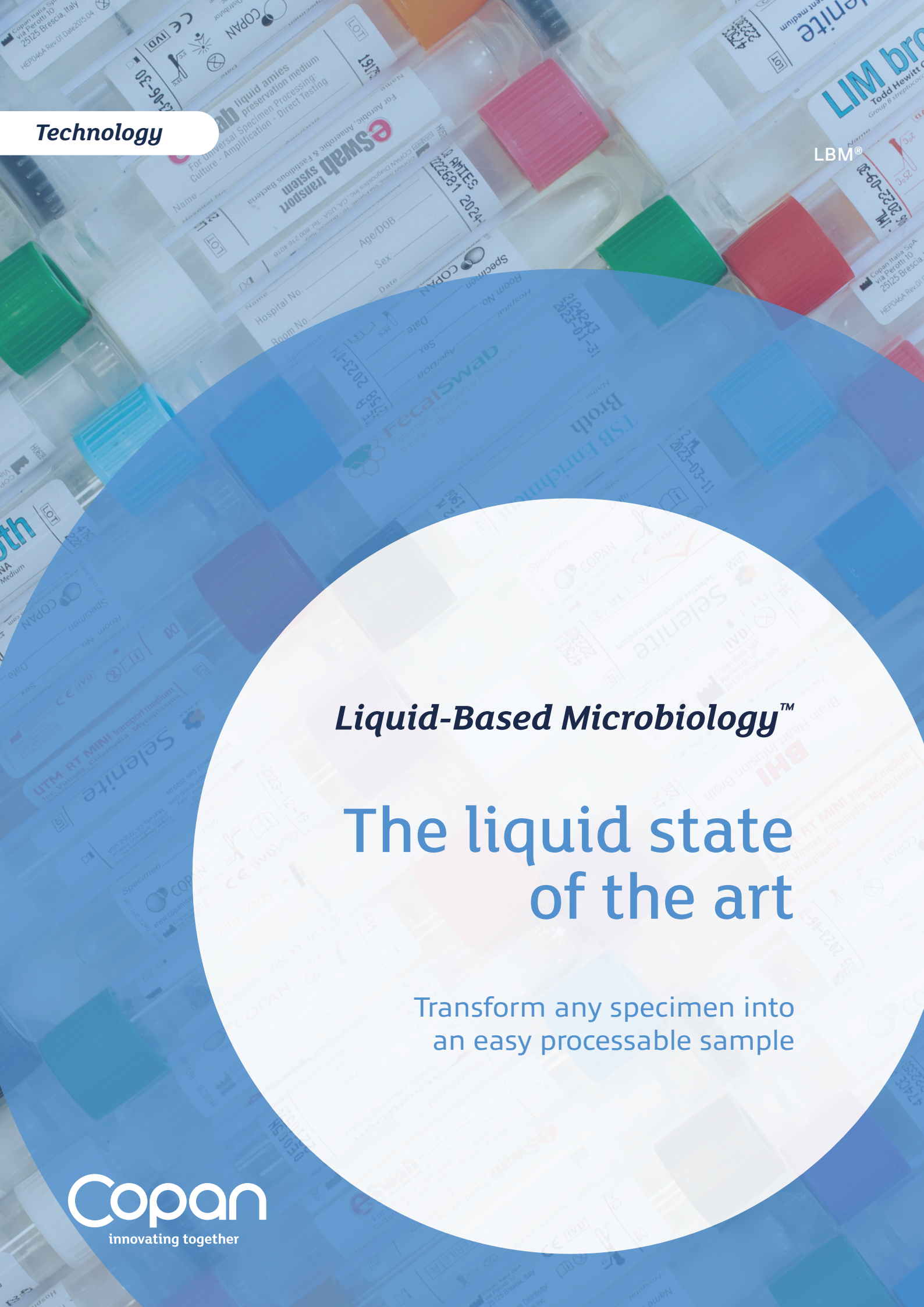


Technology

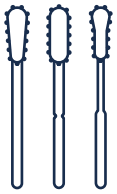
LBM®

*Liquid-Based Microbiology™*

# The liquid state of the art

Transform any specimen into an easy processable sample

Copan
innovating together



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 today the gold standard of microbiology specimen transport that transforms specimens into easy-to-process, automatable, and multi-purpose liquid samples.** Since the marketing of eSwab® back in 2006, many liquid media have been added to the LBM® family, so **there are almost no clinical microbiology specimens that cannot be collected, transported, or processed in a liquid medium.**

