iFyber®

ANAEROBIC & ANTIMICROBIAL TESTING SOLUTIONS

Accelerating Product Development with Physiologically Relevant Microbiology Models

iFyber offers a fully integrated anaerobic testing platform that combines the Whitley A25 Anaerobic Workstation, the GasPak System, and controlled CO_2 incubation systems to support robust, scalable, and physiologically relevant microbiology studies.

Why It Matters

Many clinically relevant microorganisms thrive in **low-oxygen or oxygen-free environments.** Traditional approaches (e.g., anaerobic jars alone) can introduce variability and limit experimental design.

Our platform enables **precise environmental control**, supporting:

- Reproducible antimicrobial efficacy data
- Complex polymicrobial and biofilm models
- Improved translation to real-world conditions

THREE COMPLEMENTARY ANAEROBIC SYSTEMS

ANAEROBIC CHAMBER (WHITNEY A25)

- Continuous, Oxygen-Free Workspace for High-Control Studies
- Fully controlled O_2-free environment with real-time monitoring (O_2, CO_2, humidity)
- Airlock system enables sample transfer without oxygen exposure
- Supports:
  - Strict anaerobes (*Porphyromonas, Fusobacterium, Clostridium*)
  - Long-term culture and biofilm maturation
  - Time-course and mechanistic studies
  - Key Advantage: Eliminates oxygen fluctuations → more accurate growth kinetics and antimicrobial response

GASPAK SYSTEMS

- Flexible, Scalable Anaerobic Incubation
- Rapid oxygen removal in sealed systems
- Ideal for:
  - Can be used in combination with the anaerobic chamber or the biosafety cabinet to work with aerotolerant or obligate anaerobic bacteria.
  - Flexible format for a variety of tests.

CO_2 INCUBATORS (5–10% CO_2)

- Controlled Microaerophilic / Capnophilic Conditions
- Supports organisms requiring elevated CO_2: such as *Streptococcus mutans, S. agalactiae*
- Enables:
  - Host–microbe interaction models
  - Cell culture + infection systems
  - Key Benefit: → Bridges microbiology and mammalian cell-based assays

TECHNOLOGY

An anaerobic chamber, such as the **Whitley A25 Anaerobic Workstation**, provides a continuously controlled, oxygen-free environment, enabling precise handling, sampling, and analysis of strict anaerobes without atmospheric disruption. This level of control is critical for generating reproducible, physiologically relevant data, particularly in biofilm, polymicrobial, and time-course studies where oxygen exposure can significantly alter microbial behavior and antimicrobial response. In contrast, systems like the **Mitsubishi GasPak System** are well-suited for short-term incubation and high-throughput screening but operate as closed, batch systems that can introduce variability during setup and handling. **CO2 incubators** are a great resource when working with microaerophilic microorganisms. Together, these techniques provide an alternative to evaluate the antimicrobial properties of novel formulations, materials and devices.

WHITLEY A25 ANAEROBIC WORKSTATION, MITSUBISHI GASPAK SYSTEM, AND CO_2 INCUBATOR

MICROBIAL CAPABILITIES

Clinically Relevant Library of microorganisms

- Obligate anaerobes: *Porphyromonas gingivalis, P. gulae, Fusobacterium nucleatum, Veillonella parvula, Clostridium sporogenes*
- Facultative anaerobes: *E. coli, Klebsiella spp., Enterococcus spp.* (incl. VRE), *Salmonella, Shigella, Citrobacter, Enterobacter*
- Oral/mucosal organisms: *Streptococcus mutans, S. oralis, S. pyogenes*
- We have the ability to source other microorganisms from clinical isolate banks and various vendors.

MODELING CAPABILITIES

- Polymicrobial/mixed culture systems
- Biofilm and planktonic models
- Variable inoculum (low vs. high bioburden)
- Oxygen gradient simulation (facultative + obligate combinations)

ANTIMICROBIAL TESTING PLATFORMS

- In Vitro
  - MIC / MBC (CLSI-aligned)
  - Biofilm assays:
    - Biomass (crystal violet)
    - Viability (CFU, metabolic assays)
  - Time-kill kinetics
  - Zone of inhibition
- Ex Vivo / Advanced Models
  - Tissue-based infection systems
  - Barrier function assays (e.g., transwell)
  - Application-relevant matrices:
    - Artificial saliva
    - Wound exudate simulants
- Application-relevant matrices:
  - Artificial saliva
  - Simulated wound fluid

POTENTIAL APPLICATIONS

- Oral Health & Dental Materials
  - Periodontal pathogens (*Porphyromonas, Fusobacterium*)
  - Biofilm formation and disruption
  - Saliva-based testing environments
- Gastrointestinal & Microbiome Models
  - Enteric pathogens + anaerobes
  - Mixed-culture systems simulating gut conditions
  - Antimicrobial performance in complex matrices
- Wound healing & Medical Device Testing
  - Polymicrobial biofilms (aerobic + anaerobic)
  - Chronic wound simulation
  - Device-associated infection models
- Urogenital & Mucosal Systems
  - Vaginal microbiology (*Mobiluncus, Streptococcus*)
  - Dysbiosis and antimicrobial evaluation
- Environmental & Water-Contact Applications
  - Waterborne organisms (*Vibrio cholerae*)
  - Surface and material testing under relevant conditions

STUDY DESIGN & CUSTOMIZATION

Tailored to:

- Product type (device, biologic, antimicrobial)
- Regulatory strategy and claims
- R&D objectives
- Simulation of real-world conditions:
  - Anaerobic niches (oral, GI, wound)
  - Relevant vehicles and matrices
- Integration with advanced analytics:
  - qPCR, sequencing
  - Histology & imaging

DATA OUTPUTS

- CFU/mL, CFU/g
- Log reduction values
- Biofilm biomass & viability
- Statistical analysis and visualization
- Interpretation aligned with regulatory and development milestones

iFyber's integrated anaerobic platform, combining continuous chamber control, scalable GasPak systems, and CO_2 incubation, enables antimicrobial testing under physiologically relevant conditions, delivering decision-ready data from early development through clinical translation.

FOR MORE INFORMATION ON IFYBER'S SERVICES:

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