

# NTHRYS

OPC PVT LTD

SECTION • EXP

# Gene Expression & Transcriptomics

Hands-on wet-lab training in measuring gene activity — RT-qPCR quantification, microarray analysis, RNA sequencing, reporter gene assays, specialised expression-profiling methods, and expression normalisation, validation and interpretation.

06

CATEGORIES

30

PROTOCOLS

EXP

SECTION ID

2026

EDITION

# Categories & Protocols

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

|        |                                                                                                       |           |
|--------|-------------------------------------------------------------------------------------------------------|-----------|
| EXP-QP | <b>RT-qPCR Expression Quantification</b><br>cDNA, reference genes & relative/absolute quant           | 05        |
| EXP-MA | <b>Microarray Analysis</b><br>Hybridization, scanning & differential detection                        | 05        |
| EXP-RS | <b>RNA Sequencing (RNA-seq)</b><br>Library prep, depletion, mapping & DE analysis                     | 05        |
| EXP-RG | <b>Reporter Gene Assays</b><br>Luciferase, fluorescent & promoter-activity assays                     | 05        |
| EXP-PR | <b>Profiling &amp; Specialised Methods</b><br>Differential display, SSH, NanoString & run-on          | 05        |
| EXP-NV | <b>Normalisation, Validation &amp; Interpretation</b><br>Reference validation, statistics & reporting | 05        |
| TOTAL  | <b>All training protocols in section EXP</b>                                                          | <b>30</b> |

## CODE FORMAT

**EXP** • **RS** • **01**

EXP section

RS category

01 protocol

01

■ CATEGORY · EXP-QP

# RT-qPCR Expression Quantification

cDNA, reference genes &amp; relative/absolute quant

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

EXP-QP-01

RNA-to-cDNA for Expression

Reverse-transcription setup.

EXP-QP-02

Reference Gene Selection

Stable normaliser choice.

EXP-QP-03

Relative Quantification  
( $\Delta\Delta Ct$ )

Fold-change measurement.

EXP-QP-04

Absolute Quantification

Standard-curve copy numbers.

EXP-QP-05

Primer Efficiency &  
Validation

Assay performance checks.

02

CATEGORY · EXP-MA

## Microarray Analysis

Hybridization, scanning &amp; differential detection

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

EXP-MA-01

**Expression Array  
Hybridization**

Target-to-array binding.

EXP-MA-02

**Sample Labelling for Arrays**

Fluorescent target prep.

EXP-MA-03

**Array Scanning & Feature  
Extraction**

Signal acquisition.

EXP-MA-04

**Normalisation & Quality  
Control**

Array data conditioning.

EXP-MA-05

**Differential Expression  
Detection**

Up/down-regulation calling.



■ CATEGORY · EXP-RS

## RNA Sequencing (RNA-seq)

Library prep, depletion, mapping & DE analysis



PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

EXP-RS-01

mRNA / Total RNA Library  
Prep

RNA-seq library construction.

EXP-RS-02

rRNA Depletion / poly(A)  
Selection

Transcript enrichment.

EXP-RS-03

Strand-Specific RNA-seq

Directional library prep.

EXP-RS-04

Read Mapping &  
Quantification

Alignment & counting.

EXP-RS-05

Differential Expression  
Analysis

Statistical DE testing.

04

■ CATEGORY · EXP-RG

## Reporter Gene Assays

Luciferase, fluorescent &amp; promoter-activity assays

05

PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

EXP-RG-01

**Luciferase Reporter Assay**

Bioluminescent readout.

EXP-RG-02

**Dual-Luciferase  
Normalisation**

Internal-control ratio.

EXP-RG-03

**GFP / Fluorescent Reporters**

Live-cell expression readout.

EXP-RG-04

**β-Galactosidase Assay**

Colorimetric reporter.

EXP-RG-05

**Promoter-Activity  
Measurement**

Regulatory-element testing.



■ CATEGORY · EXP-PR

## Profiling & Specialised Methods

Differential display, SSH, NanoString & run-on



| CODE      | TRAINING PROTOCOL                  | DESCRIPTION                         |
|-----------|------------------------------------|-------------------------------------|
| EXP-PR-01 | Differential Display               | Comparative band profiling.         |
| EXP-PR-02 | Subtractive Hybridization (SSH)    | Enriching differential transcripts. |
| EXP-PR-03 | NanoString nCounter                | Amplification-free counting.        |
| EXP-PR-04 | Nuclear Run-On Assay               | Transcription-rate measurement.     |
| EXP-PR-05 | Single-Molecule RNA Quantification | Per-molecule transcript counts.     |





■ CATEGORY · EXP-NV

## Normalisation, Validation & Interpretation

Reference validation, statistics & reporting



PROTOCOLS

CODE

TRAINING PROTOCOL

DESCRIPTION

EXP-NV-01

Reference / Housekeeping  
Validation

Normaliser stability testing.

EXP-NV-02

Cross-Platform Validation

Confirming hits across methods.

EXP-NV-03

Expression Data  
Normalisation

Bias & depth correction.

EXP-NV-04

Statistical Significance  
Testing

Multiple-testing control.

EXP-NV-05

Result Interpretation &  
Reporting

Biological-context analysis.



# Measure every transcript

Every protocol in Section EXP is delivered as hands-on bench training — from RT-qPCR and reporter assays through microarrays and RNA-seq to careful normalisation and validation. Expression analysis is how you turn a list of genes into a readout of what a cell is actually doing.

**30** protocols

**6** categories

**EXP** section

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