

NTHRYS

OPC PVT LTD

SECTION • MIC

Microbial & Bacterial Molecular Genetics

Hands-on wet-lab training in microbial molecular genetics — microbial culture and isolation, bacterial genetics and gene transfer, microbial genome engineering, identification and typing, functional and phenotypic microbiology, and applied and specialised methods.

06

CATEGORIES

30

PROTOCOLS

MIC

SECTION ID

2026

EDITION

Categories & Protocols

Section **MIC** spans 6 category streams and 30 bench protocols. Every protocol carries a unique code for enrolment, tracking and certification.

MIC-CU	Microbial Culture & Isolation Aseptic culture, isolation & growth quantification	05
MIC-GT	Bacterial Genetics & Gene Transfer Conjugation, transduction & transposon mutagenesis	05
MIC-GE	Microbial Genome Engineering Recombineering, allelic exchange & CRISPR	05
MIC-ID	Microbial Identification & Typing 16S, MLST, PFGE & MALDI-TOF identification	05
MIC-FN	Functional & Phenotypic Microbiology Susceptibility, biofilm & stress-response assays	05
MIC-AP	Applied & Specialised Microbiology Phage, consortia, quorum sensing & banking	05
TOTAL	All training protocols in section MIC	30

CODE FORMAT

MIC • **GE** • **01**

MIC section

GE category

01 protocol

01

■ CATEGORY · MIC-CU

Microbial Culture & Isolation

Aseptic culture, isolation & growth quantification

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

MIC-CU-01

Aseptic Microbial Culture

Sterile inoculation & handling.

MIC-CU-02

Pure-Culture Isolation & Streaking

Single-colony purification.

MIC-CU-03

Anaerobic Culture

Oxygen-free cultivation.

MIC-CU-04

Selective / Differential Media

Targeted-growth media.

MIC-CU-05

Growth Curve & Quantification

OD & CFU measurement.

02

CATEGORY • MIC-GT

Bacterial Genetics & Gene Transfer

Conjugation, transduction & transposon mutagenesis

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

MIC-GT-01

Conjugation

Plasmid transfer by contact.

MIC-GT-02

Transduction

Phage-mediated transfer.

MIC-GT-03

Natural Transformation

Competence-based uptake.

MIC-GT-04

Plasmid Curing &
Incompatibility

Plasmid-loss & compatibility.

MIC-GT-05

Transposon Mutagenesis

Random insertional mutagenesis.

03

■ CATEGORY · MIC-GE

Microbial Genome Engineering

Recombineering, allelic exchange & CRISPR

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

MIC-GE-01

**Lambda Red
Recombineering**

Linear-DNA recombination.

MIC-GE-02

**Allelic Exchange / Gene
Replacement**

Homology-based replacement.

MIC-GE-03

CRISPR in Bacteria

Cas-based editing / selection.

MIC-GE-04

Suicide-Vector Knockout

Integrative-vector deletion.

MIC-GE-05

Markerless Deletion

Scar-free gene removal.

04

■ CATEGORY · MIC-ID

Microbial Identification & Typing

16S, MLST, PFGE & MALDI-TOF identification

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

MIC-ID-01

16S rRNA Identification

Sequence-based ID.

MIC-ID-02

MLST (Multilocus Sequence Typing)

Allele-profile typing.

MIC-ID-03

PFGE Strain Typing

Macrorestriction fingerprinting.

MIC-ID-04

Ribotyping / rep-PCR

Repeat-based fingerprinting.

MIC-ID-05

MALDI-TOF Identification

Mass-spectral ID.



■ CATEGORY · MIC-FN

Functional & Phenotypic Microbiology

Susceptibility, biofilm & stress-response assays



PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

MIC-FN-01

Antibiotic Susceptibility Testing

MIC & resistance profiling.

MIC-FN-02

Reporter-Fusion Assays

Promoter-activity readouts.

MIC-FN-03

Biofilm Assays

Adhesion & biofilm quantitation.

MIC-FN-04

Phenotypic Microarray

Genome-wide phenotyping.

MIC-FN-05

Stress-Response Assays

Survival under stressors.



■ CATEGORY · MIC-AP

Applied & Specialised Microbiology

Phage, consortia, quorum sensing & banking



PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

MIC-AP-01

Bacteriophage Isolation & Propagation

Phage recovery & titring.

MIC-AP-02

Microbial Consortia / Community Work

Multi-species culture.

MIC-AP-03

Quorum-Sensing Assays

Cell-density signalling.

MIC-AP-04

Microbial Fermentation Genetics

Production-strain genetics.

MIC-AP-05

Culture Preservation & Strain Banking

Long-term strain storage.

Master microbial genetics

Every protocol in Section MIC is delivered as hands-on bench training — from pure-culture isolation and conjugation through recombineering, strain typing and phenotypic assays. Microbes are both the workhorses of molecular biology and rich genetic systems in their own right.

30 protocols

6 categories

MIC section

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