Technology

LBM®

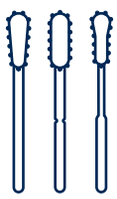
Liquid-Based Microbiology™

The liquid state of the art

Transform any specimen into a sample that is easy to process

Copan
innovating together

don whitley scientific
culturing innovation



Collection

Transport

Processing

Artificial Intelligence

Workflow-Integrated System Environment

What's Liquid-Based Microbiology?

Another step toward the preanalytics revolution

If the times of semi-solid agar-based sample transport systems are long gone, it's thanks to the conception of Copan's Liquid-Based Microbiology™. Evolved from the revolutionary FLOQSwabs®, **Liquid-Based Microbiology™ is the gold standard of microbiology specimen transport that transforms specimens into easy-to-process, automatable, and multi-purpose liquid samples.** Since the introduction of eSwab® back in 2006, the LBM® family has grown ensuring every specimen can be **collected, transported, or processed in a liquid medium.**

Why Liquid-Based Microbiology?

Designed to meet the needs of the modern lab

Contemporary clinical microbiology laboratories face significant challenges with demands to optimise their workflow and minimise costs[1]. Additionally, advances in healthcare and the COVID-19 pandemic have made it necessary for labs to incorporate molecular biology and novel diagnostic techniques into their daily routines[2]. Not keeping up with these changes could have serious consequences. To support these labs in improving their workflow, we developed the concept of Liquid-Based Microbiology™ as an alternative to traditional gel media.

GEL		LBM
One sample – one test		One sample – many tests
Low testing flexibility		High sample flexibility
Different devices needed depending on the application	VS	Same collection devices for most of the applications
Needs preparation at lab site		Ready to analyze
Not compatible with NAAT		Compatible with NAAT
Good preservation of bacteria viability[19]		Best preservation of bacteria viability[19]

The benefits of LBM

LBM's pioneer preanalytics solution offers numerous advantages for microbiology labs seeking efficiency and high-quality results[3]. **The same specimen collected with a multipurpose LBM media can be used for a broad range of applications**: culture, Gram stain, antigen detection, and molecular assays. **This eliminates the need for multisampling, improving patient comfort, reducing plastic waste and operational costs associated with stocking numerous collection devices and collected samples**. Moreover, samples in a liquid format are **easily processed on automated specimen processing instruments, reducing manual processes and workload for medical and laboratory staff, bringing standardisation to the next level.**

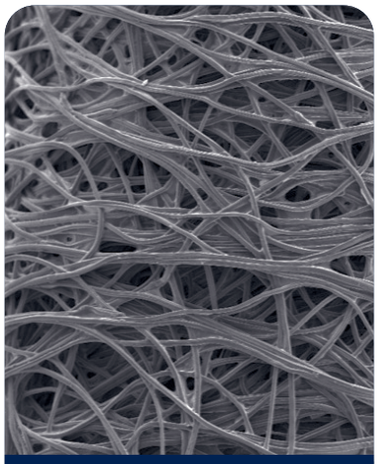
Pros for everyone

FOR THE **LABORATORY**	Ready to use sample	
Less risk of receiving poor samples - fewer refused samples	Automatable	
Long stability	Flexible for any testing technology	
Reduces workload	Reflexing test always possible	
Reflexing test always possible	Low risk of contamination	
Reduced hands-on time	Broadly validated by diagnostics companies	

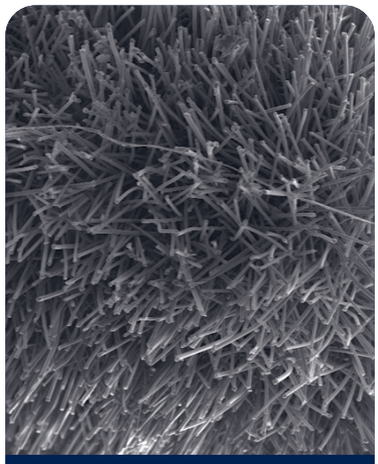
FOR THE **PATIENT**	More comfort thanks to the FLOQ technology	Avoids multisampling
Ergonomic, anatomic swab design and softer texture	Less invasive sample collection	No more unpleasant aluminum shafts for NP, urethral, ear, and eye collection
FOR THE **COLLECTION STAFF**	Fewer collection devices	Improves standardisation
Standardised training for all the devices	Reduces the risk of using the wrong device – less risk of recalling the patient	More efficient stock management
FOR THE **HEALTHCARE CENTER PROCUREMENT**	Fewer codes to manage	Fewer plastics – reduced waste and more sustainability
IVDR and MDR ready	Less risk of scrap and discard	Reduces cost of the logistics