*Why Liquid-Based Microbiology?*

## Designed to meet modern labs' needs

Contemporary clinical microbiology laboratories face significant challenges, with demands to optimize their workflow and minimize 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 pace with these changes could have serious consequences. To support these labs in improving their workflow, we developed almost two decades ago the concept Liquid-Based Microbiology™ as an alternative to traditional gel media.

| GEL | | LBM |
|---|---|---|
| One sample – one test | | One sample – many test |
| 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 – often imitated but never matched – offers numerous advantages for microbiology labs seeking top 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 and 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 and bringing standardization to the next level.**

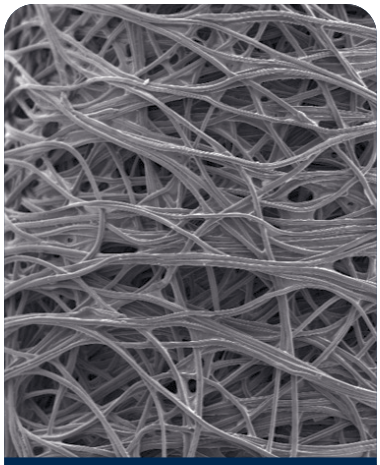
### Pros for everyone

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

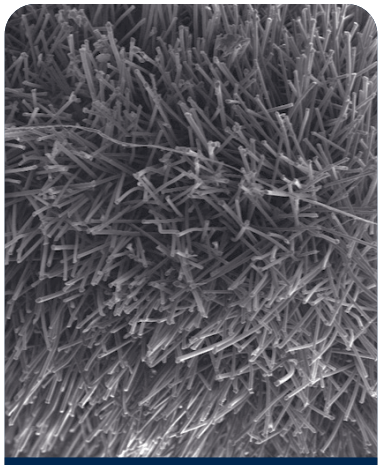
| | | |
|---|---|---|
| FOR THE **PATIENT** | More comfort thanks to the FLOQ technology | Avoids multisampling |
| Ergonomic, anatomic swab design and softer texture | Less invasive sample collection | No more unpleasant aluminum shafts for NP, urethral, ear, and eye collection |
| FOR THE **COLLECTION STAFF** | Only few collection devices | Improves standardization |
| Standardized 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** | Less product codes to manage | Less 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 customizable 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®

*EM photo courtesy of Santina Castriciano*

### *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-tolerated alternative to invasive and costly collection procedures in many anatomical sites.

## Multipurpose collection and transport media for traditional bacteriology culture

eSwab®

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® **stabilizes 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® stabilized 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*

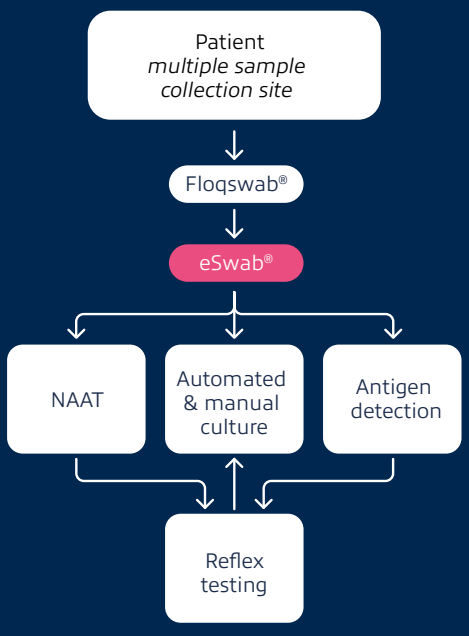
eSwab® is compatible with a broad range of downstream testing applications. Thanks to its liquid formulation, it can be used to run various tests from a single specimen, reducing the costs of multiple sampling and stocking. eSwab® is the only Amies-based transport media with an official claim for the 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 – striking results compared to the three scientific citations of the leading competitor.

