



Compliance Confidence: Congenica Micro Life Pipe Platform

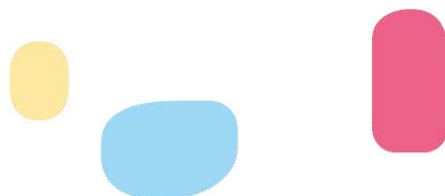


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Summary

Micro LifePipe is a cloud-based bioinformatics software service designed to support the analysis of next-generation sequencing (NGS) data in microbiology.

The service provides a single web-based application integrating microbiome, metagenomics and virology analyses, enabling users to process sequencing data, perform statistical analyses and generate interpretable results without manual file handling.

This document describes what Micro LifePipe is, how it is delivered, and how it supports laboratory, research and public sector use cases.

Scope of the Service

Micro LifePipe is intended for organisations requiring structured and reproducible analysis of NGS microbiology data, including public health bodies, research institutions, clinical research teams and industrial R&D groups.

The service focuses on **bioinformatics analysis** and does not include sequencing or wet-lab activities.

Service Description

Micro LifePipe is delivered as a **cloud-based software application**, accessible through a standard web browser.

It integrates multiple analysis capabilities within a single platform:

- Microbiome analysis based on amplicon sequencing (16S, Full 16S and ITS)
- Metagenomics shotgun analysis for broad microbial detection and functional analysis
- Virology analysis including viral genome reconstruction and variant analysis

The platform allows users to run bioinformatics and statistical analyses within the same application and to generate figures and tables directly usable in reports and presentations.

Key Functional Capabilities

Micro LifePipe provides the following core capabilities:

- Import of sequencing data in standard FASTQ format
- Automated and reproducible bioinformatics pipelines
- Integrated statistical analysis modules
- Metadata management to support sample comparison
- Genome viewers for microbial and viral data
- Drug resistance and antimicrobial resistance analysis (where applicable)
- Generation of PDF reports and export of figures and tables
- Programmatic access to results through secure APIs

Key Features and Benefits

The key features and benefits of this application are summarised as follows:

Key features

1. Cloud-based modular suite integrating microbiome, metagenomics and virology analyses
2. Amplicon microbiome analysis with metadata-driven cohort comparison and interpretation
3. Shotgun metagenomics enabling broad microbial detection and functional profiling
4. Virology module supporting panels, consensus sequences and Nextstrain clade assignment
5. Drug resistance detection for viral and microbial pathogens
6. Interactive genome viewers for coverage, variants and annotations inspection
7. Integrated statistical tools for comparative and exploratory data analysis
8. Standardized reproducible pipelines from FASTQ files to interpretable results
9. Automated PDF reports and structured exports through secure APIs
10. Compatible with major sequencers and standard laboratory workflows

Key benefits

1. Single application combines bioinformatics and statistics without manual file handling
2. End-to-end workflows from raw data to interpretable results
3. Faster analysis through automated, standardized and reproducible pipelines
4. Improved cohort comparison using integrated metadata and statistics
5. Direct export of figures and tables for reports and presentations
6. Reduced errors by eliminating manual data transfers between tools
7. Clearer interpretation using genome viewers and resistance analysis tools
8. Seamless integration with laboratory systems via APIs and standard formats
9. Scales from small pilots to large studies without workflow changes
10. Expert onboarding and support ensure efficient adoption and sustained use

Customisation and Configuration

Micro LifePipe supports configurable settings to match project and organisational needs, including:

- Monitored species lists
- Project and sample metadata fields
- Quality control thresholds and alerting parameters
- Automated data import and export workflows

Customisation can be performed:

- Directly through the web interface by administrators
- Through professional services during onboarding or via support requests

End users may personalise views, filters and displayed data columns.

Module Descriptions

Microbiome LifePipe - Nanopore Full 16S - RUO

High-resolution bioinformatic analysis for full-length 16S rRNA sequencing data from Oxford Nanopore FASTQ files. By leveraging the complete gene sequence (~1500bp), this workflow achieves **species-level taxonomic assignment** for granular, precise assessment of microbial communities.

Capabilities:

- In-depth quality control metrics
- Advanced alpha and beta diversity analysis
- Dynamic visualizations (interactive heatmaps, sunburst graphs)
- Flexible reference database selection (Microbiome LifePipe, Silva, NCBI)
- Community State Type (CST) analysis
- Custom monitoring of significant organisms
- Exportable results, tables, and graphs

Microbiome LifePipe - Illumina 16S - RUO

Comprehensive bioinformatic analysis for targeted 16S rRNA sequencing data from Illumina paired-end FASTQ files. Offers reliable **genus-level taxonomic identification**, ideal for general microbiota profiling.