Where it all started

FLOQSwabs® is the swab that reinvented sample collection. It consists of a customisable molded plastic shaft and a tip coated with perpendicular short Nylon® fibers – applied through our patented FLOQ® technology – that ensures **a quick, capillarity-driven sample uptake and an efficient elution of the biological specimen**[4,5,6]. All our LBM® media can be paired with FLOQSwabs® to expand your downstream testing capabilities and ensure an unmatched specimen collection in many anatomical collection sites.



Microscope image of fiber swab



Microscope image of FLOQSwabs®

Superior performance

Unlike other swabs, FLOQSwabs® have no internal core to trap the sample, allowing rapid adsorption and ensuring fast elution of more than 90% of the sample.

Designed for multiple collection sites

Various shaft and tip dimensions made FLOQSwabs® a well-accepted alternative to invasive and costly collection procedures in many anatomical sites.

Multipurpose collection and transport media for traditional bacteriology culture

Copan Liquid Amies Elution Swab (eSwab®) is our multipurpose medium designed for collecting and transporting swab specimens from the collection site to the testing laboratory. eSwab® **stabilises the viability of aerobes, anaerobes, and fastidious bacteria from swab specimens for bacterial culture**. Additionally, it can be used to preserve **bacterial, viral, or Chlamydial antigens and nucleic acids from swab specimens for antigen and molecular testing.**

Advanced stability and preservation

eSwab® stabilised the viability of all the organisms tested for 48 hours at room and refrigerated temperature[7], except for *Neisseria gonorrhoeae* cultures, which should be processed within 24 hours. It preserves bacterial, viral, or Chlamydial antigens and nucleic acids from swab specimens for five days at room temperature, 7 days if stored at 4°C, and up to 6 months if stored at -20°C[8,9].

CLSI M40-A2 compliant and 510(k) cleared

eSwab® is compliant with CLSI M40-A2 Quality Control for Microbiological Transport System standards, and 510(k)-cleared by FDA.

Multiple testing capabilities

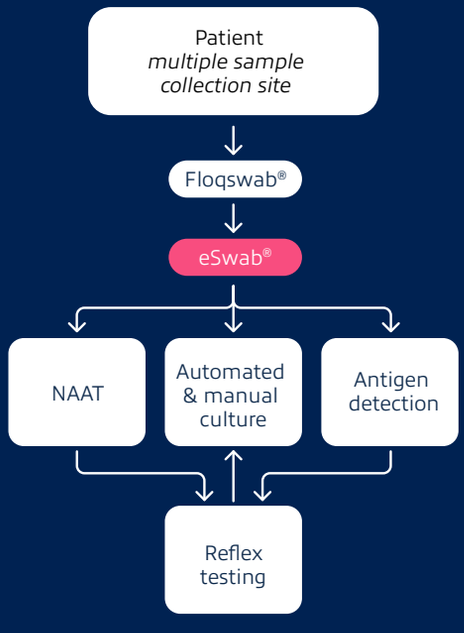
eSwab® is compatible with a broad range of downstream testing applications. Thanks to its liquid formulation, it can be used to run various tests from a single specimen, reducing the costs of multiple sampling and stocking. eSwab® is the only Amies-based transport media with an official claim for the use with NAAT, already validated and included in over 20 IFU of diagnostics molecular assays.

Scientific soundness

Over the past 15 years, eSwab® has been cited in more than 120 peer-reviewed papers.

Versatile

eSwab® is available in combination with different swab geometry to fit any collection site and as an MRSA collection kit, in combination with 2 or 3 swabs for this specific application.



Collection, transport & preservation device for enteric pathogens

FecalSwab® is a modified Cary-Blair medium designed to stabilise enteric pathogenic bacteria's viability during transport to the testing laboratory. It features higher preserving properties at different storage conditions than traditional media and dry containers, and it is validated **for bacterial culture10 and molecular-based assays**[11,12,13]. Compatible with both stool and rectal swabs, FecalSwab® is available with a standard FLOQSwabs® and a specialized FLOQSwabs® with a stopper to collect anal, perianal samples, and feces.

