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

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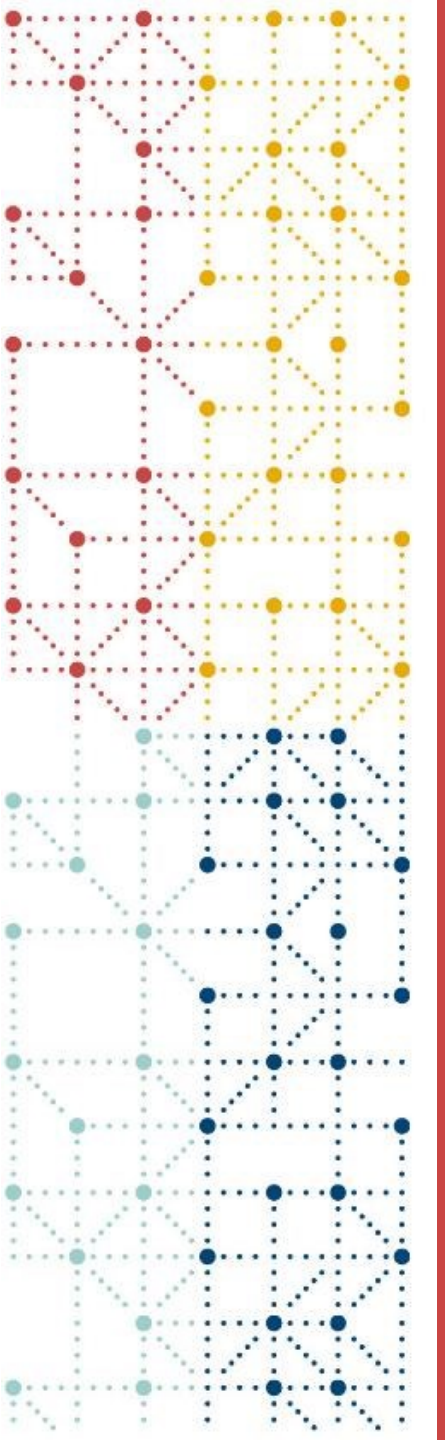
Meet the Speaker

Anthony Chow, MS-HIA

Title: Executive Director, Data Science

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.

