

NTHRYS

OPC PVT LTD

SECTION • CLO

Molecular Cloning & Recombinant DNA

Hands-on wet-lab training in building recombinant DNA — restriction digestion and mapping, ligation and conventional cloning, seamless assembly methods, rapid PCR-product cloning, screening and verification of recombinants, and plasmid engineering and maintenance.

06

CATEGORIES

30

PROTOCOLS

CLO

SECTION ID

2026

EDITION

Categories & Protocols

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

CLO-RE	Restriction Digestion & Mapping Single/double digests, mapping & cleanup	05
CLO-LG	Ligation & Conventional Cloning Sticky/blunt ligation & vector preparation	05
CLO-AS	Seamless & Assembly Cloning Gibson, Golden Gate, Gateway & multi-fragment	05
CLO-RP	Rapid PCR-Product Cloning TA, TOPO, blunt & ligation-independent cloning	05
CLO-SC	Screening & Verification of Recombinants Blue/white, colony PCR, restriction & sequencing	05
CLO-PE	Plasmid Engineering & Maintenance Subcloning, tags, marker swaps & strain stocks	05
TOTAL	All training protocols in section CLO	30

CODE FORMAT

CLO · **AS** · **01**

CLO section

AS category

01 protocol

01

■ CATEGORY · CLO-RE

Restriction Digestion & Mapping

Single/double digests, mapping & cleanup

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

CLO-RE-01

Single & Double Digestion

Enzyme cutting of DNA.

CLO-RE-02

Restriction Mapping

Site-position determination.

CLO-RE-03

Partial Digestion

Controlled incomplete cutting.

CLO-RE-04

**Buffer & Star-Activity
Control**

Optimal-activity conditions.

CLO-RE-05

**Digestion Cleanup &
Verification**

Post-cut purification & check.

02

CATEGORY · CLO-LG

Ligation & Conventional Cloning

Sticky/blunt ligation & vector preparation

05
PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

CLO-LG-01

Sticky-End Ligation

Cohesive-overhang joining.

CLO-LG-02

Blunt-End Ligation

Flush-end joining.

CLO-LG-03

Vector Dephosphorylation

Self-ligation suppression.

CLO-LG-04

Insert : Vector Ratio
Optimisation

Maximising correct ligation.

CLO-LG-05

Ligation Verification

Confirming joined product.



■ CATEGORY · CLO-AS

Seamless & Assembly Cloning

Gibson, Golden Gate, Gateway & multi-fragment



PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

CLO-AS-01

Gibson Assembly

Overlap-based seamless joining.

CLO-AS-02

Golden Gate Assembly

Type-IIS modular assembly.

CLO-AS-03

Gateway Recombination Cloning

Site-specific recombination.

CLO-AS-04

In-Fusion / SLIC Cloning

Homology-based assembly.

CLO-AS-05

Multi-Fragment Assembly

Combining many parts at once.

04

■ CATEGORY · CLO-RP

Rapid PCR-Product Cloning

TA, TOPO, blunt & ligation-independent cloning

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

CLO-RP-01

TA Cloning

A-overhang PCR-product cloning.

CLO-RP-02

TOPO Cloning

Topoisomerase-mediated cloning.

CLO-RP-03

Blunt PCR Cloning

Polished-end insertion.

CLO-RP-04

Ligation-Independent
Cloning (LIC)

Exonuclease-overhang cloning.

CLO-RP-05

A-Tailing & Polishing

Preparing PCR ends for cloning.



■ CATEGORY · CLO-SC

Screening & Verification of Recombinants

Blue/white, colony PCR, restriction & sequencing



CODE	TRAINING PROTOCOL	DESCRIPTION
CLO-SC-01	Blue / White Screening	α -complementation selection.
CLO-SC-02	Colony PCR Screening	Direct insert detection.
CLO-SC-03	Restriction Screening of Clones	Diagnostic-digest confirmation.
CLO-SC-04	Sequencing Confirmation	Insert-fidelity verification.
CLO-SC-05	Insert Orientation Check	Directionality determination.



■ CATEGORY · CLO-PE

Plasmid Engineering & Maintenance

Subcloning, tags, marker swaps & strain stocks



PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

CLO-PE-01

Subcloning Strategies

Moving inserts between vectors.

CLO-PE-02

Tag & Fusion Addition

Adding affinity / reporter tags.

CLO-PE-03

Promoter / Marker Swapping

Reconfiguring vector elements.

CLO-PE-04

Glycerol Stocks & Strain Maintenance

Long-term clone storage.

CLO-PE-05

Plasmid Map Design & Annotation

In silico construct planning.

Cut, join & clone DNA

Every protocol in Section CLO is delivered as hands-on bench training — from restriction and ligation through Gibson and Golden Gate assembly, recombinant screening and plasmid engineering. Cloning is where you assemble the exact construct every expression and editing experiment depends on.

30 protocols

6 categories

CLO section

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