The right device for the evolving GI diagnostics

FecalSwab® perfectly matches the need of an evolving GI diagnostics landscape. From culture to NAAT, its flexibility allows FecalSwab® to be used in any testing workflow, with the possibility of having enough high-quality samples for reflex or backup testing.

Sample stability

FecalSwab® preserves collected specimens for 48h at room temperature or 72h at refrigerated temperature. In the case of *C. difficile* culture investigation, Copan FecalSwab® stabilises collected specimens for up to 24h at room temperature and 48h at refrigerated temperature.

Enhanced shelf-life and simplified transport

FecalSwab® VI-PAK metallic foil and plastic film barrier block oxygen entry, preventing unwanted oxidation of the transport medium. In addition, its shatterproof tubes are a compact and neat alternative to large, bulky transport containers.

Rectal and stool sampling

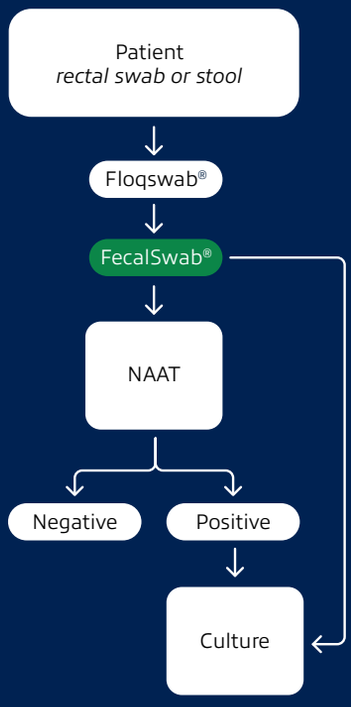
Fecalswab® can be used by medical staff to transfer a small amount of sample from the primary stool collection container or to collect a rectal swab sample directly.

CLSI M40-A2 Compliant

FecalSwab® is compliant with CLSI M40-A2 Quality Control for Microbiological Transport System standards.

FDA 510(k) cleared for both culture and NAAT

FecalSwab® is FDA 510(k) cleared for bacterial culture application as well as for use as a transport system for molecular testing with BD Max Enteric panel and Extended Enteric panel. It is also included in numerous IFU of GI panel assays.



Universal medium
for collection, transport, and preservation of viruses

UTM® is our Hanks' Balanced Salt Solution, suitable for the **collection, transport, and long-term freeze storage of viruses, chlamydia, mycoplasma, and ureaplasma**. UTM® is compatible with viral culture, antigen detection[14], and molecular assays[15].

Enhanced stability

UTM® HBSS's unique formulation includes proteins, sugars, and a pH indicator to preserve viral viability for 48 hours at room temperature. In addition, its antibiotics and antimycotics prevent the overgrowth of bacterial and fungal flora.

Convenient format

UTM® capture-cap – to dock and secure the swab shaft for easier tube handling – skirted, shatterproof conical tubes, and multiple (1 - 10 mL) fill volumes ensure safe handling and versatility.

Glass beads

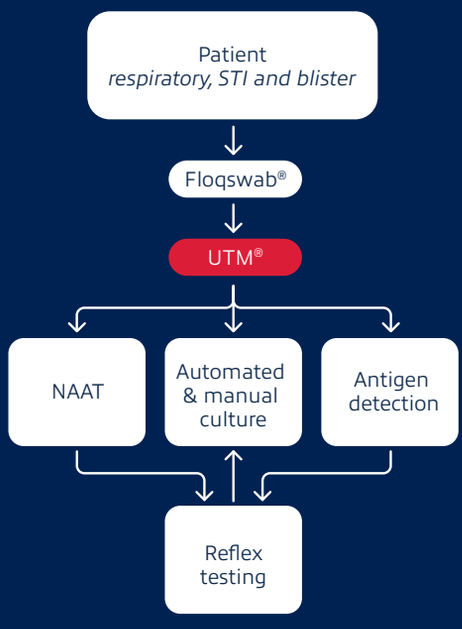
Three glass beads in each tube facilitate the release and dispersion of patient material and virus particles from the swab during vortexing.