### *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®

FecalSwab® is a modified Cary-Blair medium designed to stabilize 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® stabilizes 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*

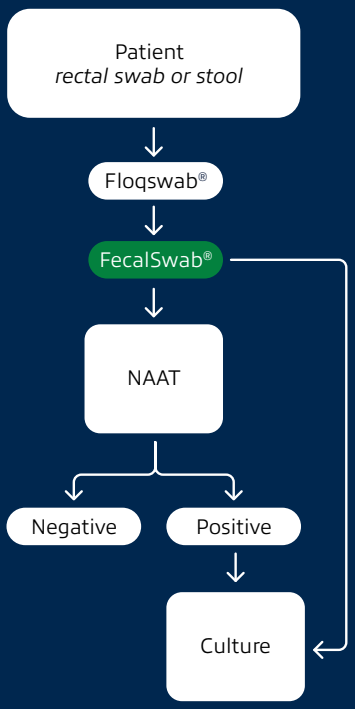
Fecalswab® can be used by medical staff to transfer a small amount of sample from the primary stool collection container or to collect a rectal swab sample directly.

### *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*

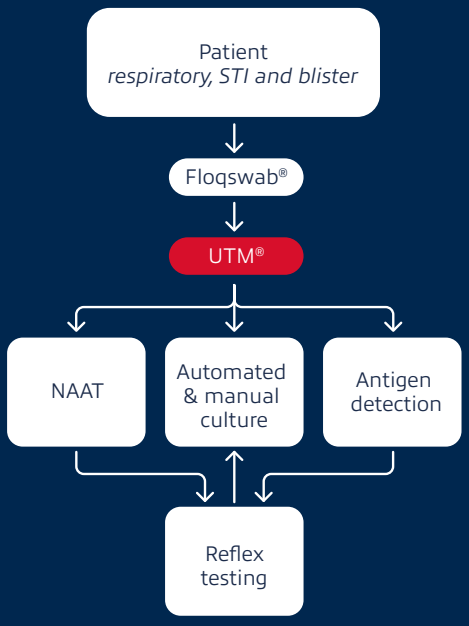
Three glass beads in each tube facilitate the release and dispersion of patient material and virus particles from the swab during vortexing.

### *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*

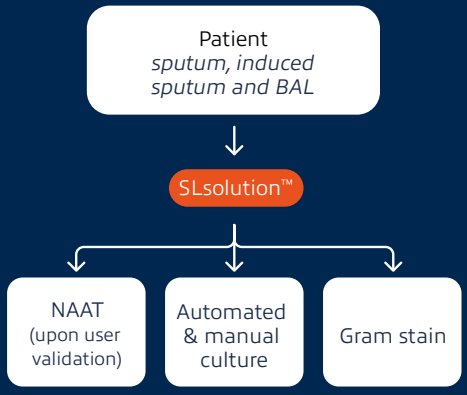
No need for rehydration of powder or dilution of liquid concentrate. SLSolution™ is ready to be mixed with your sample.

### *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.



## 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™*

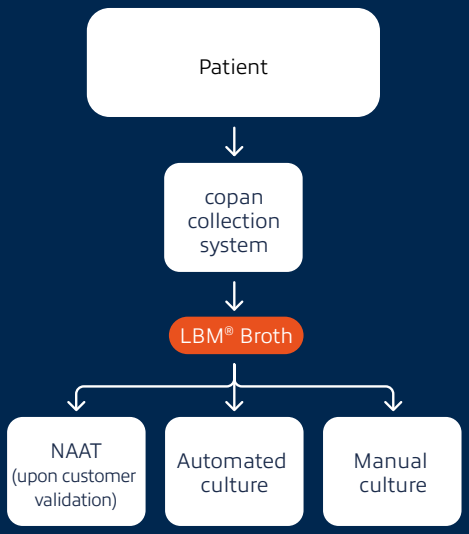
BHI broth™ is a medium specifically intended for fastidious bacteria, including *Streptococcus pneumoniae* and *Staphylococcus aureus*.

