

Quartet Data Portal User Guide for RNA-Seq Quality Assessment Report

1. Preparation

| | |
|-------------|--|
| QDP Address | http://chinese-quartet.org/ |
| OSSUtil | https://docs.chinese-quartet.org/tools/ossutil/ |
| Input files | <p>The file name suffix should be: The data format that can be analysed online are pair-end FASTQ files, with suffixes of <code>_R1.fastq.gz</code> and <code>_R2.fastq.gz</code> or <code>_R1.fq.gz</code> and <code>_R2.fq.gz</code>. Your dataset must contain four groups D5, D6, F7 and M8, with at least 2 technical replicates in each group.</p> |

2. Log on to QDP

2.1 QDP account

1) If you have a request to receive reference materials, please go to <http://chinese-quartet.org/#/materials> to request the reference materials, and the Quartet team will contact you to send the reference materials and send you a link to register your account.

Reference Materials

Quartet multi-omics reference materials of DNA, RNA, proteins, and metabolites were simultaneously manufactured from the same batch of cultured immortalized B-lymphoblastoid cell line of a specific family member of a Chinese Quartet family from Fudan Taizhou Cohort, including father (F7), mother (M8), and two monozygotic twin daughters (D5 and D6). The Quartet Reference Materials suite is intended for quality control and performance assessment of each omics profiling. It can measure and mitigate technical variation, enabling more accurate data integration in large cohort studies. The Quartet multi-omics reference materials are publicly available and accessible. The recipients of the Reference Materials are highly encouraged to share their data with Fudan University through the Quartet Data Portal in order for us to improve the reference datasets and to better serve the community.

| Name of DNA Reference Material | Color |
|--------------------------------|-------|
| FDU_Quartet_DNA_D5_20171028 | ● |

| Name of RNA Reference Material | Color |
|--------------------------------|-------|
| FDU_Quartet_RNA_D5_20171028 | ● |

| Name of Protein Reference Material | Color |
|------------------------------------|-------|
| FDU_Quartet_Protein_D5_20171028 | ● |

| Name of Metabolite Reference Material | Color |
|---------------------------------------|-------|
| FDU_Quartet_Metabolite_D5_20171028 | ● |

2) If you do not have a request for reference materials, please send an email to quartet@fudan.edu.cn to request an account.

2.2 Log on to QDP

Address: <http://chinese-quartet.org/>

The Quartet Data Portal only supports access from modern browsers, such as Chrome, Safari, Firefox or Edge.

We're announcing the release of our new documentation service >>> <https://docs.chinese-quartet.org> <<<

The Quartet Project

Quality Control and Data Integration of Multi-omics Profiling

[Request Reference Materials](#) [Download MultiOmics Data](#) [Analyze Your Omics Data](#)

Multi-omics (or molecular phenomics) profiling at the genomic, transcriptomic, proteomic, and metabolomic levels is the cornerstone of high-throughput technologies for discovering biomarkers for precision medicine. However, the lack of quality control procedures of multi-omics profiling during data generation and data analysis can lead to false findings, raising serious concerns about the reliability of multi-omics studies.

The Quartet Project provides publicly accessible multi-omics reference materials and practical tools to enhance the reproducibility and reliability of multi-omics results. Well-characterized multiomics reference materials and quality control metrics pertinent to precision medicine study purposes can be used to measure and mitigate technical variation, enabling more accurate cross-batch and cross-omics data integration in increasingly large-scale and longitudinal studies such as the International Human Phenome Project.

| Data Portal Summary | | | |
|---------------------------------|-------|---------------------|--------------------|
| Release v1.0 (October 18, 2021) | | | |
| Cell Lines | Omics | Reference Materials | Reference Datasets |
| 4 | 6 | 20 | 16 |

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For the Quality Control of Omics Data

[Account Login](#)

Please enter your username.

Please enter your password.

[Register](#) [Forgot Password?](#)

[Login](#)

[Data Policies](#) [Help](#) [Feedback](#)

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2.3 Select Quality Assessment-QC Apps

The Quartet Data Portal only supports access from modern browsers, such as Chrome, Safari, Firefox or Edge.