CLSI M40-A2 Compliant

UTM® is compliant with CLSI M40-A2 Quality Control for Microbiological Transport System standards.

Virology Gold standard

Over 50 virology diagnostic tests included UTM® as the preferred sample transport media.



Sputum-liquifying device for respiratory tract pathogens

LBM® SLsolution™

SLsolution™ (Sputum Liquefying solution) is a ready-to-use **mucolytic agent for the rapid liquefaction of sputum specimens**[16]. SLsolution™ can be used before the plating and streaking of fungi and bacteria (*Mycobacteria spp.* excluded) that cause respiratory tract infections without affecting their vitality and morphology.

Quick fluidification

Effective sputum fluidification after 30 minutes at room temperature. SLsolution™ has been tested and validated for liquefying sputum samples prior to culturing for the isolation of bacteria and fungi without affecting the morphology, growth, or microscopic staining and appearance of pathogens.

Simplified fluidification phase

SLsolution™ is available in bulk, in a kit with a single-use transfer pipette, or a kit with the Sputum Dipper. The combination of SLsolution™ with the Sputum Dipper – our tool designed to ease the processing of sputum samples – helps to eliminate issues caused by viscous samples.

No rehydration needed

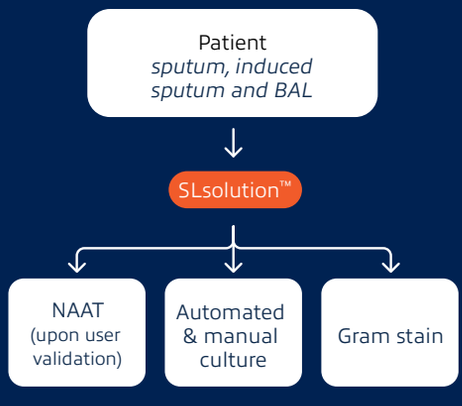
No need for rehydration of powder or dilution of liquid concentrate. SLsolution™ is ready to be mixed with your sample.

Preservation and shelf-life

SLsolution™ comes with a shelf-life of 12 months at room temperature. Preservation of microorganisms is guaranteed for up to 6 hours at room temperature.

Convenient

With SLsolution™, you can avoid the costs and waste of making your own reagents for liquifying sputum.



Still skeptical?

A real-life experience

Read Prof. Carla Fontana's real-life experience in switching from gel-based to liquid media.

"In our laboratory, we adopted the LBM system in 2008 and used it for a variety of tests, including culture, Gram staining, and many molecular assays. […] ***The Copan LBM device family has allowed us to optimise workflow in the laboratory, especially with its suitability for a variety of testing methods****, […] Our findings demonstrate the appreciable changes in the workflow and, of course, the advantages due to the LBM introduction.* ***Unification of collection systems can reduce manual processing and determine the standardisation of procedures****. All of these are basic stages that microbiologists must prepare to accept and introduce in the laboratory for good microbiological practice and the benefit of the patient. The real challenge for microbiologists, in the coming years, is the ability to catch the novelties and to introduce them in the diagnostic process also by adapting and connecting them to several different technologies. We believe that our work is an example of this process of changing."*[3]

Figure 1. Central role of LBM devices in a multidirectional and multi-tasking laboratory.

Liquid-Based Microbiology™ broths for every need

Among transport and processing media, the Copan LBM® family includes a **full range of enrichment and selective broths** for the most common aerobic and anaerobic bacteria. All of them are stable at room temperature, don't need pretreatment and preparation, and their screw cap tube format fits most laboratory equipment.

Ready to use → Save preservation time

Single use → NO waste

Room temperature storage → NO refrigeration needed

Selenite Broth™

Selenite Broth™ is a selective and enrichment broth for *Salmonella enterica spp* and *Shigella sonnei*. It is compatible with both classic stool samples and FecalSwab® samples.

TSB Salt Enrichment Broth™

TSB Salt™ is a medium specifically intended for the isolation of *S. aureus spp.* After incubation, TSB Salt Broth™ is intended to enrich a specimen suitable for subculture on selective MRSA agar plates.

