

# MM-23: Enhancing Dictionary Management and Automation with NCI EVS: A Deeper Dive for the CDISC Community

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# Meet the Speaker

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**Organization:** CDISC

A data engineer by day, tech tinkerer by hobby, and newly minted health informatics grad from Tufts University. Spent a good chunk of his career in the biopharma world, including over a decade at CDISC, where he had a hand in projects like the CDISC Library, Controlled Terminology Relationships, Biomedical Concepts, CORE, and 360i. Always on the lookout for smarter ways to work with clinical data.



## Before We Start

- Please feel free to follow along
- My conference proceedings are on GitHub (License: CC BY 4.0): <https://github.com/chowsanthony/pharmasug2025us>





**NCI EVS isn't just for downloading spreadsheet files. It has a powerful system that manages CDISC Controlled Terminology (CT) behind the scenes.**

# Trivia



True or False. NCI EVS data resources are behind the paywall.

How many dictionaries are there in CDISC CT?  
a) 11 b) 1 c) 3

Which file format CDISC Controlled Terminology supports when downloading CDISC CT?  
a) CT-XML b) OWL/RDF c) JSON



## EVS Explore

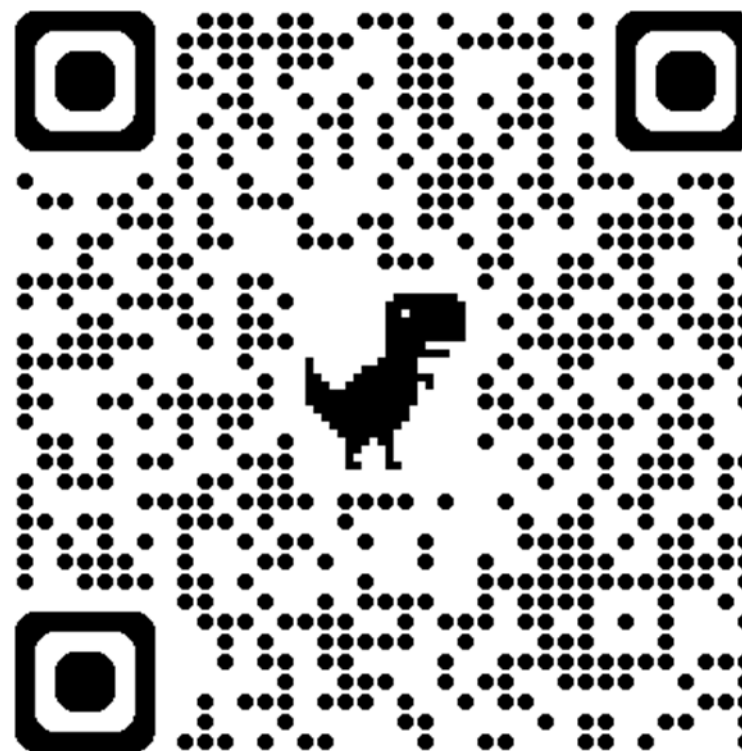
*"A consistent, user-friendly tool to browse, search and retrieve content from NCI Thesaurus (NCIt) and other medical terminologies."*

# EVS Explore

## Step-by-step

1. Google "NCI EVS Explore"
2. Select "EVS Explore - National Cancer Institute"
3. Search for "Unknown"
4. Select "C17998" from the result

## Mobile Phone



# Filter on Contributing Source

Click CDISC on the top to reduce the information only relevant to CDISC

Unknown ( Code - C17998 ) --

[Open in Hierarchy](#)

[Term Suggestion Form](#)

[Collapse All](#)

[Export](#)

[New Search](#)

[All](#) | [ACC/AHA](#) | [caDSR](#) | **[CDISC](#)** | [CTDC](#) | [DIPG/DMG](#) | [FDA](#) | [GDC](#) | [HL7](#) | [ICDC](#) | [NCI](#) | [OORO](#) | [PCDC](#) | [SeroNet](#) | [UCUM](#)





# Review NCI C-Code & Attributes

NCIt Preferred Term & Definition from each contributing source.

NCI Thesaurus Code:	C17998 ( <a href="#">Search for linked caDSR metadata</a> )
Semantic Type(s):	Idea or Concept
Preferred Name:	Unknown

Definitions ( 6 ) <a href="#">[top]</a>			-
Definition ↑↓	Source ↑↓	Attribution	
Not known, not observed, not recorded, or refused. (NCI)	CDISC		

# Sort on Code Column

For CDISC CT, Code refers to the list of CT subsets and codelists that a concept is linked to. PT becomes the Submission Value.