Capabilities:

- Robust quality control metrics
- Alpha and beta diversity analyses with interactive visualizations
- Flexible reference database selection (Microbiome LifePipe, Silva, NCBI)
- Community State Type (CST) analysis
- Customizable tracking of key taxa
- Exportable results, tables, and graphs

Meta LifePipe - Nanopore Shotgun - RUO

End-to-end bioinformatics solution for shotgun metagenomics using Oxford Nanopore long-read data. Enables in-depth analysis of the **full microbial ecosystem**, including bacteria, fungi, viruses, archaea, and host-derived genetic material.

Capabilities:

- Robust QC including removal of host DNA and rRNA reads
 - High-resolution taxonomic profiling across all domains (Bacteria, Archaea, Eukaryota, Fungi, Viruses)
 - Interactive Sankey and Sunburst plots for taxonomic distribution
 - Comparative and differential analysis across conditions/cohorts
- 

- Genome-level insights with alignment data and coverage summaries
- Integrated genome browser
- Standard and custom reference database support
- Configurable export formats

Meta LifePipe - Illumina Shotgun - RUO

End-to-end bioinformatics solution for shotgun metagenomics using Illumina short-read data. Enables comprehensive analysis of the **full microbial ecosystem** beyond bacterial detection.

Capabilities:

- Robust QC including removal of host DNA and rRNA reads
- High-resolution taxonomic profiling across all domains (Bacteria, Archaea, Eukaryota, Fungi, Viruses)
- Interactive Sankey and Sunburst plots for taxonomic distribution
- Comparative and differential analysis across conditions/cohorts
- Genome-level insights with alignment data and coverage summaries
- Integrated genome browser
- Standard and custom reference database support
- Configurable export formats

Viro LifePipe - Nanopore Target Sequencing - RUO

Rapid, real-time analysis for custom targeted viral sequencing with Oxford Nanopore technology. Optimized for protocols like **ARTIC or SISPA**, enabling full-length viral genome analysis.

Capabilities:

- Fast detection of mutations and emerging variants
 - Complex structural change identification
 - Lineage assignment via Nextclade
 - Detailed variant analysis including allele frequency
 - Contamination checks
 - Integrated genome viewer
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- Flexible, exportable reports for public health and research

Viro LifePipe - Illumina Target Sequencing - RUO

Specialized, high-throughput workflow for targeted viral genome sequencing. Compatible with leading targeted panels (e.g., **Illumina CovidSeq**, **Twist Respiratory Virus Panel**). Ideal for sensitive detection of viral variants and precise clade assignment.

Capabilities:

- Detailed quality metrics (Coverage at 1x, 10x, 20x)
- Robust contamination checks
- Nextclade lineage assignment
- Integrated alignment viewer
- Clear, actionable reports for epidemiological surveillance and clinical research

Monthly NGS Manager® License

Software solution for monitoring and managing next-generation sequencing platforms. Provides a **single interface** to track all steps of the sequencing process.

Capabilities:

- Centralized sequencing activity monitoring
- Automated sample sheet creation
- Multi-sequencer support
- Project management (up to 5 projects per sequencer)
- Visualization of all sequencing workflow steps
- Cloud or on-premise deployment options

NGS Manager® Installation - RUO

One-time professional installation service for NGS Manager®. Includes on-site or remote deployment, configuration for laboratory infrastructure, and initial setup of sequencer connections and project parameters

Service Delivery Model

Micro LifePipe is provided as a subscription-based cloud service.

The service includes:

- Secure hosting and maintenance of the application
- Regular platform updates and improvements
- Automated monitoring and recovery mechanisms

Planned maintenance is scheduled outside standard business hours, with advance notice provided.

Support and Onboarding

User support is provided during standard business hours (08:00–17:00 CET).

Automated monitoring and recovery systems operate continuously.

Professional services are available to support:

- Onboarding and training
- Advanced configuration
- Workflow automation and system integration

Technical Requirements and Constraints

To use Micro LifePipe, buyers should note the following:

- A stable internet connection is required
- Input data must be provided in standard FASTQ format
- File size limits apply depending on analysis type
- All Microbiome LifePipe, Meta LifePipe and Viro LifePipe modules are designated Research Use Only (RUO). These modules are not intended for use in clinical diagnosis or patient management decisions.

Security and Data Handling

Micro LifePipe is designed following standard industry practices for data security and access control.

Data access is role-based, and audit mechanisms support traceability of user actions and analyses.