BHI (Brain Heart Infusion) Enrichment Broth™

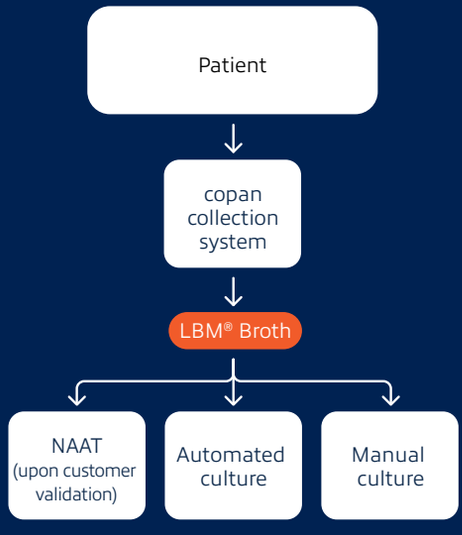
BHI broth™ is a medium specifically intended for fastidious bacteria, including *Streptococcus pneumoniae* and *Staphylococcus aureus*.

LIM Enrichment Broth™

The LIM medium™ is a modification of Todd Hewitt Broth and is specifically intended to isolate and enrich Group B Streptococcus.

Thiol Broth™

Thiol medium™ is a universal enrichment broth for anaerobic bacteria and obligatory microorganisms. Its tube is also designed to enable turbidity check for strict anaerobes after 24h.



eNAT®

Copan eNAT® System is intended to collect, transport, and preserve clinical specimens to be analyzed by nucleic acids amplification techniques.
eNAT® medium stabilizes and preserves RNA/DNA for prolonged periods and is compatible with commercial nucleic acid extraction and amplification platforms.

FLOQSwabs®

Ensure a quick, capillarity-driven sample uptake and a superior elution of the biological specimen, expanding downstream diagnostic testing capabilities.

DNA and RNA stabilization

eNat® Guanidine thiocyanate-based medium inactivates nucleases and stabilizes RNA and DNA of Viruses, Bacteria, Chlamydia, Protozoa, and Mycoplasma.

Compatible with molecular assays

eNat® has been validated with numerous molecular assays. Its format is suitable for automatic specimen processors in space-saving, instrument-ready tubes.

Inactivation within 30 minutes

eNat® completely inactivate microbial viability within 30 minutes to ensure a safe specimen handling, processing, and transport.

WASP®

Gone liquid? Go automated.

Compared to gel media, **liquid media can be easily processed on automated specimen processors and liquid handling systems**, minimising manual touchpoints for reduced human error, unparalleled precision, and improved standardisation. All Copan LBM® tubes are designed especially to be loaded and processed by our Walk-Away Specimen Processor (WASP) for bacteriology applications and Universe for molecular biology sample preparation.

Full Lab Automation

And it's just the beginning!