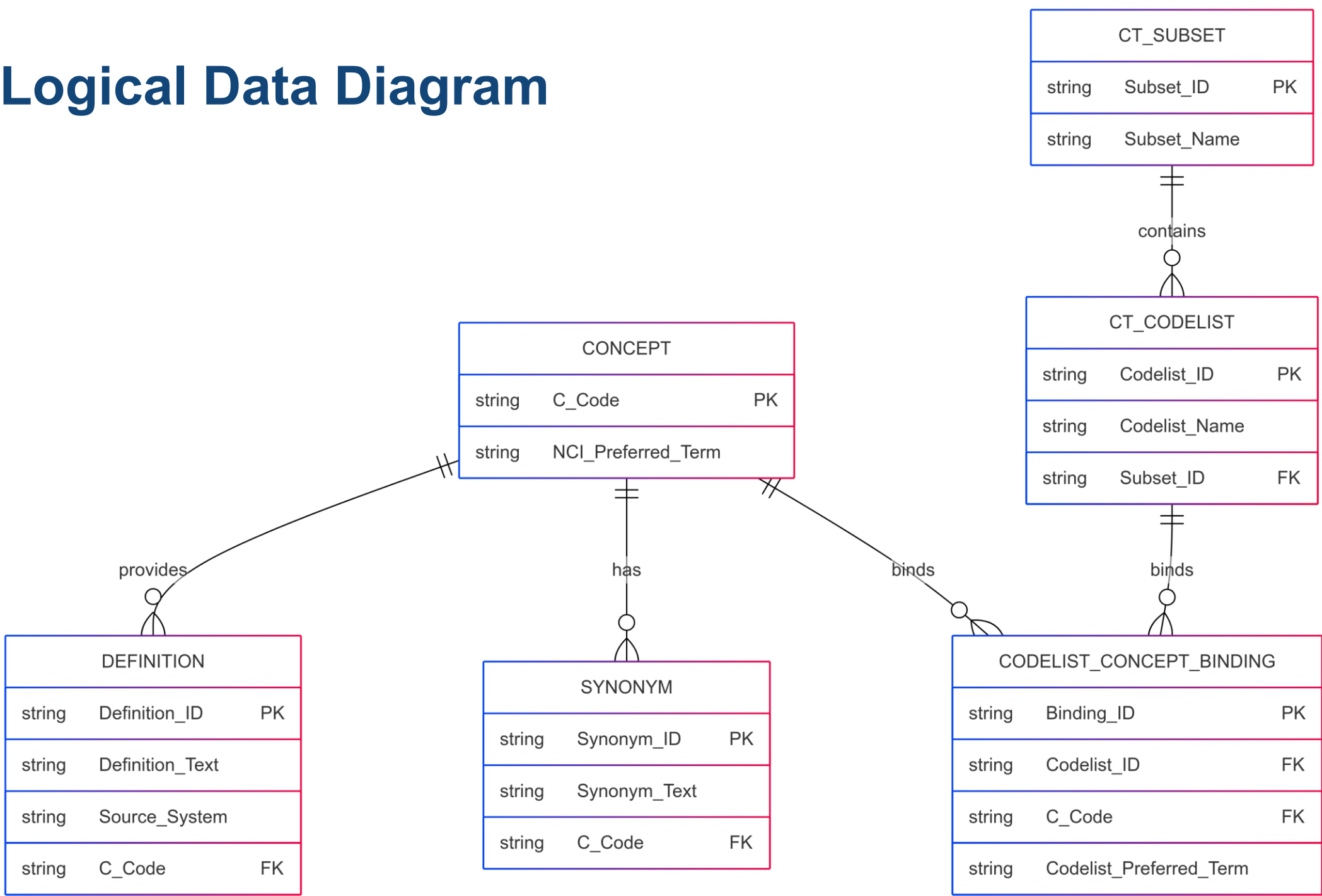
Synonyms & Abbreviations ( 58 ) <a href="#">[top]</a>				
Term ↑↓	Source ↑↓	Term Type ↑↓	Code ≡	Subsource Name ↑↓
UNKNOWN	CDISC	PT	CDASH-CMDOSFRQ	
UNKNOWN	CDISC	PT	CDASH-EXDOSFRQ	
UNKNOWN	CDISC	PT	SDTM-ACN	
UNKNOWN	CDISC	PT	SDTM-CLINSTRS	
UNKNOWN	CDISC	PT	SDTM-CVPRCIND	
UNKNOWN	CDISC	PT	SDTM-CVSLDEXT	

# Sort on Term Column

A concept can have different representations depending on context or constraints. U, UNK, Unknown are synonyms. This is sometimes referred to as semantic aliasing.