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[chinese-quartet.org/sea-flow/app-store](https://docs.chinese-quartet.org/sea-flow/app-store)

3. Upload RNA sequencing data

3.1 Select Transcriptomics> Upload Your Data> Run

The screenshot shows the Quartet Quality Assessment interface. The 'Transcriptomics' tab is selected. Three main options are visible:

- Upload Your Data** (v0.2.1): Upload your data to the data repo, and then you can use it in the pipeline. A red box highlights the 'Run' button.
- RNA-Seq QC for Quartet** (v0.2.1): RNA Sequencing Quality Control Pipeline for Quartet. A red box highlights the 'Run' button.
- QC Report for Quartet RNA-Seq** (v0.2.2): Generate the QC Report for Quartet RNA-Seq data. A red box highlights the 'Run' button.

3.2 Click the symbol called “Register & Upload Your Data”

The screenshot shows the 'All Your Data' section of the Quartet Quality Assessment interface. A red box highlights the 'Register & Upload Your Data' button. Below the button is a table of data uploads:

| | Total | Started | Finished | Failed | |
|----------------------------------|-------|--|-----------------------------|------------------------------|-----------|
| Please enter the name of dataset | | | | | |
| practice genomics | | Uploading Path oss://quartet-data-portal/data/guoxr-22/practice/genomics/ | Started 2022-09-07 16:50 | Finished | New Token |
| speed_test1 genomics | | Uploading Path oss://quartet-data-portal/data/guoxr-22/speed_test1/genomics/ | Started 2022-09-02 10:19 | Finished 2022-09-06 15:02 | New Token |
| MGI_Quartet_test genomics | | Uploading Path oss://quartet-data-portal/data/guoxr-22/MGI_Quartet_test/genomics/ | Started 2022-08-11 22:51 | Finished 2022-09-02 10:20 | New Token |

3.3 Fill in Dataset Name, DataType select Transcriptomics, and click Submit

The screenshot shows the 'Register & Upload Your Omics Data' form in the Quartet portal. The form is partially filled out. The 'Dataset Name' field contains 'MG1_Quartet_test'. The 'Contact Email' field contains 'guoxr22@m.fudan.edu.cn'. The 'Manager' field contains 'guoxr-22'. The 'DataType' dropdown menu is set to 'Transcriptomics'. A 'Submit' button is highlighted with a red box. There is also a 'Cancel' button. A notice at the top states: 'The uploading path will automatically generate after you submit the form. If you want to access the same path as before, please enter the same information.'

3.4 Click the symbol called “New Token”. Copy the authorizedCode, which is for subsequent ossbrowser login

The screenshot shows the 'Quality Assessment' page in the Quartet portal. A 'New Token Information (Only Show Once)' dialog box is open, displaying a long alphanumeric string and a field labeled 'authorizedCode'. A 'New Token' button is highlighted with a red box. The dialog box also contains a 'Download' button and a close button. The background shows a table of datasets with 'New Token' and 'Check' buttons for each row.

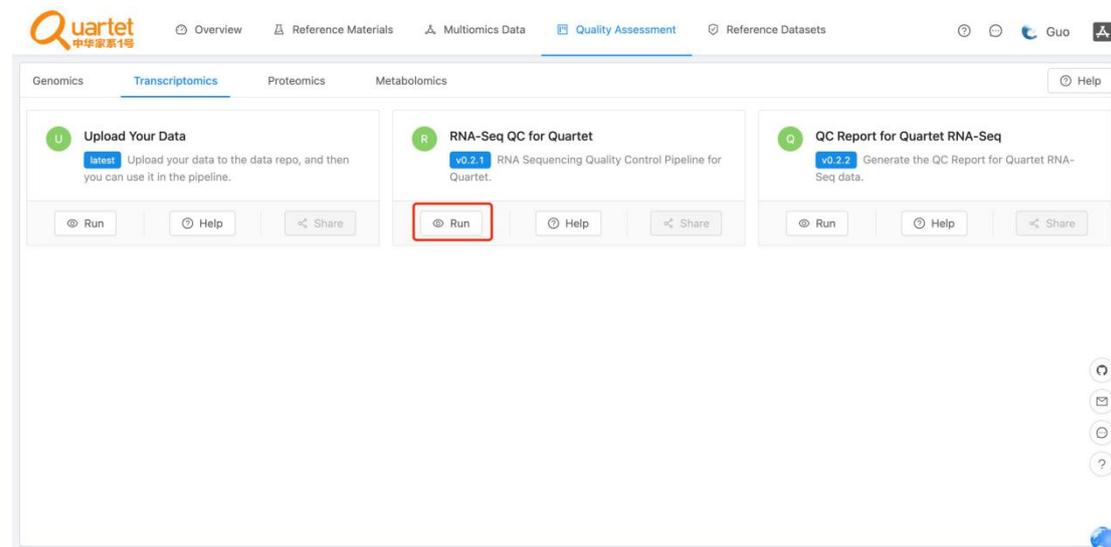
3.5 Please follow the ossutil document to upload your data