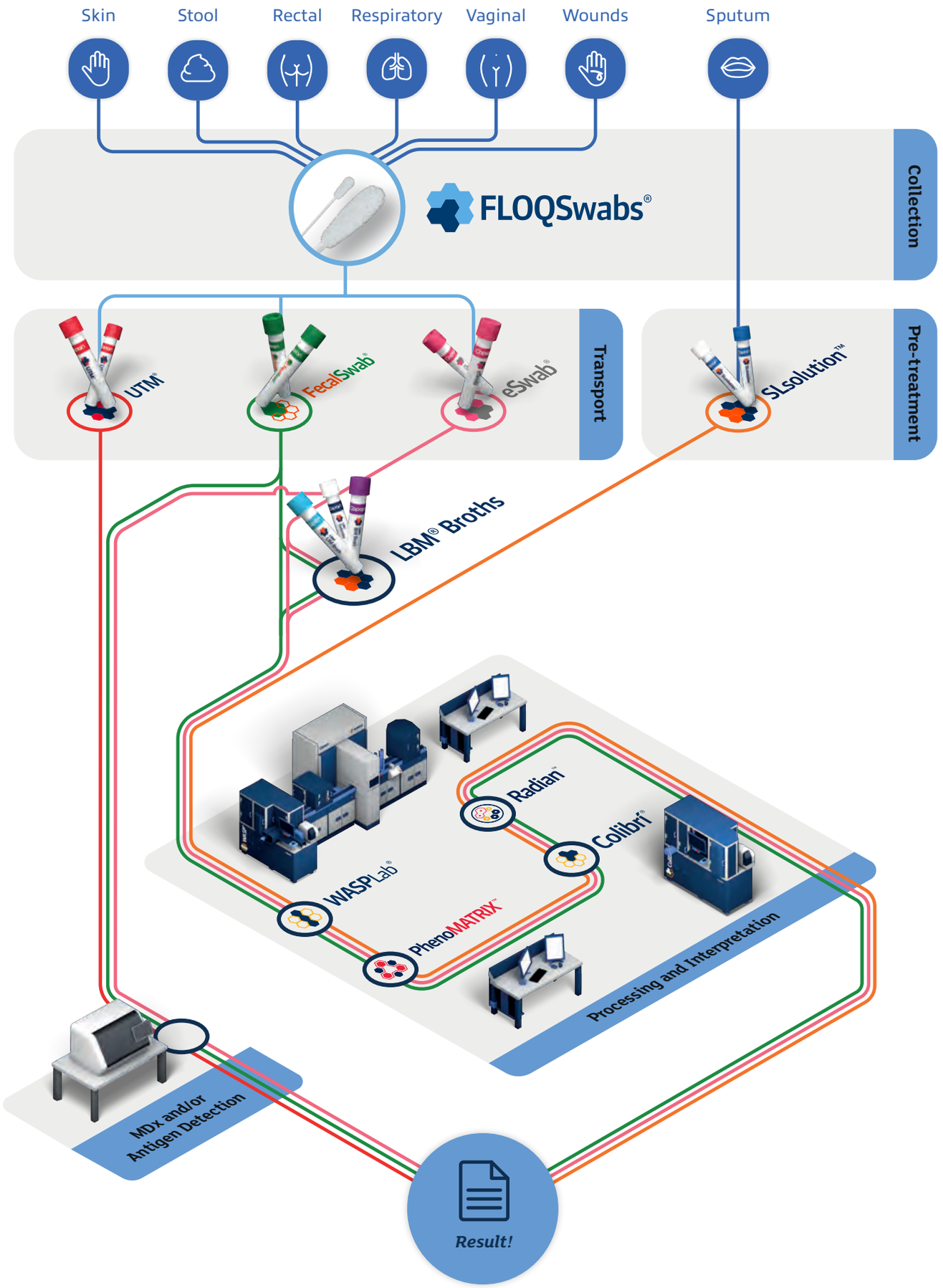
WASP® is just your first step into microbiology automation. Copan's WASPLab® preanalytical full lab automation ecosystem begins at the streaking phase and, combining hardware modules with integrated image analysis software and artificial intelligence, takes care of reading, interpreting, and picking activities[17,18].

Service

Make the first move

Ready to switch to better Microbiology?
We provide hands-on expertise to facilitate new product implementation. Moreover, our in-house R&D, design, and manufacture guarantee prompt fine-tuning, service, and customisation of your whole preanalytics workflow.

Contact us, and we'll discuss to assist with training, guidance, and more!



This picture is meant only for flow demonstration purposes and the data reported are not intended to replace the Instructions for Use (IFU). Always refer to the IFU for the final application compatibility or refer to a Copan representative.
For molecular and antigen detection applications refer to the device's manufacturer IFU for final compatibility

Below you can find a selection of the best-selling formats of our Liquid-Based Microbiology media.
For the complete list of product codes, please consult our website, or contact us.

Ordering information eSwab®

Cat N.	Description	Pack size	Sample*
SDW01120	Screw-cap tube filled with 1 ml of Liquid Amies Medium + 1 regular FLOQSwabs® with molded breaking point 	500 pieces 10 vipaks of 50 pieces	Nose, throat,vagina, rectum and wound
SDW01123	Screw-cap tube filled with 1 ml of Liquid Amies Medium + 1 flexible FLOQSwabs® with molded breaking point 	500 pieces 10 vipaks of 50 pieces	Nasopharynx and pediatric
SDW01124	Screw-cap tube filled with 1 ml of Liquid Amies Medium + 1 ultra-thin minitip FLOQSwabs® with molded breaking point 	500 pieces 10 vipaks of 50 pieces	Urogenital tract
SDW01121	Screw-cap tube filled with 1 ml of Liquid Amies Medium + 2 regular FLOQSwabs® with molded breaking point 	500 pieces 10 vipaks of 50 pieces	MRSA sample collection (nose, throat, perineum)
SDW01122	Screw-cap tube filled with 1 ml of Liquid Amies Medium + 3 regular FLOQSwabs® with molded breaking point 	500 pieces 10 vipaks of 50 pieces	MRSA sample collection (nose, throat, perineum)