Synonyms & Abbreviations ( 58 ) <a href="#">[top]</a>				
Term ↑↓	Source ↑↓	Term Type ↑↓	Code ↑≡	Subsource Name ↑↓
U	CDISC	SY		
UNK	CDISC	SY		
Unknown	CDISC	SY		
UNKNOWN	CDISC	PT	CDASH-CMDOSFRQ	
UNKNOWN	CDISC	PT	CDASH-EXDOSFRQ	
UNKNOWN	CDISC	PT	SDTM-ACN	

# Logical Data Diagram







## EVS Rest API (EVSRESTAPI)

*"An API that EVS offers connected to a native triple-stored backend terminology server with Elasticsearch indexes. It allows searches that capture the complete logical semantics of underlying terminologies."*

# EVS Rest API

## Step-by-step

1. Launch web browser
2. Enter <https://api-evsrest.nci.nih.gov/api/v1/concept/ncit/C17998>

## Mobile Phone



# API Basics

Term	Definition	Example
<b>operation</b>	The method to be performed. GET is commonly used for retrieving information; other methods include POST, PUT, DELETE.	GET
<b>scheme</b>	The transfer protocol used by the API. For security, always use https instead of http.	https
<b>host</b>	The domain name or IP address that serves the API.	api.example.com or 192.168.1.10
<b>base path</b>	The base path on the host where the API is served, relative to the host root.	/api/v1
<b>base URL</b>	The combination of scheme, host, and base path, forming the base address for API calls.	https://api.example.com/api/v1
<b>endpoint</b>	The specific path and operation provided by the API for interacting with a resource.	/users/{userId}, /orders/{orderId}
<b>path parameter</b>	A variable part of the endpoint path used to target a specific resource. Indicated with curly braces {} in the path.	{userId} → usr482853 {orderId} → 1500005264201

# GET <https://api-evsrest.nci.nih.gov/api/v1/concept/ncit/C17998>

Term	Definition	Example
<b>operation</b>	The method to be performed. GET is commonly used for retrieving information; other methods include POST, PUT, DELETE.	GET
<b>scheme</b>	The transfer protocol used by the API. For security, always use https instead of http.	https
<b>host</b>	The domain name or IP address that serves the API.	api-evsrest.nci.nih.gov
<b>base path</b>	The base path on the host where the API is served, relative to the host root.	/api/v1
<b>base URL</b>	The combination of scheme, host, and base path, forming the base address for API calls.	https://api-evsrest.nci.nih.gov/api/v1
<b>endpoint</b>	The specific path and operation provided by the API for interacting with a resource.	/concept/{terminology}/{code}
<b>path parameter</b>	A variable part of the endpoint path used to target a specific resource. Indicated with curly braces {} in the path.	{terminology} → ncit {code} → C17998

