

# ISO 24479:2024-10 (E)

## Biotechnology - Cellular morphological analysis - General requirements and considerations for cell morphometry to quantify cell morphological features

---

### Contents

Page

|   |    |
|---|----|
| Foreword  | v  |
| Introduction  | vi |
| 1 Scope   | 1  |
| 2 Normative references  | 1  |
| 3 Terms and definitions   | 1  |
| 4 Abbreviations   | 4  |
| 5 General Concept   | 5  |
| 5.1 Cell morphometry  | 5  |
| 5.2 Steps for cell morphometry  | 5  |
| 6 Target of interest (TOI)  | 5  |
| 7 Image capture   | 6  |
| 7.1 Microscopic observation method  | 6  |
| 7.1.1 General   | 6  |
| 7.1.2 Cell properties to be observed  | 7  |
| 7.1.3 Sample preparation  | 7  |
| 7.2 Microscope system and its settings  | 9  |
| 7.2.1 General   | 9  |
| 7.2.2 Light source  | 11 |
| 7.2.3 Objective lens and condenser lens   | 11 |
| 7.2.4 Components in optical path  | 11 |
| 7.2.5 Image capture device  | 12 |
| 7.2.6 Image data  | 12 |
| 7.2.7 Environmental conditions  | 12 |
| 7.2.8 Observing position  | 12 |
| 7.2.9 Image capturing conditions  | 13 |
| 7.3 Execution of image capture  | 13 |
| 7.3.1 Single image capture  | 13 |
| 7.3.2 Multiple image capture  | 13 |
| 8 Segmentation of the TOI   | 13 |
| 9 Quantification  | 14 |
| 9.1 General   | 14 |
| 9.2 Procedure to quantify morphological features of segmented object  | 14 |
| 10 Qualification of Measurement   | 14 |
| 11 Reporting  | 15 |
| 11.1 General  | 15 |
| 11.2 Reporting of sample properties and sample preparation  | 15 |
| 11.3 Reporting of the microscopic observation method  | 15 |
| 11.4 Reporting of the image data, image pre-processing, and image analysis for morphometric analysis          | 16 |
| 11.5 Reporting of the morphological features for morphometric analysis  | 17 |
| Annex A (informative) Check sheet regarding selection of contrast-enhancing techniques for optical microscopy | 18 |
| Annex B (informative) Check sheet regarding selection of microscope system                                    | 20 |

|   |           |
|---|-----------|
| <b>Annex C (informative) List of cell morphological descriptors, definitions and formulae for cell shape, size</b> .....        | <b>21</b> |
| <b>Annex D (informative) List of cell morphological descriptors, definitions and formulae for cell texture</b> .....            | <b>29</b> |
| <b>Annex E (informative) Points to consider when acquiring phase-contrast images of cells suitable for image analysis</b> ..... | <b>34</b> |
| <b>Bibliography</b> .....   | <b>43</b> |