### *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.



*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 optimize the workflow in the laboratory, especially for 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 standardization 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 the microbiologists, in the next 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]

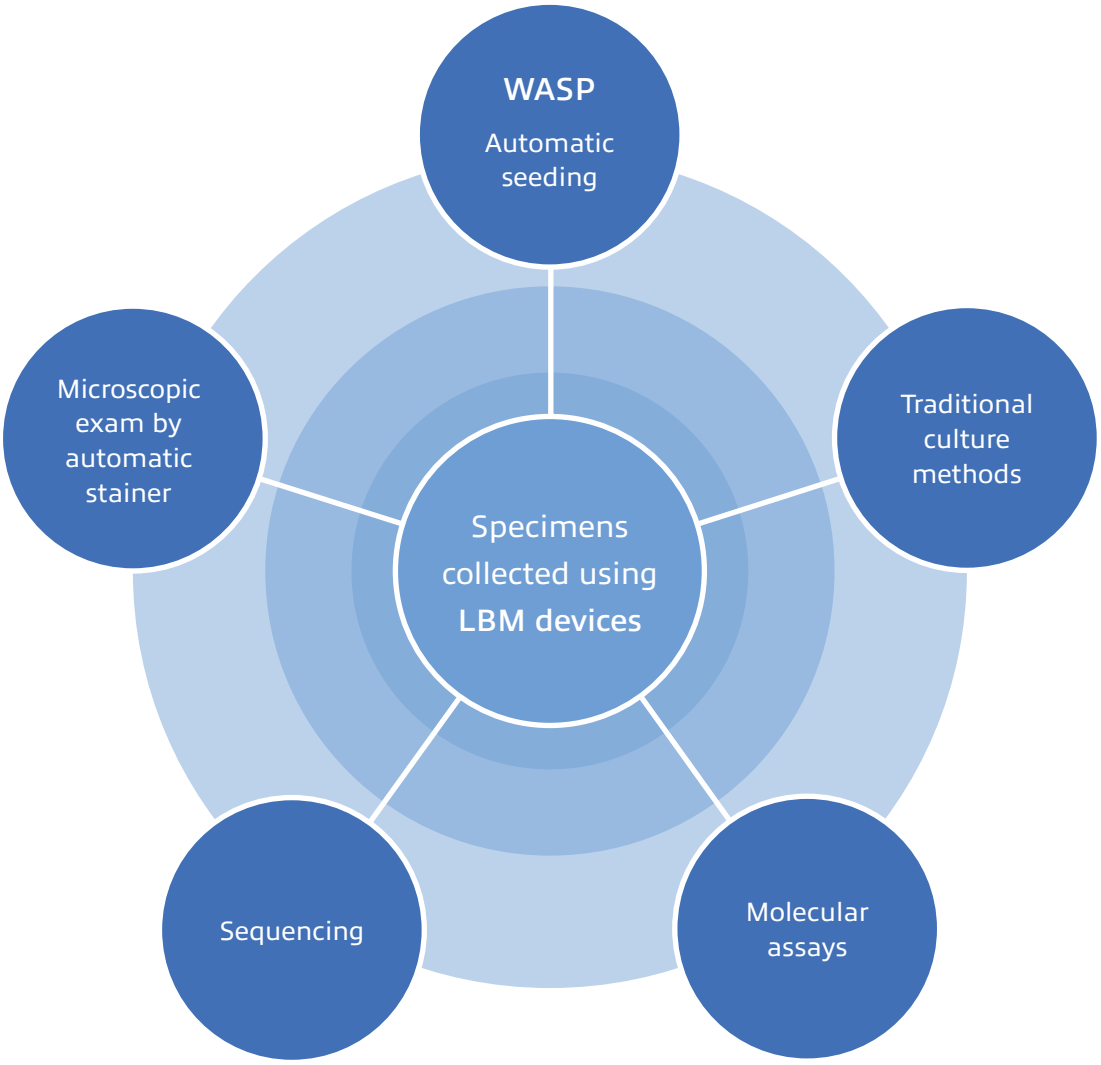
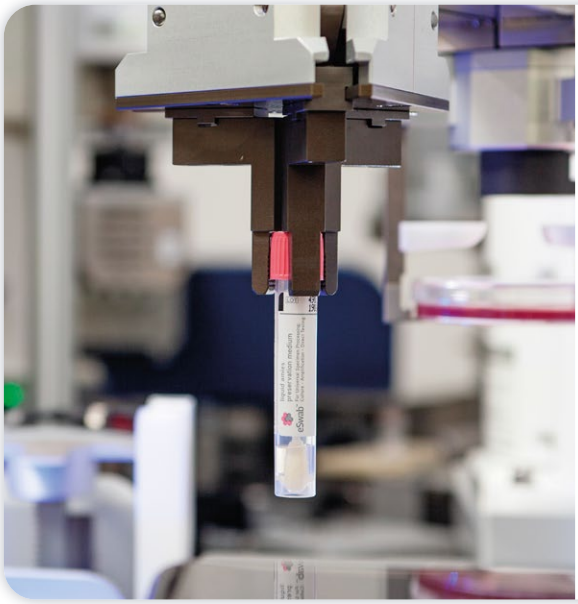