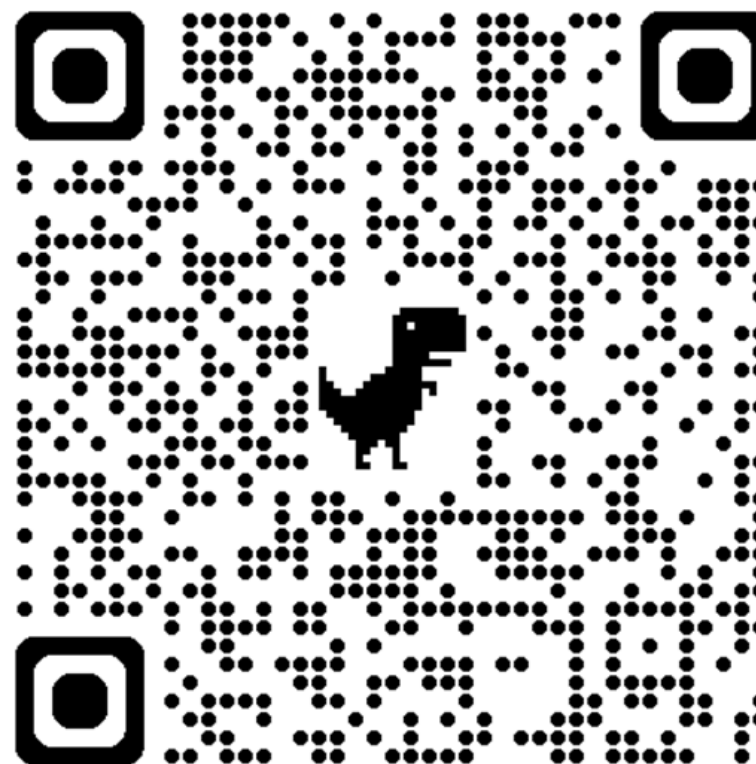


# API Testing Portal

## Step-by-step

1. Launch web browser
2. Enter <https://api-evsrest.nci.nih.gov/swagger-ui/index.html>
3. Locate "Concept endpoints"
4. Open to `/api/v1/concept/{terminology}/{code}`
5. Click "Try it out"
6. Enter 2 required parameters
7. Click "Execute"

## Mobile Phone



# NCI EVS Rest API

2.1.0.RELEASE

OAS 3.0

[/v3/api-docs](#)

Endpoints to support searching, metadata, and content retrieval for EVS terminologies. To learn more about how to interact with this api, see the [Github evsrestapi-client-SDK project](#).

[Terms of service](#)

[Contact NCI EVS](#)

Servers

/

## Application version endpoint

### Concept endpoints

GET /api/v1/concept/{terminology} Get concepts specified by list parameter

GET /api/v1/concept/{terminology}/{code} Get the concept for the specified terminology and code

#### Parameters

Name	Description
<b>terminology</b> * required string (path)	Terminology, e.g. 'ncit' or 'ncim' ( <a href="#">See here for complete list</a> )
<b>code</b> * required string (path)	Code in the specified terminology, e.g. <ul style="list-style-type: none"><li>'C3224' for <i>ncit</i></li><li>'C0025202' for <i>ncim</i></li></ul>
<b>limit</b> integer(\$int32) (query)	If set to an integer (between 1 and 100), elements of the concept should be limited to that specified number of entries. Thus a user interface can quickly retrieve initial data for a concept (even with <i>include=full</i> ) and then call back for more data. An extra placeholder entry with just a <i>ct</i> field will be included to indicate the total count.
<b>include</b> string (query)	Indicator of how much data to return. Comma-separated list of any of the following values: minimal, summary, full, associations, children, definitions, disjointWith, history, inverseAssociations, inverseRoles, maps, parents, properties, roles, synonyms. <a href="#">See here for detailed information</a> .
<b>X-EVSRESTAPI-License-Key</b> string (header)	Required license information for restricted terminologies. <a href="#">See here for detailed information</a> .

Execute

Responses

Curl

```
curl -X 'GET' \
  'https://api-eva-rest.nci.nih.gov/api/v1/concept/ncit/C17998?limit=100&include=summary' \
  -H 'accept: application/json'
```

Request URL

```
https://api-eva-rest.nci.nih.gov/api/v1/concept/ncit/C17998?limit=100&include=summary
```

Server response

Code

Details

200

Response body

```
{
  "code": "C17998",
  "name": "Unknown",
  "terminology": "ncit",
  "version": "25.04d",
  "conceptStatus": "DEFAULT",
  "leaf": false,
  "active": true,
  "synonyms": [
    {
      "name": "Unknown",
      "termType": "PT",
      "type": "FULL_SYN",
      "source": "ACC/AHA",
      "code": "AV",
      "subSource": "SARS2"
    },
    {
      "name": "Unknown",
      "termType": "SY",
      "type": "FULL_SYN",
      "source": "caDSR"
    },
    {
      "name": "U",
      "termType": "PT",
      "type": "FULL_SYN",
      "source": "CDISC",
      "code": "SDTM-SEVRS"
    }
  ]
}
```

Response headers

```
content-type: application/json
date: Sun, 25 May 2025 20:18:36 GMT
server: Apache
strict-transport-security: max-age=31536000; includeSubDomains; preload
```

Responses

Code	Description	Links
200	Successfully retrieved the requested information	No links



# Programmatic Consumptions of EVSRESTAPI

Raise a hand if

- ✓ *You are familiar with Power BI*
- ✓ *You have used Excel to consume web queries*