ossutil is a user friendly command line tool to upload data to the Quartet Data Portal. It supports the following operating systems: Windows, Linux, and macOS. You can download and install the ossutil version that best suits your requirements.

<https://docs.chinese-quartet.org/tools/ossutil/>

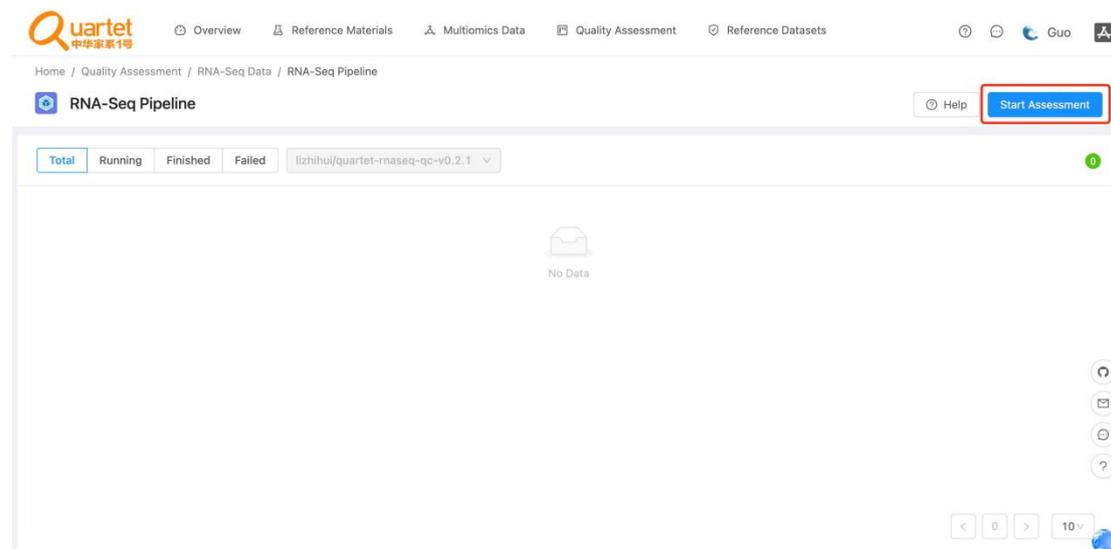
4. Run RNA-Seq app

4.1 Select Transcriptomics> RNA-Seq QC for Quartet> Run



The screenshot shows the Quartet web interface. The top navigation bar includes the Quartet logo and menu items: Overview, Reference Materials, Multiomics Data, Quality Assessment (selected), and Reference Datasets. Below the navigation bar, there are tabs for Genomics, Transcriptomics (selected), Proteomics, and Metabolomics. The main content area displays three app cards: 'Upload Your Data' (latest), 'RNA-Seq QC for Quartet' (v0.2.1), and 'QC Report for Quartet RNA-Seq' (v0.2.2). The 'Run' button for the 'RNA-Seq QC for Quartet' app is highlighted with a red box.

4.2 Click the symbol called “Start Assessment”



The screenshot shows the Quartet web interface for the 'RNA-Seq Pipeline'. The top navigation bar is the same as in the previous screenshot. Below the navigation bar, there is a breadcrumb trail: Home / Quality Assessment / RNA-Seq Data / RNA-Seq Pipeline. The main content area displays the 'RNA-Seq Pipeline' page. The 'Start Assessment' button is highlighted with a red box. Below the button, there are tabs for 'Total', 'Running', 'Finished', and 'Failed'. A dropdown menu shows the pipeline name: 'lizhihui/quartet-rnaseq-qc-v0.2.1'. The main content area is empty, displaying 'No Data' with a folder icon. The bottom right corner shows a pagination control with '< 0 >' and '10'.

