

ISO 16921-2:2026-03 (E)

Biotechnology - Gene delivery systems - Part 2: Quantification methods for viral vectors

Contents

Page

Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Concepts for viral vector titer.....	2
4.1 General viral vector concepts.....	2
4.2 Physical titer measurements.....	4
4.2.1 General physical titer concepts.....	4
4.2.2 Direct viral vector titer measurement.....	4
4.2.3 Indirect viral vector titer measurement.....	5
4.2.4 Physical titer assay matrix.....	7
4.3 Activity assays.....	8
4.3.1 General activity assay concepts.....	8
4.3.2 Assay for transduction.....	9
4.3.3 Assay for infectivity.....	10
5 Considerations for viral vector quantification.....	11
5.1 Selection of fit for purpose attribute.....	11
5.2 Consideration for selection of a fit for purpose assay.....	12
5.3 Sampling of viral vectors for titer.....	13
5.4 Preparation of samples for titer determination.....	13
5.4.1 General concepts for sample preparation.....	13
5.4.2 Environmental factors.....	13
5.4.3 Procedures.....	13
5.4.4 Operator.....	14
5.4.5 Quality and stability of reagents.....	14
5.5 Considerations for cell-based assays.....	14
5.5.1 General concepts for cell-based assays.....	14
5.5.2 Cell qualification.....	14
5.5.3 Controls.....	14
5.6 Performing a measurement.....	15
6 Qualification, validation, and verification.....	15
6.1 Instrument qualification.....	15
6.2 Method qualification.....	15
6.3 Method validation and verification.....	16
6.4 Reference materials.....	19
6.4.1 General concepts for reference materials.....	19
6.4.2 Certified reference materials.....	19
6.4.3 In-house reference materials.....	19
6.4.4 Viral vector-based reference materials.....	19
6.4.5 Bead-based reference materials.....	19
6.4.6 Uses of reference materials.....	19
7 Data processing, analysis, and reporting.....	19
7.1 Data processing and analysis.....	19
7.1.1 General.....	19

7.1.2	Image processing and analysis	20
7.1.3	Gating	20
7.1.4	Coincidence correction	20
7.2	Reporting	20
Annex A	(informative) Quantification methods of viral vector titer	21
Annex B	(informative) General methods for the quantification of viral vector titer	23
Annex C	(informative) Example workflow of lentivirus (LV) transducing titer determination method	28
Bibliography	31