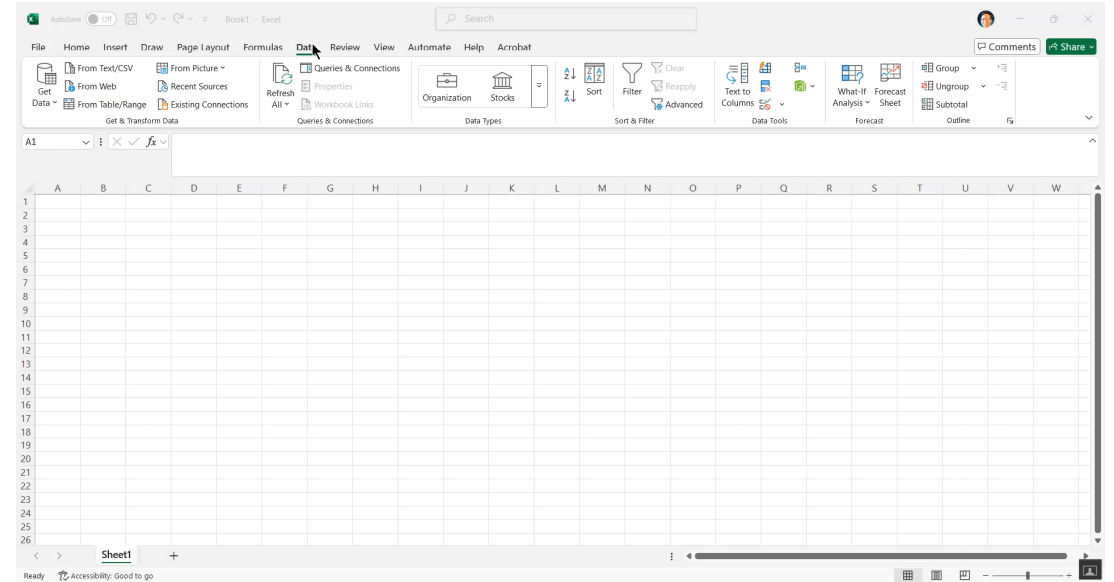


# Example No- & Low-Code Methods

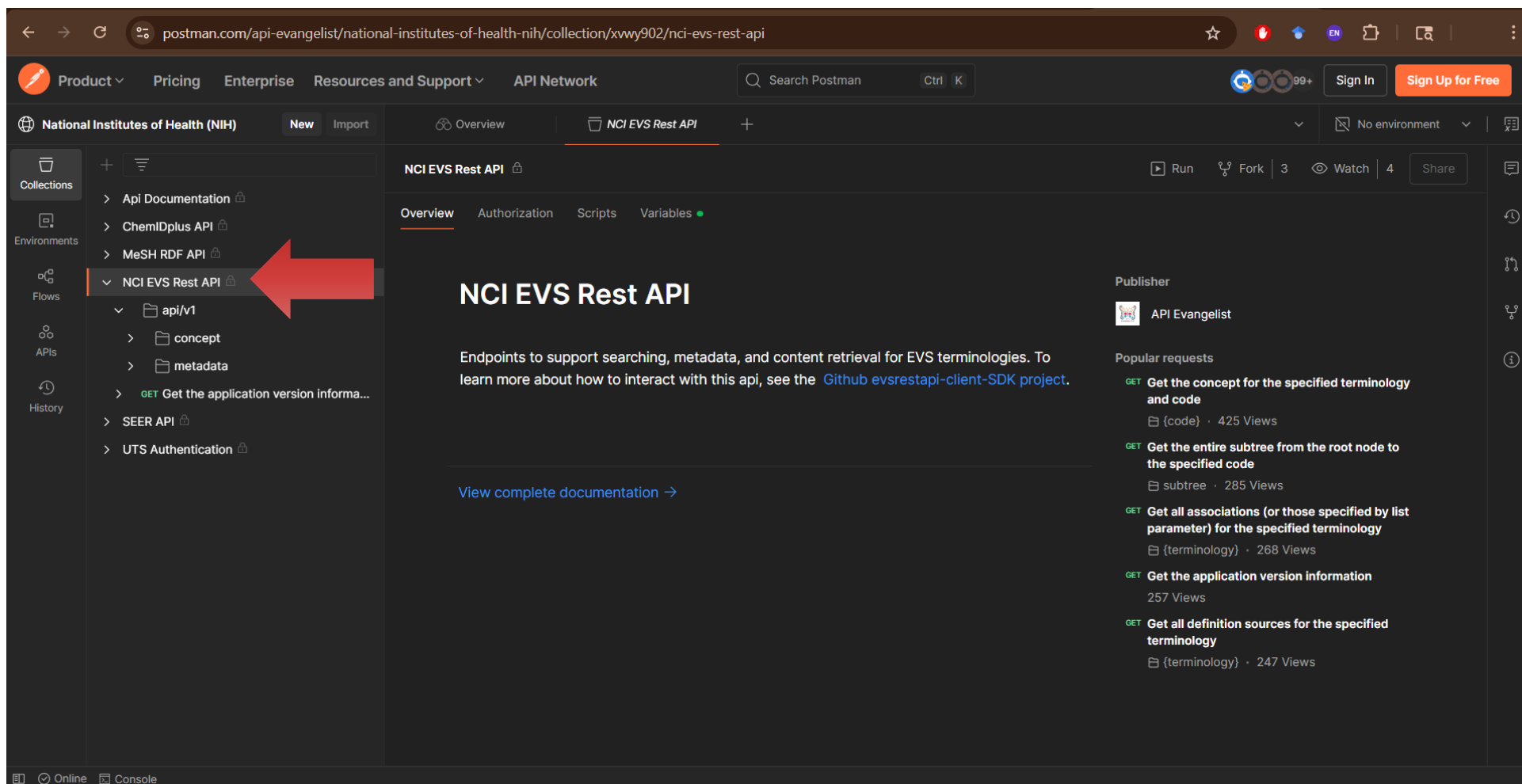
## Postman

1. Go to <https://www.postman.com/api-evangelist/national-institutes-of-health-nih>
2. Export the "NCI EVS Rest API" collection
3. Import into your own Postman workspace

## Excel



# Postman: Preconfigured Endpoint Collection



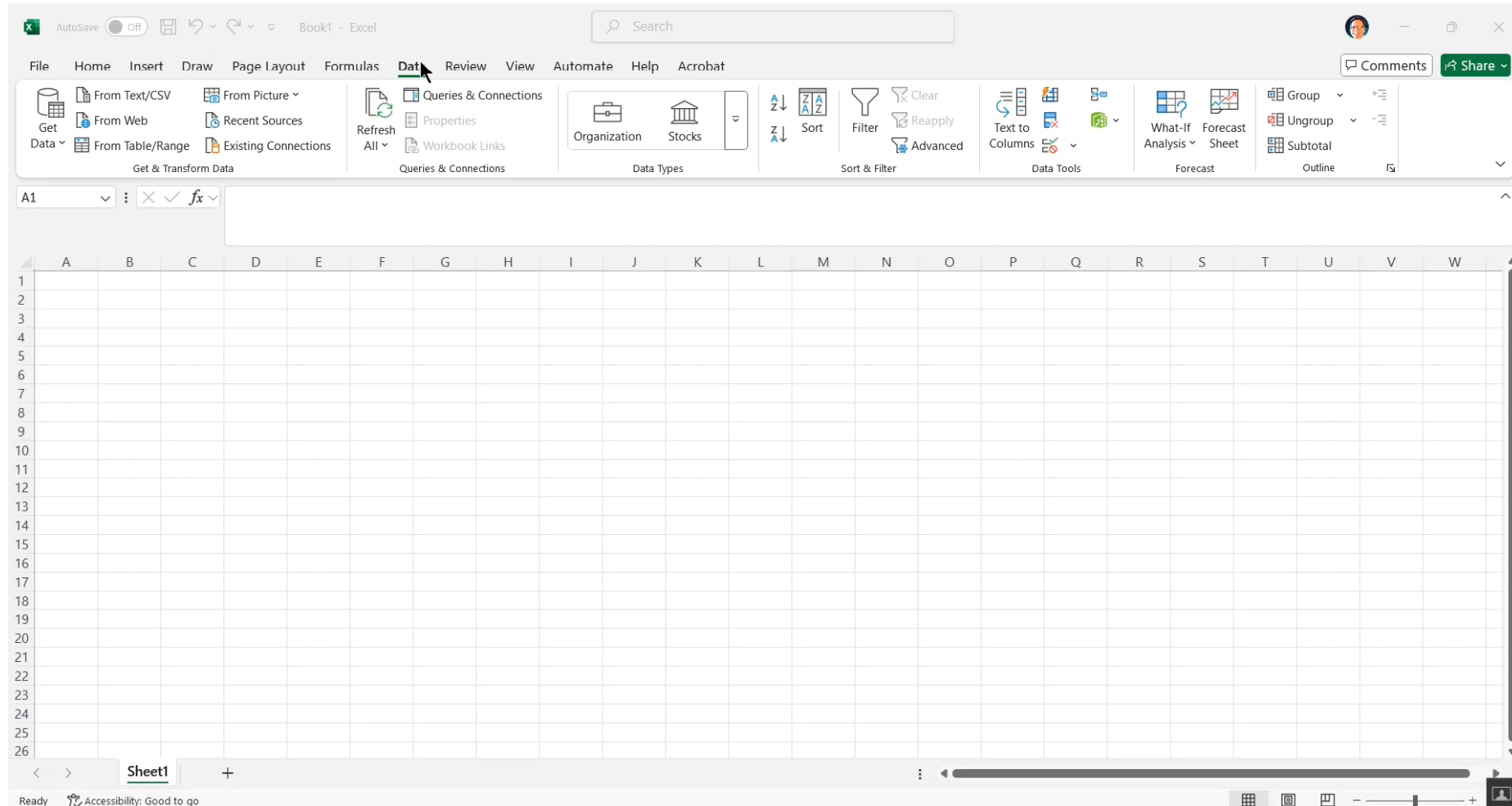
The screenshot displays the Postman web interface in a browser. The address bar shows the URL: `postman.com/api-evangelist/national-institutes-of-health-nih/collection/xvwy902/nci-evs-rest-api`. The top navigation bar includes links for Product, Pricing, Enterprise, Resources and Support, and API Network, along with a search bar and user options (Sign In, Sign Up for Free).

