



CDISC Library for Dummies: Use of the API

CDISC DACH User Network Meeting / Sulzbach
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What is an API?

- API = Application Programming Interface
- A **contract** between different applications
 - often, one of the applications is a "server"
 - and the other applications are "clients"
(server - client architecture)
- The "contract" is machine-readable as well as human-readable and often machine-executable
- When used over the internet: **RESTful Web Services**

The CDISC Library API Documentation

- <https://www.cdisc.org/cdisc-library/api-documentation>

CDISC Library API Documentation

The CDISC Library API is REST-based and by default returns JSON content. The CDISC Library API documentation below describes how to request each API endpoint and what to expect as a response.

CDISC Library API ^{3.0} ^{OAS3}

https://www.cdisc.org/system/files/cdisc_library/api_documentation/cdisc-library-swagger-3.0.1.json

REST API documentation for CDISC Library in production server

[Contact CDISC Library Support](#)

[License for CDISC Members & Open Source Developers](#)

[Media Type Support Matrix](#)

Servers

<https://library.cdisc.org/api> - Production CDISC Library

Authorize

Statuses

GET /mdr/maintenance /mdr/maintenance

Searches

GET /mdr/suggest /mdr/suggest

GET /mdr/search /mdr/search

GET /mdr/search/scopes /mdr/search/scopes

GET /mdr/search/implementedBy /mdr/search/implementedBy

Study Data Tabulation Model (SDTM)

GET /mdr/sdtm/{version} /mdr/sdtm/{version}

GET /mdr/sdtm/{version}/classes /mdr/sdtm/{version}/classes

GET /mdr/sdtm/{version}/classes/{class} /mdr/sdtm/{version}/classes/{class}

GET /mdr/sdtm/{version}/classes/{class}/variables /mdr/sdtm/{version}/classes/{class}/variables

GET /mdr/sdtm/{version}/classes/{class}/variables/{var} /mdr/sdtm/{version}/classes/{class}/variables/{var}

GET /mdr/sdtm/{version}/classes/{class}/datasets /mdr/sdtm/{version}/classes/{class}/datasets

GET /mdr/sdtm/{version}/datasets /mdr/sdtm/{version}/datasets

GET /mdr/sdtm/{version}/datasets/{dataset} /mdr/sdtm/{version}/datasets/{dataset}

GET /mdr/sdtm/{version}/datasets/{dataset}/variables /mdr/sdtm/{version}/datasets/{dataset}/variables

GET /mdr/sdtm/{version}/datasets/{dataset}/variables/{var} /mdr/sdtm/{version}/datasets/{dataset}/variables/{var}

GET /mdr/root/sdtm/classes/{class}/variables/{var} /mdr/root/sdtm/classes/{class}/variables/{var}

GET /mdr/root/sdtm/datasets/{dataset}/variables/{var} /mdr/root/sdtm/datasets/{dataset}/variables/{var}

Some typical calls to the Library

- base: <https://library.cdisc.org/api>
- [/mdr/sdtmig/3-3/datasets/AE/variables/AESER](#)
provides all the information about the AESER variable from SDTMIG-3.3
- [/mdr/sdtm/1-7/classes/Findings](#)
provides all the information (or better: links to)
all information about the Findings variables in SDTM (model) 1.7

Try it out!

<https://library.cdisc.org/api/mdr/sdtmig/3-3/datasets/AE/variables/AESER>

```
{
  "_links": {
    "codelist": {
      "0": {
        "href": "/mdr/root/ct/sdtmct/codellists/C66742",
        "title": "Version-agnostic anchor resource for codelist C66742",
        "type": "Root Value Domain"
      }
    },
    "modelClassVariable": {
      "href": "/mdr/sdtm/1-7/classes/Events/variables/--SER",
      "title": "Serious Event",
      "type": "Class Variable"
    },
    "parentDataset": {
      "href": "/mdr/sdtmig/3-3/datasets/AE",
      "title": "Adverse Events",
      "type": "SDTM Dataset"
    },
    "parentProduct": {
      "href": "/mdr/sdtmig/3-3",
      "title": "Study Data Tabulation Model Implementation Guide: Human Clinical Trials Version 3.3 (Final)",
      "type": "Implementation Guide"
    },
    "priorVersion": {
      "href": "/mdr/sdtmig/3-2/datasets/AE/variables/AESER",
      "title": "Serious Event",
      "type": "SDTM Dataset Variable"
    },
    "rootItem": {
      "href": "/mdr/root/sdtmig/datasets/AE/variables/AESER",
      "title": "Version-agnostic anchor resource for SDTMIG variable AE.AESER",
      "type": "Root Data Element"
    },
    "self": {
      "href": "/mdr/sdtmig/3-3/datasets/AE/variables/AESER",
      "title": "Serious Event",
      "type": "SDTM Dataset Variable"
    }
  },
  "core": "Exp",
  "description": "Is this a serious event? Valid values are 'Y' and 'N'.",
  "label": "Serious Event",
  "name": "AESER",
  "ordinal": "27",
  "role": "Record Qualifier",
  "simpleDatatype": "Char"
}
```

Try it out!