*Figure 1. Central role of LBM devices in a multidirectional and multi-tasking laboratory.*



*WASP®*

## Gone liquid? Go automated.

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

*Full Lab Automation*

## And it's just the beginning!

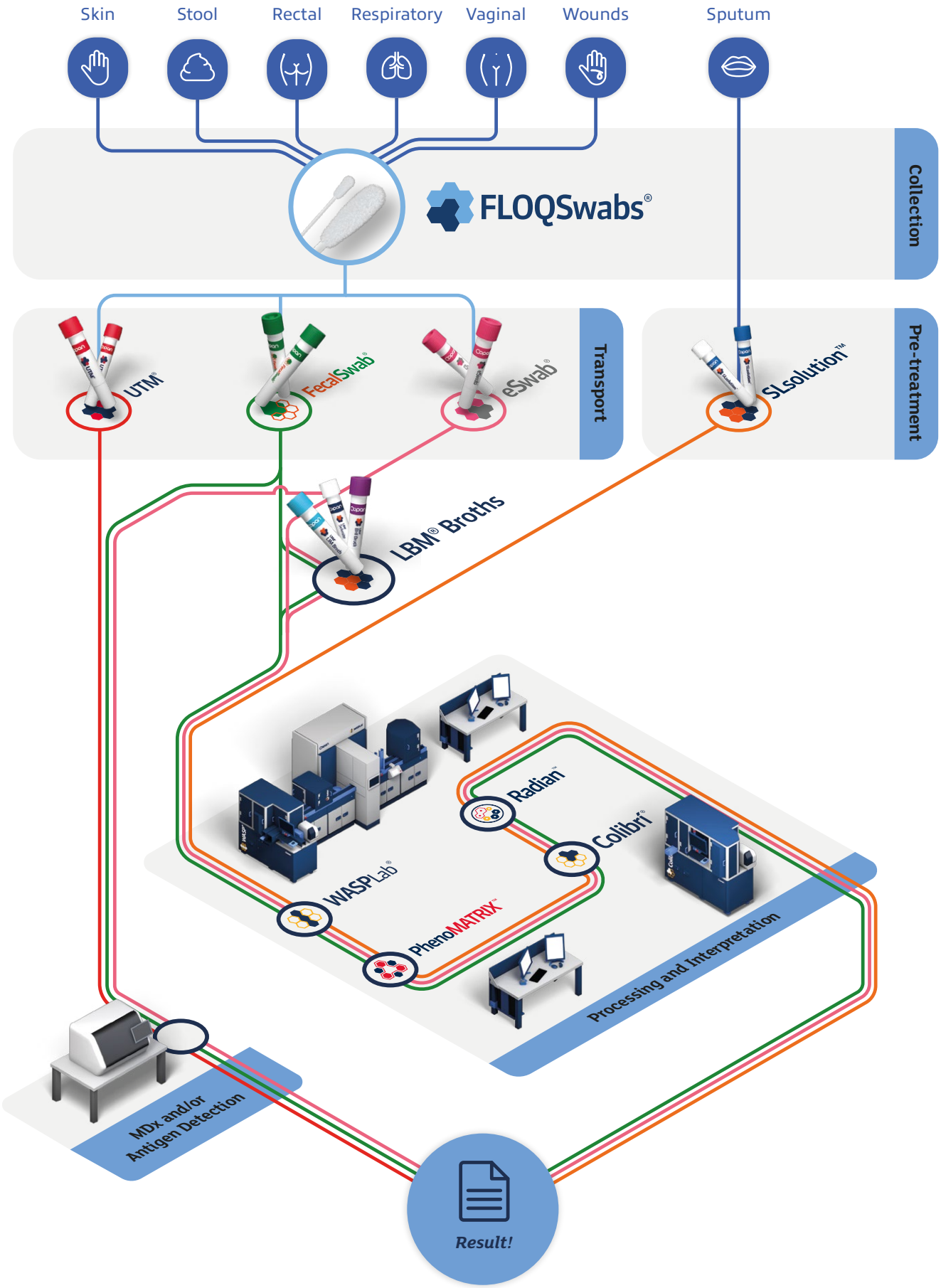
WASP® is just your first step into microbiology automation. Copan's WASPLab® preanalytical Full Lab Automation ecosystem begins at the streaking phase and – combining hardware modules with integrated image analysis software and Artificial Intelligence – takes care of reading, interpreting, and picking 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 customization 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* |
|---|---|---|---|
| 480CE | Screw-cap tube filled with 1 ml of Liquid Amies Medium + 1 regular FLOQSwabs® with molded breaking point  | 400 pieces<br>8 vipaks of 50 pieces | Nose, throat,vagina, rectum and wound |
| 481CE | Screw-cap tube filled with 1 ml of Liquid Amies Medium + 1 minitip FLOQSwabs® with molded breaking point  | 400 pieces<br>8 vipaks of 50 pieces | Eye, ear,throat, nasal passages and urogenital tracts |
| 482CE | Screw-cap tube filled with 1 ml of Liquid Amies Medium + 1 flexible FLOQSwabs® with molded breaking point  | 400 pieces<br>8 vipaks of 50 pieces | Nasopharynx and pediatric |
| 483CE | Screw-cap tube filled with 1 ml of Liquid Amies Medium + 1 ultra-thin minitip FLOQSwabs® with molded breaking point  | 400 pieces<br>8 vipaks of 50 pieces | Urogenital tract |
| 484CE | Screw-cap tube filled with 1 ml of Liquid Amies Medium + 1 mini flexible FLOQSwabs® with molded breaking point  | 400 pieces<br>8 vipaks of 50 pieces | Pediatric |
| 492CE03 | Screw cap tube filled with 1 ml of Liquid Amies Medium + 1 white regular FLOQSwabs® + 1 purple ultra-thin minitip FLOQSwabs® + 1 light green flexible FLOQSwabs®  | 400 pieces<br>8 vipaks of 50 pieces | Refer to the additional Instruction for Use available with the product. |