The main interface is divided into three sections:

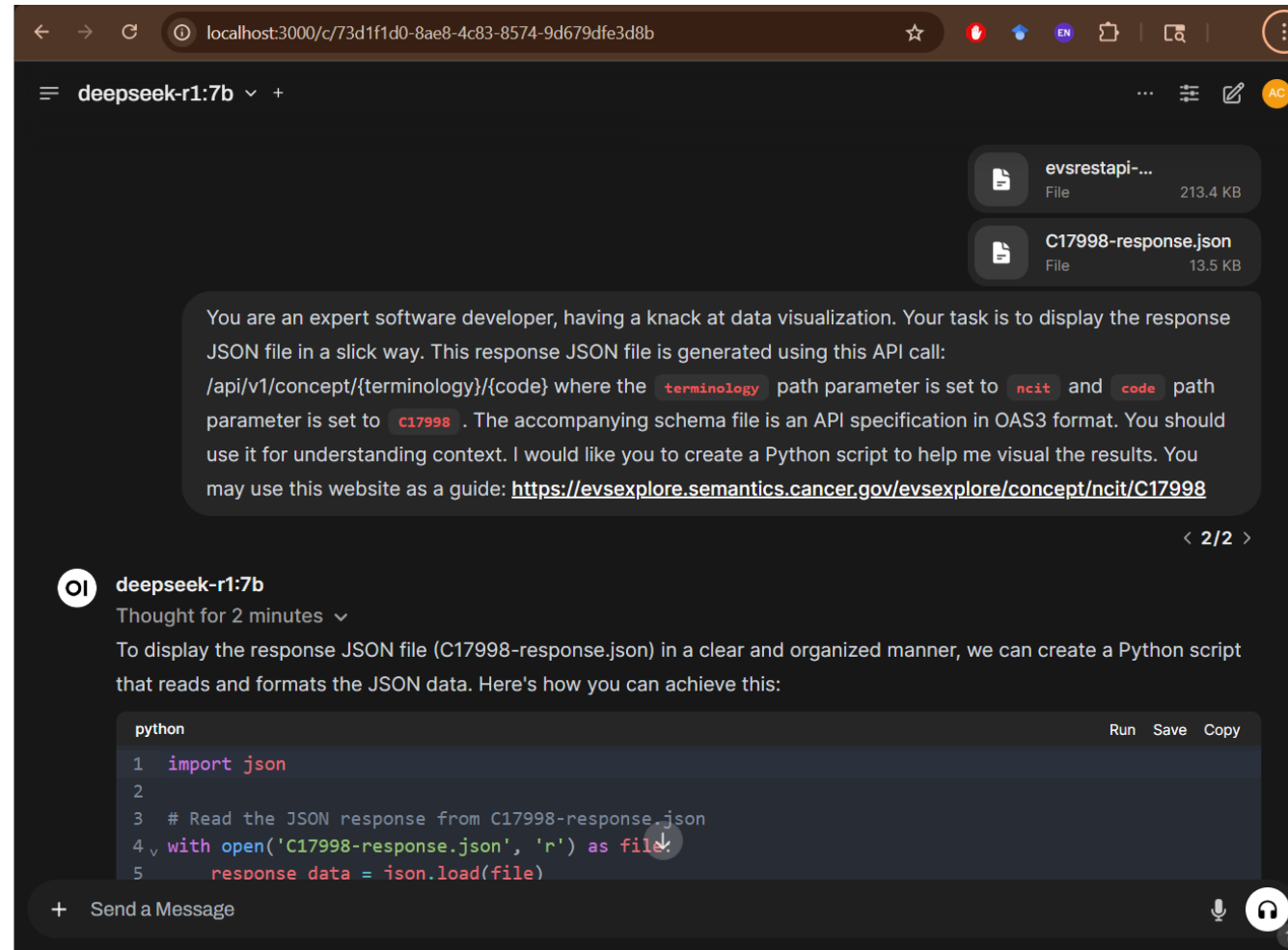
- Left Sidebar:** Contains a 'Collections' section with a tree view. The 'NCI EVS Rest API' collection is selected and highlighted with a red arrow. Below it, the 'Environments' section is visible.
- Center Panel:** Displays the 'NCI EVS Rest API' collection details. It includes tabs for Overview, Authorization, Scripts, and Variables. The 'Overview' tab is active, showing the title 'NCI EVS Rest API' and a description: 'Endpoints to support searching, metadata, and content retrieval for EVS terminologies. To learn more about how to interact with this api, see the [Github evsrestapi-client-SDK project](#).' A link 'View complete documentation →' is also present.
- Right Panel:** Shows the 'Publisher' as 'API Evangelist' and a list of 'Popular requests' with their respective view counts.

