Quality Control Report for Oligo-barcode Mapping Step

| Metric Name	Experimental Value	Reference Range	Risk Level
qualified_oligo_ratio	0.99	0.95 - 1.00	checked OK
ambigous_barcode_ratio	0.01	0.00 - 0.05	checked OK
mean_barcodes_counts	149.93	50.00 - 500.00	checked OK
cv_barcodes_counts	0.68	0.50 - 1.30	checked OK

Reference Explanation for Quality Control Results:

qualified_oligo_ratio: A low ratio indicates an issue with the ligation efficiency during library construction. Check the plasmid construction and emulsion PCR steps if risk values occur.

ambigous_barcode_ratio: The ratio of the same barcode being repeatedly linked to multiple oligos. A high ratio indicates insufficient barcode complexity or non-random ligation.

mean_barcodes_counts: The average number of different barcode types linked to each oligo. A low count can cause inaccurate quantification, while a high count may reduce oligo coverage in later steps. Adjust library complexity if risk values occur.

cv_barcodes_counts: CV(Coefficient of Variation) indicates the distribution of barcode counts. Risk values suggest issues with the efficiency or randomness of the ligation process. Check the barcode distribution plot for further analysis.
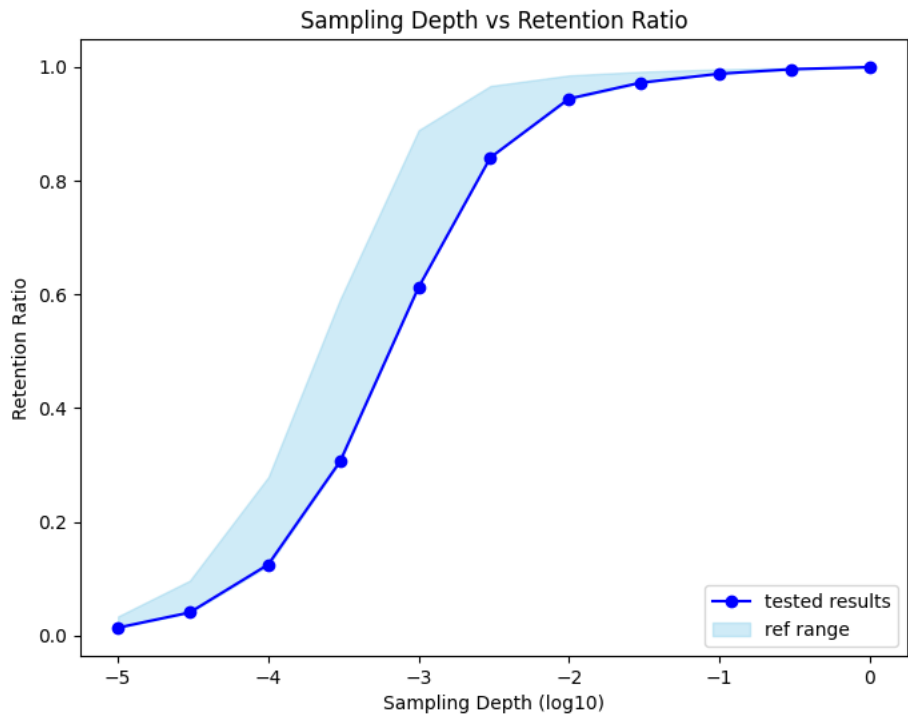
Coverage of oligos at different downsampling ratios for sequencing results: The closer the curve is to the upper left, the more sufficient the sequencing depth. If the test result is in the lower right of the reference range, consider increasing the sequencing depth.

Distribution of barcodes number linked to oligos for reference:

Reference Barcode Distribution

Test Barcode Distribution
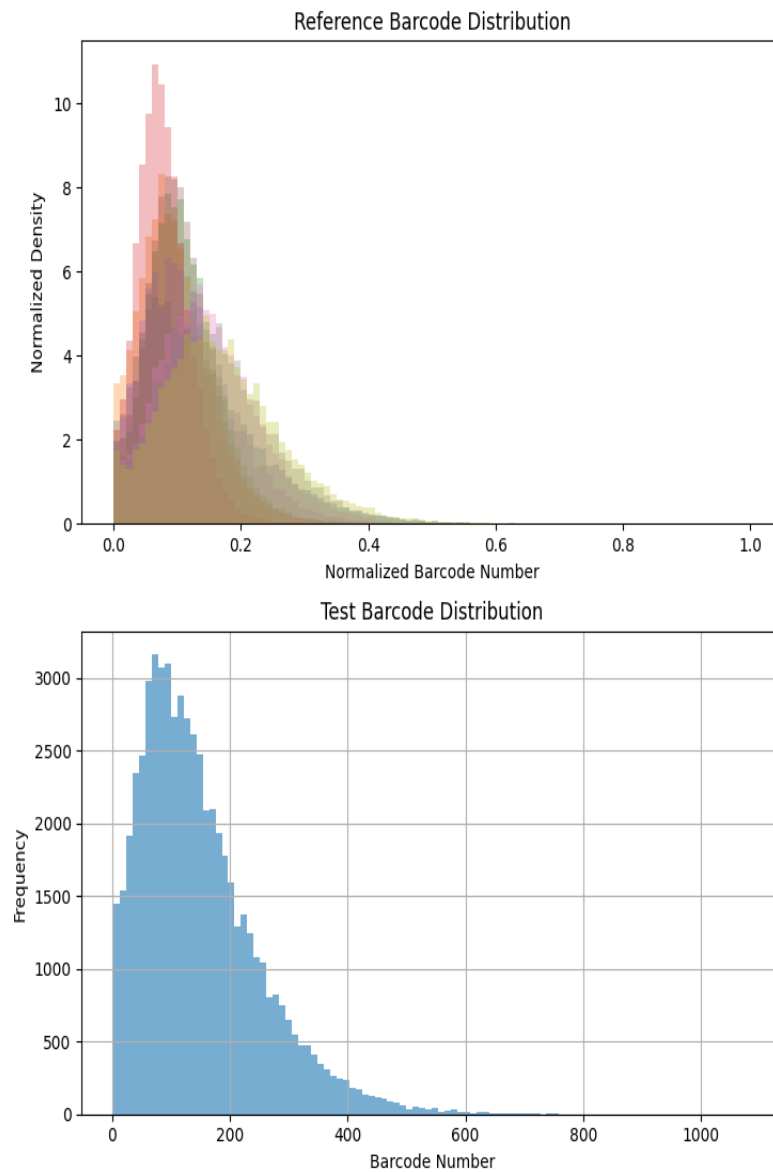
The distribution of the tested barcodes should resemble one of the reference distributions. If the long-tail effect is too pronounced, it is likely that the linking process between barcodes and oligos is not random, or that the emulsion PCR step has not effectively controlled the amplification efficiency of different sequences. When there is a significant discrepancy between this distribution and the reference distribution, it is recommended to check whether the linking step and the emulsion PCR step have been carried out smoothly.

Additional Quality Control Metrics

Metric Name	Experimental Value	Reference Range
all_seq_num	165117973.00	-
mapped_seq_num	84525373.00	-
mapped_seq_ratio	0.51	0.30 - 0.80
ambigous_barcode_num	99433.00	-
unique_barcode_num	8817926.00	-
qualified_oligo_num	58811.00	-
not_qualified_oligo_num	846.00	-
not_qualified_oligo_ratio	0.01	0.00 - 0.05
unique_barcode_num_qualified	8817515.00	-
mode_barcodes_counts	93.00	50.00 - 500.00

Reference for additional QC metrics:

all_seq_num: Total number of sequencing reads.

mapped_seq_num: Number of reads that meet the sequencing quality requirements and exactly match with the oligo library sequences.

mapped_seq_ratio: Ratio of reads that meet the sequencing quality requirements and exactly match with the oligo library sequences.

ambiguous_barcode_num: Number of barcodes that are ambiguously linked to multiple oligos.

unique_barcode_num: Number of barcode types that are uniquely linked to a single oligo.

qualified_oligo_num: Number of oligos that are linked to a sufficient amount (default value is 3) of barcodes.

not_qualified_oligo_num: Number of oligos that do not meet quality control requirements (due to insufficient types of linked barcodes).

not_qualified_oligo_ratio: Ratio of oligos that do not meet quality control requirements (due to insufficient types of linked barcodes).

unique_barcode_num_qualified: Number of available barcode types after removing not qualified oligos.

mode_barcodes_counts: The mode of the number of different barcode types linked to each oligo.