<https://library.cdisc.org/api/mdr/sdtm/1-7/classes/Findings>

JSON Rohdaten Kopfzeilen

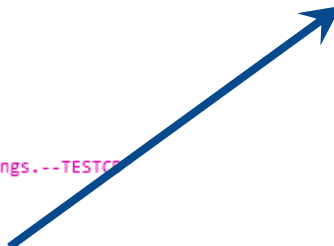
Speichern Kopieren Alle einklappen Alle ausklappen JSON durchsuchen

```

{
  "_links": {
    "parentClass": {},
    "parentProduct": {},
    "priorVersion": {},
    "self": {},
    "subclasses": []
  },
  "classVariables": {
    "0": {
      "_links": {
        "parentClass": {
          "href": "/mdr/sdtm/1-7/classes/Findings",
          "title": "Findings Observation Class",
          "type": "Class"
        },
        "parentProduct": {
          "href": "/mdr/sdtm/1-7",
          "title": "Study Data Tabulation Model Version 1.7",
          "type": "Foundational Model"
        },
        "priorVersion": {
          "href": "/mdr/sdtm/1-6/classes/Findings/variables/--TESTCD",
          "title": "Short Name of Measurement, Test or Examination",
          "type": "Class Variable"
        },
        "rootItem": {
          "href": "/mdr/root/sdtm/classes/Findings/variables/--TESTCD",
          "title": "Version-agnostic anchor resource for SDTM variable Findings.--TESTCD",
          "type": "Root Data Element"
        },
        "self": {
          "href": "/mdr/sdtm/1-7/classes/Findings/variables/--TESTCD",
          "title": "Short Name of Measurement, Test, or Exam",
          "type": "Class Variable"
        }
      },
      "description": "Short character value for --TEST used as a column name when converting a dataset from a vertical fo"
    }
  }
}

```

Link to details about
--TESTCD variable in SDTM 1.7



Linking things together

<https://library.cdisc.org/api/mdr/sdtmig/3-3/datasets/LB/variables/LBTESTCD>

```
{
  "_links": {
    "codelist": {
      "0": {
        "href": "/mdr/root/ct/sdtmct/codelists/C65047",
        "title": "Version-agnostic anchor resource for codelist C65047",
        "type": "Root Value Domain"
      }
    },
    "modelClassVariable": {
      "href": "/mdr/sdtm/1-7/classes/Findings/variables/--TESTCD",
      "title": "Short Name of Measurement, Test, or Exam",
      "type": "Class Variable"
    },
    "parentDataset": {
      "href": "/mdr/sdtmig/3-3/datasets/LB",
      "title": "Laboratory Test Results",
      "type": "SDTM Dataset"
    },
    "parentProduct": {
      "href": "/mdr/sdtmig/3-3",
      "title": "Study Data Tabulation Model Implementation Guide: Human Clinical Trials Version 3.3 (Final)",
      "type": "Implementation Guide"
    },
    "priorVersion": {
      "href": "/mdr/sdtmig/3-2/datasets/LB/variables/LBTESTCD",
      "title": "Lab Test or Examination Short Name",
      "type": "SDTM Dataset Variable"
    },
    "rootItem": {
      "href": "/mdr/root/sdtmig/datasets/LB/variables/LBTESTCD",
      "title": "Version-agnostic anchor resource for SDTMIG variable LB.LBTESTCD",
      "type": "Root Data Element"
    },
    "self": {
      "href": "/mdr/sdtmig/3-3/datasets/LB/variables/LBTESTCD",
      "title": "Lab Test or Examination Short Name.",
      "type": "SDTM Dataset Variable"
    },
    "core": "Req"
  }
}
```

The API uses the HATEOAS principle

Hypermedia as the Engine of Application State (HATEOAS) zu Deutsch: Hypermedia als Motor des Anwendungs-Zustands, ist eine Einschränkung der REST-Anwendungsarchitektur. Mit HATEOAS interagiert ein Client mit einer Netzwerkanwendung, deren Anwendungsserver Informationen dynamisch über Hypermedien bereitstellen.