Ordering information FecalSwab®

Cat N.	Description	Pack size	Sample*
SDW01126	FecalSwab® for manual use, 12x80mm tube filled with 2 ml Modified Cary Blair medium + 1 regular FLOQSwabs® 	500 pieces 10 vipaks of 50 pieces	Stool container, rectal

Ordering information UTM®

Cat N.	Description	Pack size	Sample*
SDW01126	12x80mm tube filled with 1ml UTM® medium + 1 regular FLOQSwabs® with molded breaking point 	300 pieces (6 boxes of 50 kits)	Nose, throat, vagina, rectum, faeces and wounds
SDW0330C	16x100mm tube filled with 3ml UTM® medium + 1 flexible minitip FLOQSwabs® with molded breaking point 	500 pieces 10 vipaks of 50 pieces	Eye, ear, nasal passages, nasopharynx, throat, urogenital tracts and pediatric sites
SDW0355C	12x80mm tube filled with 3ml UTM® medium + 1 regular FLOQSwabs® with molded breaking point 	300 pieces (6 boxes of 50 kits)	Nose, throat, vagina, rectum, faeces and wounds

Ordering information LBM® Broth

Cat N.	Description	Pack size	Sample*
SDW01145	**SELENITE Broth** 2ml in Screw Cap Tube in bulk 	300 pieces 6 boxes of 50 pieces	eSwab®, Fecalswab®

Ordering information eNat®

Cat. N.	Description	Pack size	Sample*
SDW608C	1ml eNAT® transport and preservation medium in 12x80mm screw cap tube 	300 pieces 6 boxes of 50 pieces	
SDW608C501M	1ml eNAT® transport and preservation medium in 12x80mm screw cap tube + 1 minitip FLOQSwabs® 	500 pieces 10 boxes of 50 pieces	nasal and urethral
SDW608C501P	1ml eNAT® transport and preservation medium in 12x80mm screw cap tube + 1 thin & flexible FLOQSwabs® 	500 pieces 10 boxes of 50 pieces	naso-pharyngeal
SDW608C501R	1ml eNAT® transport and preservation medium in 12x80mm screw cap tube + 1 regular FLOQSwabs® 	500 pieces 10 boxes of 50 pieces	nasal, throat, vaginal, groin, armpit, rectal, wound, buccal and faeces
SDW606C	2ml eNAT® transport and preservation medium in 12x80mm screw cap tube 	300 pieces 6 boxes of 50 pieces	
SDW606C501M	2ml eNAT® transport and preservation medium in 12x80mm screw cap tube + 1 minitip FLOQSwabs® 	500 pieces 10 boxes of 50 pieces	nasal and urethral
SDW606C501P	2ml eNAT® transport and preservation medium in 12x80mm screw cap tube + 1 thin & flexible FLOQSwabs® 	500 pieces 10 boxes of 50 pieces	naso-pharyngeal
SDW01152	2ml eNAT® transport and preservation medium in 12x80mm screw cap tube + 1 regular FLOQSwabs® 	500 pieces 10 boxes of 50 pieces	nasal, throat, vaginal, groin, armpit, rectal, wound, buccal and faeces

*Suggested table. Please refer to your GLP procedures to choose the most appropriate device for the specific sampling site

Scientific references

All the studies we cited in this product focus are listed here.