| Cat N. | Description | Pack size | Sample* |
|---|---|---|---|
| 493CE02 | Screw-cap tube filled with 1 ml of Liquid Amies Medium + 2 regular FLOQSwabs® with molded breaking point  | 400 pieces<br>8 vipaks of 50 pieces | MRSA sample collection (nose, throat, perineum) |
| 493CE03 | Screw-cap tube filled with 1 ml of Liquid Amies Medium + 3 regular FLOQSwabs® with molded breaking point  | 400 pieces<br>8 vipaks of 50 pieces | MRSA sample collection (nose, throat, perineum) |

## Ordering information FecalSwab®

| Cat N. | Description | Pack size | Sample* |
|---|---|---|---|
| 470CE | FecalSwab® for manual use, 12x80mm tube filled with 2 ml Modified Cary Blair medium + 1 regular FLOQSwabs®  | 500 pieces<br>10 vipaks of 50 pieces | Stool container, rectal |
| 4E048S | FecalSwab® for manual use, 12x80 mm tube filled with 2 ml of Modified Cary Blair medium + 1 regular FLOQSwabs® with stopper  | 500 pieces<br>10 vipaks of 50 pieces | Stool container, rectal |
| 4U031S | 12x80mm tube filled with 2 ml Modified Cary Blair medium + regual FLOQSwabs®  | 300 pieces<br>6 boxes with 50 tubes + 1 resealable pack of 50 stool transfer devices | Stool container |