Forget everything I showed you about using
the CDISC Library in the browser

APIs are there for application-application
communication, not for use in the browser

Implementing the CDISC Library API in software applications

- Every modern software language has libraries for use with APIs and RESTful Web Services
- Manuals and examples at:
<https://wiki.cdisc.org/display/LIBSUPRT/Getting+Started%3A+Programmatically+connect+to+CDISC+Library+API>

Seiten / CDISC Library Service Desk Knowledge Base / How-to articles

Getting Started: Programmatically connect to CDISC Library API

Angelegt von Anthony Chow, zuletzt geändert am Dez 06, 2022

① We will be adding code snippets in other languages.

2020-11-11: Updated to use API key authentication

2020-07-07: Added XQuery examples

2019: 10-07: Added an R example

2019-07-09: Added a Java example

2019-05-25: Added a SAS example

Tools for exploring the API and testing API requests

- Your browser
- [Postman](#)
[SoapUI](#)
[Insomnia](#)
- Your own application or favorite test tool ...
- Keep into account that you will need to request an "API key"
(over the API Portal, accessible from the Library Browser)

What can I do with it?

Real-life examples

- Automated generation of eCRFs (e.g. in ODM format) for CDASH
- Generation of template define.xml files for different versions of SDTMIG, SENDIG and ADaMIG (SDTM-ETL)
- Automated update of CDISC-CT in own applications and repositories
- "Diffs" between standards versions (for impact analysis)
- Validation of metadata of (SDTM) submissions
Example: Smart Submission Dataset Viewer
- and much much more ...

Implementation of the CDISC Library API in the "Smart Submission Dataset Viewer"

The image displays the 'Smart Submission Dataset Viewer' application window. The interface includes a 'Standard' dropdown set to 'SDTM', a 'Define.xml' field with a file path, and radio buttons for 'Dataset-XML', 'Dataset-JSON', and 'CSV Files'. A list of dataset files is shown, with 'Add', 'Remove', and 'Clear' buttons. Below this are checkboxes for 'Use TYPED ItemData', 'Show record number in first column', and 'Bring SUPPQUAL data back to original dataset'. A progress bar shows '6%' completion for '9/9 files read'. Further down, there are checkboxes for 'Perform CORE validation on datasets', 'Create extended JSON report', and 'Create and show Validation report table'. At the bottom, there are 'Start' and 'Interrupt' buttons.

Overlaid on the right side is a terminal window titled 'system32/cmd.exe' showing the following log output:

```
58:42,934 INFO Loading file vs.json took 20.823 seconds
58:43,081 INFO Starting reading file = suppdm.json - dataset name = SUPPDM - domain = DM - size = 1kB
58:43,081 INFO Created new DataChecker
58:43,081 INFO # rows checked = 0
58:43,081 INFO Starting generating column header tooltips
58:43,081 WARN defForColumn for column = Rec.# = null
58:43,081 INFO Getting CDISC Library information for variable = STUDYID
58:43,768 INFO Variable name = STUDYID
58:43,768 INFO Getting CDISC Library information for variable = RDOMAIN
58:45,790 INFO Associated CodeList NCI Code = C66734 CDISC-CT Version = sdtmct-2022-12-16
58:45,790 INFO Getting CDISC Library codeList information for variable = RDOMAIN and CodeList NCI code C66734
58:45,790 INFO Using cached version for CDISC Library CodeList = C66734
58:45,790 INFO Getting CDISC Library information for variable = USUBJID
58:46,493 INFO Variable name = USUBJID
58:46,493 INFO Getting CDISC Library information for variable = IDVAR
2023-03-08 10:58:48,499 INFO Getting CDISC Library information for variable = IDVARVAL
2023-03-08 10:58:50,569 INFO Getting CDISC Library information for variable = QNAM
58:46,493 INFO Getting CDISC Library information for variable = QLABEL
58:46,493 INFO Getting CDISC Library information for variable = QVAL
2023-03-08 10:58:54,000 INFO Getting CDISC Library information for variable = QORIG
2023-03-08 10:58:54,000 INFO Getting CDISC Library information for variable = QEVAL
2023-03-08 10:58:54,000 INFO Finished reading file = suppdm.json - dataset name = SUPPDM - domain = DM
2023-03-08 10:58:54,000 INFO Loading file suppdm.json took 17.932 seconds
2023-03-08 10:58:54,000 INFO treated all files
2023-03-08 10:58:54,000 INFO Done
2023-03-08 10:58:54,000 INFO SmartSDTMViewerLoader done
2023-03-08 10:58:54,000 INFO Will now do CDISC Library lookup for NCI code = C66727
2023-03-08 10:58:54,000 INFO Will now do CDISC Library lookup for NCI code = C71620
```


Conclusions

- The CDISC Library is the "CDISC truth"
- With the Library Browser and the API, one almost does not need to inspect the PDF documents anymore
- The API can be implemented in every modern software language, and in statistical software (R, SAS, ...)
- The CDISC Library allows to automate a large number of tasks that are otherwise cumbersome (manual lookup, writing custom software, ...)