1. Leo S, Cherkaoui A, Renzi G, Schrenzel J. Mini Review: Clinical Routine Microbiology in the Era of Automation and Digital Health. Front Cell Infect Microbiol. 2020 Nov 30;10:582028.
2. M Blondeau J. Clinical microbiology laboratories and COVID-19: the calm before the storm. Future Microbiol. 2020 Oct;15(15):1419-1424.
3. C. Fontana, M. Favaro and C. Favalli, et al. How Liquid Based Microbiology Can Change the Workflow in the Microbiology Laboratories. Advances in Microbiology, Vol. 3 No. 6, 2013, pp. 504-510.
4. Zasada, A.A., Zacharczuk, K., Woźnica, K. et al. The influence of a swab type on the results of point-of-care tests. AMB Expr, 2020
5. Patrick Kiio Munywoki, Fauzat Hamid, Martin Mutunga, et al. Improved detection of respiratory viruses in pediatric outpatients with acute respiratory illness by Real-Time PCR using nasopharyngeal Flocked swabs. Journal of Clinical Microbiology, 2011.
6. Avika Misra, David J. Speicher, Kathy Luinstra, et al. Self-collected oral flocked swabs to measure prevalence of Epstein-Barr Virus antibodies and DNA amongst university students. Diagnostic Microbiology and Infectious Disease, 2021.
7. Tops SCM, Kolmus M, Wulms D, van Ingen J, Wertheim HFL, Kolwijck E. Recovery of aerobic gram-negative bacteria from the Copan Eswab transport system after long-term storage. Diagn Microbiol Infect Dis. 2020 Sep;98(1):115100.
8. Mattei V, Murugesan S, Al Hashmi M. Evaluation of Methods for the Extraction of Microbial DNA From Vaginal Swabs Used for Microbiome Studies. Front Cell Infect Microbiol. 2019 Jun 6;9:197.
9. Federman DG, Gupta S, Stack G, et al. SARS-CoV-2 detection in setting of viral swabs scarcity: Are MRSA swabs and viral swabs equivalent? PLoS One. 2020 Aug 5;15(8):e0237127.
10. Arena F, Di Pilato V, Vannetti F, et al. Population structure of KPC carbapenemase-producing Klebsiella pneumoniae in a long-term acute-care rehabilitation facility: identification of a new lineage of clonal group 101, associated with local hyperendemicity. Microb Genom. 2020 Jan;6(1):e000308.
11. Lecronier M, Tashk P, Tamzali Y, et al. Gut microbiota composition alterations are associated with the onset of diabetes in kidney transplant recipients. PLoS One. 2020 Jan 7;15(1):e0227373.
12. Bhavanam S, Freedman SB, Lee BE, et al. Differences in Illness Severity among Circulating Norovirus Genotypes in a Large Pediatric Cohort with Acute Gastroenteritis. Microorganisms. 2020 Nov 26;8(12):1873.
13. Richard-Greenblatt M, Rutherford C, Luinstra K, et al. Evaluation of the FecalSwab for Stool Specimen Storage and Molecular Detection of Enteropathogens on the BD Max System. J Clin Microbiol. 2020 Aug 24;58(9):e00178-20.
14. Bianco G, Boattini M, Barbui AM, et al. Evaluation of an antigen-based test for hospital point-of-care diagnosis of SARS-CoV-2 infection. J Clin Virol. 2021
15. Corman VM, Haage VC, Bleicker T, et al. Comparison of seven commercial SARS-CoV-2 rapid point-of-care antigen tests: a single-centre laboratory evaluation study. Lancet Microbe. 2021 Jul;2(7):e311-e319.
16. Carter S, Keogan B, O'Reilly P, et al. Detection of respiratory viruses in cystic fibrosis: comparison of nasal FLOQSwabs™ and sputum using the FilmArray® platform. J Cyst Fibros. 2019 Jun;18:S107.
17. Karissa Culbreath, Heather Piwonka, John Korver, et al. Benefits Derived from Full Laboratory Automation in Microbiology: a Tale of Four Laboratories. Journal of Clinical Microbiology, 2021
18. Cherkaoui, G. Renzi, N. Vuilleumier, et al. Copan WASPLab automation significantly reduces incubation times and allows earlier culture readings Clinical Microbiology and Infection, 2019.
19. Tyrrell KL, Citron DM, Leoncio ES, et al. Comparison of the Copan eSwab System with an Agar Swab Transport System for Maintenance of Fastidious Anaerobic Bacterium Viability. J Clin Microbiol. 2016 May;54(5):1364-7.

Copan
innovating together

This marketing material has been translated and issued by:

Don Whitley Scientific

Victoria Works, Victoria Street, Bingley, West Yorkshire, BD16 2NH
www.dwscientific.com

sales@dwscientific.co.uk
+44 (0)1274 595728

don whitley scientific
culturing innovation