## Ordering information UTM®

| Cat N. | Description | Pack size | Sample* |
|---|---|---|---|
| 305C | 16x100mm tube filled with 3ml UTM® medium + 1 flexible minitip FLOQSwabs® with molded breaking point  | 500 pieces<br>10 vipaks of 50 pieces | Eye, ear, nasal passages, nasopharynx, throat, urogenital tracts and pediatric sites |
| 307C | 16x100mm tube filled with 3ml UTM® medium + 1 minitip FLOQSwabs® with molded breaking point  | 300 pieces<br>(6 boxes of 50 kits) | Eye, ear, nasal passages, nasopharynx, throat, urogenital tracts and pediatric sites |
| 359C | 12x80mm tube filled with 1ml UTM® medium + 1 regular FLOQSwabs® with molded breaking point  | 300 pieces<br>(6 boxes of 50 kits) | Nose, throat, vagina, rectum, faeces and wounds |
| 360C | 12x80mm tube filled with 1ml UTM® medium + 1 flexible minitip FLOQSwabs® with molded breaking point  | 300 pieces<br>(6 boxes of 50 kits) | Eye, ear, nasal passages, nasopharynx, throat, urogenital tracts and pediatric sites |
| 330C | 16x100mm tube filled with 3ml UTM® medium + 1 flexible minitip FLOQSwabs® with molded breaking point  | 500 pieces<br>10 vipaks of 50 pieces | Eye, ear, nasal passages, nasopharynx, throat, urogenital tracts and pediatric sites |
| 350C | 16x100mm tube filled with 3ml UTM® medium + 1 minitip FLOQSwabs® with molded breaking point  | 300 pieces<br>(6 boxes of 50 kits) | Eye, ear, nasal passages, nasopharynx, throat, urogenital tracts and pediatric sites |
| 3U090N | 15.5x95 mm round bottom tube filled with 3ml UTM® medium – no bead  | 300 pieces<br>(6 boxes of 50 pieces) | N/A |
| 3U091N01 | 15.5x95 mm round bottom tube filled with 3ml UTM® medium – no beads + 1 regular FLOQSwabs®  | 300 pieces<br>(6 boxes of 50 pieces) | Nose, oropharynx, skin, vagina, rectum |
| 3U092N01 | 15.5x95 mm round bottom tube filled with 3ml UTM® medium – no beads + 1 progressive minitip FLOQSwabs®  | 300 pieces<br>(6 boxes of 50 pieces) | Nasopharingx, eye, hear |

## Ordering information SLSolution™

| Cat N. | Description | Pack size | Sample* |
|---|---|---|---|
| 0E003N | SLSolution™ kit: 1ml of DTT in liquid phase, in PET tube + 1 sterile Pasteur pipet for sputum sample transfer   | 300 pieces (6 boxes of 50 kits) | Respiratory samples |
| 0E005N | SLSolution™: 1ml of DTT in liquid phase, in PET tube in bulk   | 300 pieces (6 boxes of 50 kits) | Respiratory samples |

## Ordering information LBM® Broth

| Cat N. | Description | Pack size | Sample* |
|---|---|---|---|
| 474CE.A | **BHI Broth** 3ml in Screw Cap Tube in bulk   | 300 pieces 6 boxes of 50 pieces | eSwab®, liquid sample, swab sample |
| 4U002N | **THIOL Broth** 4ml in PET Tube in bulk  | 300 pieces 6 boxes of 50 pieces | eSwab®, liquid sample, colture colony |
| 477CE.A | **TSB Broth** plus 2.5% NaCl, 2ml in Screw Cap Tube in bulk   | 300 pieces 6 boxes of 50 pieces | eSwab®, liquid sample, swab sample |
| 475CE.A | **SELENITE Broth** 2ml in Screw Cap Tube in bulk   | 300 pieces 6 boxes of 50 pieces | eSwab®, Fecalswab® |
| 476CE.A | **LIM Broth** 2ml in Screw Cap Tube   | 300 pieces 6 boxes of 50 pieces | eSwab® |

*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.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