The bottom status bar indicates 'Online' and 'Console'.

# Power Query via Excel



# Vibe Coding & Modeling



localhost:3000/c/73d1f1d0-8ae8-4c83-8574-9d679dfe3d8b

deepseek-r1:7b

evsrestapi-...  
File 213.4 KB

C17998-response.json  
File 13.5 KB

You are an expert software developer, having a knack at data visualization. Your task is to display the response JSON file in a slick way. This response JSON file is generated using this API call:  
/api/v1/concept/{terminology}/{code} where the `terminology` path parameter is set to `ncit` and `code` path parameter is set to `C17998`. The accompanying schema file is an API specification in OAS3 format. You should use it for understanding context. I would like you to create a Python script to help me visual the results. You may use this website as a guide: <https://evsexplore.semantics.cancer.gov/evsexplore/concept/ncit/C17998>

< 2/2 >

deepseek-r1:7b  
Thought for 2 minutes

To display the response JSON file (C17998-response.json) in a clear and organized manner, we can create a Python script that reads and formats the JSON data. Here's how you can achieve this:

```
python
1 import json
2
3 # Read the JSON response from C17998-response.json
4 with open('C17998-response.json', 'r') as file:
5     response_data = json.load(file)
```

+ Send a Message





# Biomedical Concepts Case Study

*"Machine-readable units of knowledge that include preconfigured data elements and terms."*

# Glucose Related Concepts

1. Navigate to EVS Explore
2. Enter "Glucose" to search
3. Select "C2831"
4. What does Semantic Type say?
5. Is CDISC one of the sources?
6. What happens when you click Open in Hierarchy?

*Repeat for "C105585"*

# Trivia

True or **False**. NCI EVS data resources are behind the paywall.

How many dictionaries are there in CDISC CT?  
a) 11 b) **1** c) 3

Which file format CDISC Controlled Terminology supports when downloading CDISC CT?  
a) **CT-XML** b) **OWL/RDF** c) **JSON**

# Useful Links

- Speaker's GitHub repo: <https://github.com/chowsanthony/pharmasug2025us>
- EVS Explore's main page: <https://evsexplore.semantics.cancer.gov>
- Unknown (C17998) in EVS Explore: <https://evsexplore.semantics.cancer.gov/evsexplore/concept/ncit/C17998>
- Unknown (C17998) as API response: <https://api-evsrest.nci.nih.gov/api/v1/concept/ncit/C17998>
- EVS Rest API Testing Portal: <https://api-evsrest.nci.nih.gov/swagger-ui/index.html>
- Postman endpoint collection: <https://www.postman.com/api-evangelist/national-institutes-of-health-nih/documentation/xvwy902/nci-evs-rest-api>