansz A, Soucy G, Korver J, Ledeboer NA. 2016. Automated scoring of chromogenic media for detection of methicillin-resistant Staphylococcus aureus by use of WASPLab image analysis software. J Clin Microbiol 54:620-624. doi:10.1128/JCM.02778-15.
- 3) Kim TJ. 2016. Automatic digital plate reading for surveillance cultures. J Clin Microbiol 54:2424-2426. doi:10.1128/JCM.01279-16.

Chromogenic Detection of any Organism of Interest (MRSA, VRE, ESBL, GBS)

Accurately Detects and Differentiates Organisms on Any Manufacturer's Chromogenic Agar for Fast Results



Automatic Detection of Organisms on any Chromogenic Medium^{1, 2, 3}



Automatic Colony Recognition

Technologist Report to LIS:
>10⁵ cfu/ml E.coli
Colony Recognition Software:
>10⁵ cfu/ml E.coli
99% probability

Technologist Report to LIS:
>10⁵ cfu/ml Enterococcus
Colony Recognition Software:
>10⁵ cfu/ml Enterococcus
99% probability

Automatic Colony Recognition on Standard Medium

Recognizes Bacterial Colonies by Comparison against its Massive Phenotypic Database to Standardize the Interpretation of Bacterial Cultures and Optimize Workflow Efficiency

Application of User-Defined Expert Rules to Filter Outputs and Reporting

Applies Each Laboratory's Personalized Rules Combined with Demographic Information from a Patient's LIS Record for a Higher Level of Culture Segregation, Providing an Additional Filter for Standard Report Outputs



Expert Rules Filter

Sex: Female Age: 27
Colony Recognition: Presumptive Group B Streptococcus
Recommendation: Confirm identification and AST work up

PhenoMATRIX™ Algorithms are Optional Additions to the WASPLab™ Software and can be Purchased Individually.

To Learn More or for a Full List of Available Algorithms, Contact Your Local WASPLab™ Representative Today!

DIGITAL MICROBIOLOGY

AND WORK-UP STATIONS



These Ergonomic Stations Afford Labs the Freedom to Grow and Move, while Performing the Important Tasks of Reading, Screening, Picking and Resulting at their Bench

- Ergonomically Designed Interpretation Workbenches for Maximum Comfort
- Advanced Smart Zoom Technology for Users to Pinpoint Colonies that Could be Missed by the Human Eye
- At the Picking Station, Technologists Scan the Plates' Barcode to Retrieve Images and the Worksheet with the Pre-Selected Colonies Tagged with Presumptive ID's
- Archive Images for Quality Assurance and Teaching Purposes to Create a Unique Library for Unique Organisms



WANT MORE FROM YOUR AUTOMATION?



OPTIONAL MODULES FOR TOTAL LABORATORY AUTOMATION

AUTOMATION IN MICROBIOLOGY is not simply bringing a plate to a workbench via track. Instead, it's about maximizing efficiencies anywhere possible, so that Microbiology labs can positively impact patient care. That's why **COPAN OFFERS EXCLUSIVE ADDITIONS THAT ENHANCE YOUR LAB'S CAPABILITIES TO EMPLOY A COMPREHENSIVE COLLECTION OF MODULES FOR TOTAL LABORATORY AUTOMATION.**

WASP-FLO™ STREAMLINE SAMPLE LOADING

LABORATORIES WITH MULTIPLE WASPLAB™ LINES benefit from WASP-FLO™ for streamlining sample loading. WASP-FLO™ bulk loader automatically sorts samples and directs them to the appropriate WASP®DT. By utilizing a barcode reader, WASP-FLO™ automatically places the sample in the corresponding pallet, to be processed on WASP®DT, once the pallet is full.



Load Samples Indiscriminately and Eliminate Batch Processing

- Randomly Load Samples into WASP-FLO™
- Automatic Sorting and Routing of Samples Increases Efficiency & Throughput



WASP-FLO™ Productivity is Equivalent to at least 2 FTE's

COLLABORATIVE ROBOT MANAGES MANUAL PROCESSES AUTOMATICALLY

COPAN's Exciting New Collaborative Robot Can Automate Many Processes that were Previously Done Manually, Such as Processing Positive Blood Culture Bottles, Tissues, Wound Aspirates, Sterile Body Fluids or Traditional Swab Samples. Users simply scan the specimen barcode and the robot will present the precise sequence of pre-labeled plates or tubes. After the plates are manually seeded, the Collaborative Robot streaks the plates and places them on the conveyor track to the WASPLab™ incubators.

Collaborative Robot Capabilities:

- Eliminates Transcription and Transposition Errors from Manual Processes
- Presents the Precise Sequence of Plates and Materials for Any Task or Any Specimen Setup
- All Tasks are Performed within HEPA Filtered Environment
- Allows Automation of Many Tasks and Procedures Previously Done Manually
- Modular Work-Pods Expand the Robotic Capabilities to Include Automated AST and ID setup



PRODUCT SPECIFICATIONS

WASP®DT

Dimensions:	3.625 feet wide x 6.79 feet long x 6.33 feet high
Weight:	Approximately 1,300 lbs
Input Voltage:	220V, 20Amps
Network Ethernet:	100 MB
Interface:	LIS interface available upon request
Peripherals:	Touch Screen Monitor, External Barcode Reader, Label Printer
Certifications:	CE, UL, CSA
Electrical Receptacle Plug:	HBL2321 250V / 20A (for USA and Canada)

GRAM SLIDEPREP™

Dimensions:	2.3 feet wide x 1.9 feet long x 4.1 feet high
Weight:	Approximately 221 lbs

INCUBATORS

Dimensions Single:	3.8 feet wide x 2.8 feet long x 7.6 feet high
Dimensions Double:	5.7 feet wide x 2.8 feet long x 7.6 feet high
Weight:	Approximately 1,000 lbs (Single) Approximately 2,000 lbs (Double)
Input Voltage:	220V, 20Amps
Atmospheric Conditions:	CO ² and Aerobic
Capacity Single:	854 plates
Capacity Double:	1,708 plates
Electrical Receptacle Plug:	HBL2321 250V/20A (for USA and Canada)

WASP-FLO™

Dimensions:	WASP-FLO™ Hopper Module: 3.4 feet x 4.5 feet x 6.6 feet WASP-FLO™ loading module: 3.4 feet x 3.2 feet x 5.8 feet
WASP-FLO™ conveyor:	According to specific layout
Weight: WASP-FLO™ hopper module:	270 kg
WASP-FLO™ loading module:	745 kg
WASP-FLO™ conveyor:	Weight variable according to layout, approx. 100 kg/m per single conveyor (800 W WASP-FLO Loading Module+ 1200 W WASP-FLO Conveyor)
Electrical Specifications:	208-240 VAC, 50/60 Hz, 2000 W max
Operating Conditions:	Up to 2000 m
Height:	From 0 to 95%
Humidity:	From 5 °C to 40 °C
Temperature Range:	