4.3 Fill in Assessment Name and Description. Then click Next.

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Overview Reference Materials Multiomics Data Quality Assessment Reference Datasets

1 General Information 2 Assessment Parameters 3 Submit

* Assessment Name: MGI_Quartet_test_new

* Description: MGI_Quartet_test_new

* Started Time: 2022-10-14 11:04:37

* Group: Quartet Team

* Assessment App: lizhihui/quartet-maseq-qc-v0.2.1

Reset Next

4.4 Fill in Sample information

Sample ID Fill in the numbers; Select the read files and click upload. The parameters other than read file can be selected as default files or you can upload your own files. Assessment Parameters can be downloaded and checked.

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Overview Reference Materials Multiomics Data Quality Assessment Reference Datasets

General Information 2 Assessment Parameters 3 Submit

* Sample ID 1

* Read1 Files
+ Select Files
D5_S16_R1_001.fastq.gz

* Read2 Files
+ Select Files
D5_S16_R2_001.fastq.gz

* FastqScreen Conf File
+ Select Files
oss://pgx-reference-data/fastq_screen_reference/fastq_screen.conf

* References of Fastq Screen
+ Select Files
oss://pgx-reference-data/fastq_screen_reference/

* Index Directory
+ Select Files

4.5 Click the symbol called “Run Assessment”

The screenshot shows the 'Submit' step of a workflow. The 'Run Assessment' button is highlighted with a red box. Below the button is a table of assessment parameters.

| sample_id | read1 | read2 |
|--|---|---|
| 1 489eb0af-bdca-499e-996c-c1d6ea07e8ba | oss://quartet-data-portal/data/guoxr-22/MGI_Quartet_test/transcriptomics/DS_S16_R1_001.fastq.gz | oss://quartet-data-portal/data/guoxr-22/MGI_Quartet_test/transcri |

4.6 Check the status of Run Assessment

The screenshot shows the 'RNA-Seq Pipeline' status page. A red box highlights the status indicators for a completed assessment, showing 1 success, 0 running, 0 failed, and 0 pending.

| Sample ID | Status | Started | Finished |
|----------------------|------------|------------------|------------------|
| aaaaaaaaa | processing | 2022-10-14 18:40 | 0000-00-00 00:00 |
| MGI_Quartet_test_new | success | 2022-10-14 11:04 | 2022-10-14 19:50 |

5. Results and Report

5.1 Select Transcriptomics> QC Report for Quartet RNA Seq-Run

The screenshot shows the Quartet web interface with the 'Quality Assessment' tab selected. Three workflow steps are visible: 'Upload Your Data', 'RNA-Seq QC for Quartet', and 'QC Report for Quartet RNA-Seq'. The 'QC Report for Quartet RNA-Seq' step is highlighted with a red box around its 'Run' button. The interface includes a navigation bar with 'Overview', 'Reference Materials', 'Multiomics Data', 'Quality Assessment', and 'Reference Datasets'. The 'QC Report for Quartet RNA-Seq' step description reads: 'v0.2.2 Generate the QC Report for Quartet RNA-Seq data.'

5.2 Click the symbol called “New QC Report”

The screenshot shows the 'RNA-Seq QC Report' page in the Quartet web interface. A blue button labeled 'New QC Report' is highlighted with a red box. Below the button is a table with the following columns: Report Name, Category, Report Tool, Version, Created At, Finished At, Status, and Action. The table content is currently empty, displaying a 'No Data' message with a folder icon. The breadcrumb path is 'Home / Quality Assessment / RNA-Seq Data / RNA-Seq QC Report'. The navigation bar at the top includes 'Overview', 'Reference Materials', 'Multiomics Data', 'Quality Assessment', and 'Reference Datasets'.

| Report Name | Category | Report Tool | Version | Created At | Finished At | Status | Action |
|-------------|----------|-------------|---------|------------|-------------|--------|--------|
| No Data | | | | | | | |

5.3 Follow the Steps as prompted