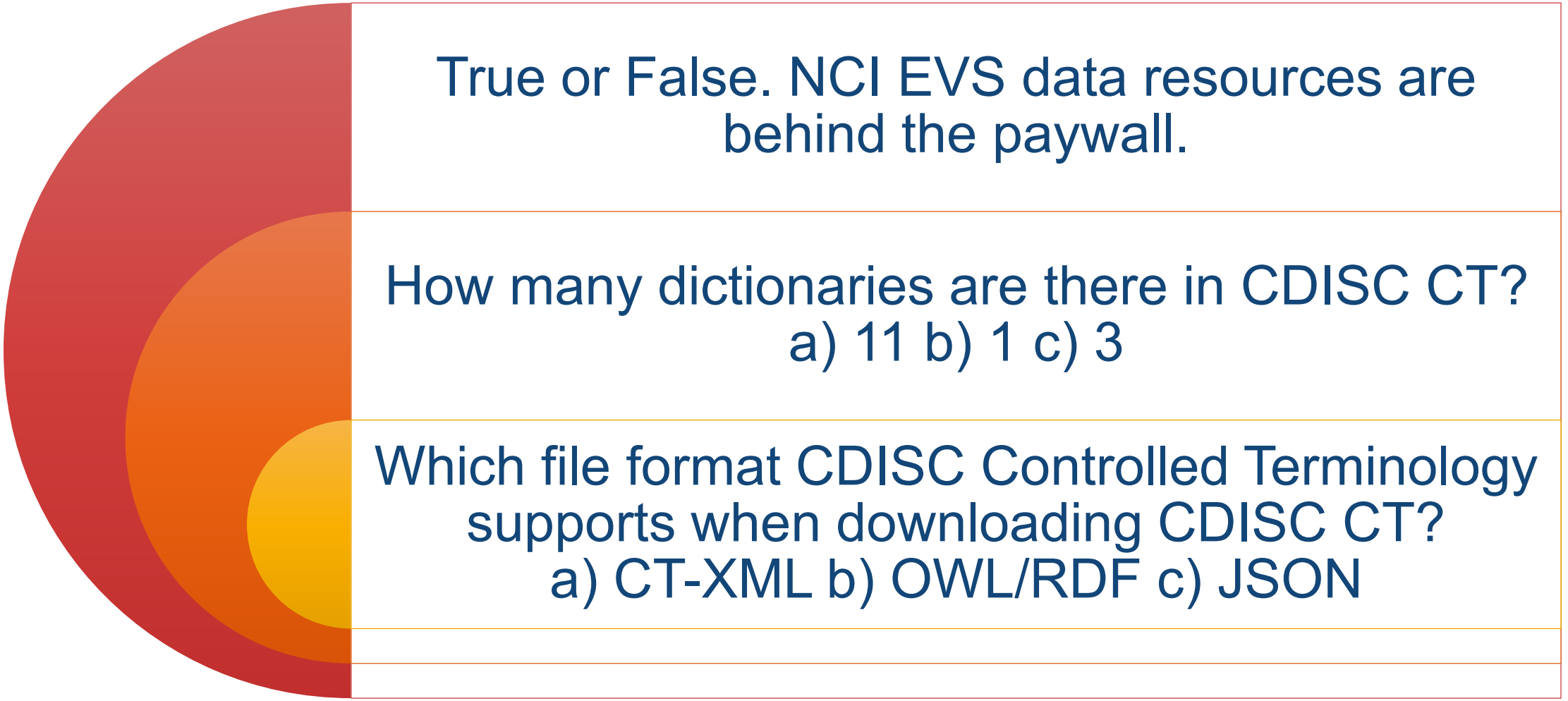


Before We Start

- 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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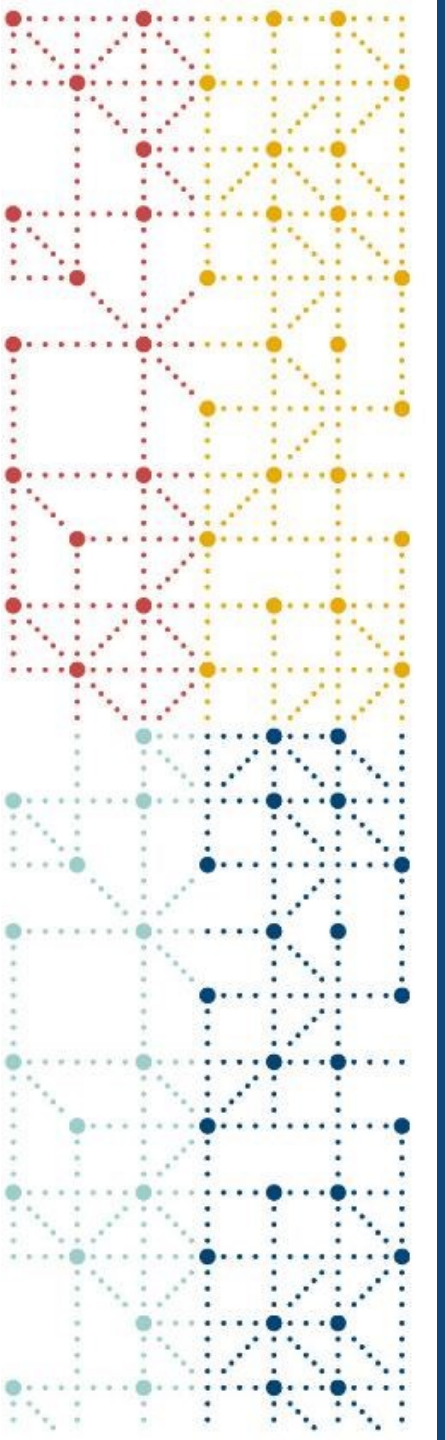
How many dictionaries are there in CDISC CT?
a) 11 b) 1 c) 3
Which file format CDISC Controlled Terminology supports when downloading CDISC CT?
a) CT-XML b) OWL/RDF c) JSON



EVS Explore

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

EVS Explore

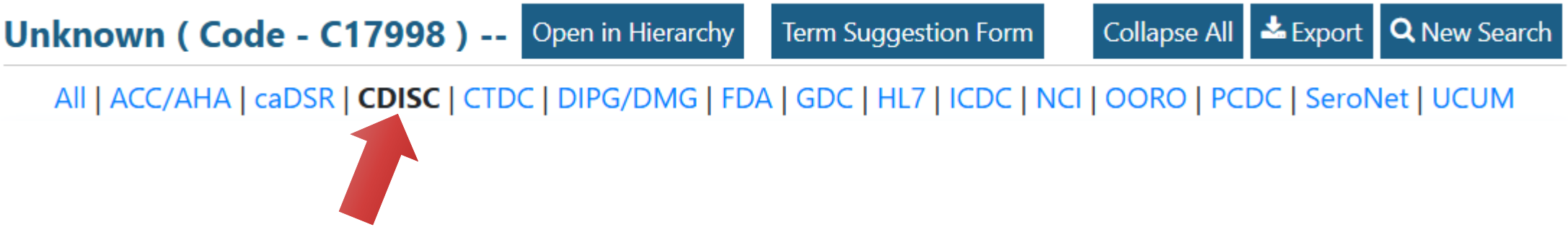
Step-by-step

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



Review NCIt C-Code & Attributes

NCIt Preferred Term & Definition from each contributing source.

NCI Thesaurus Code:	C17998 (Search for linked caDSR metadata)
Semantic Type(s):	Idea or Concept
Preferred Name:	Unknown

Definitions (6) [top] −

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) [top]

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	

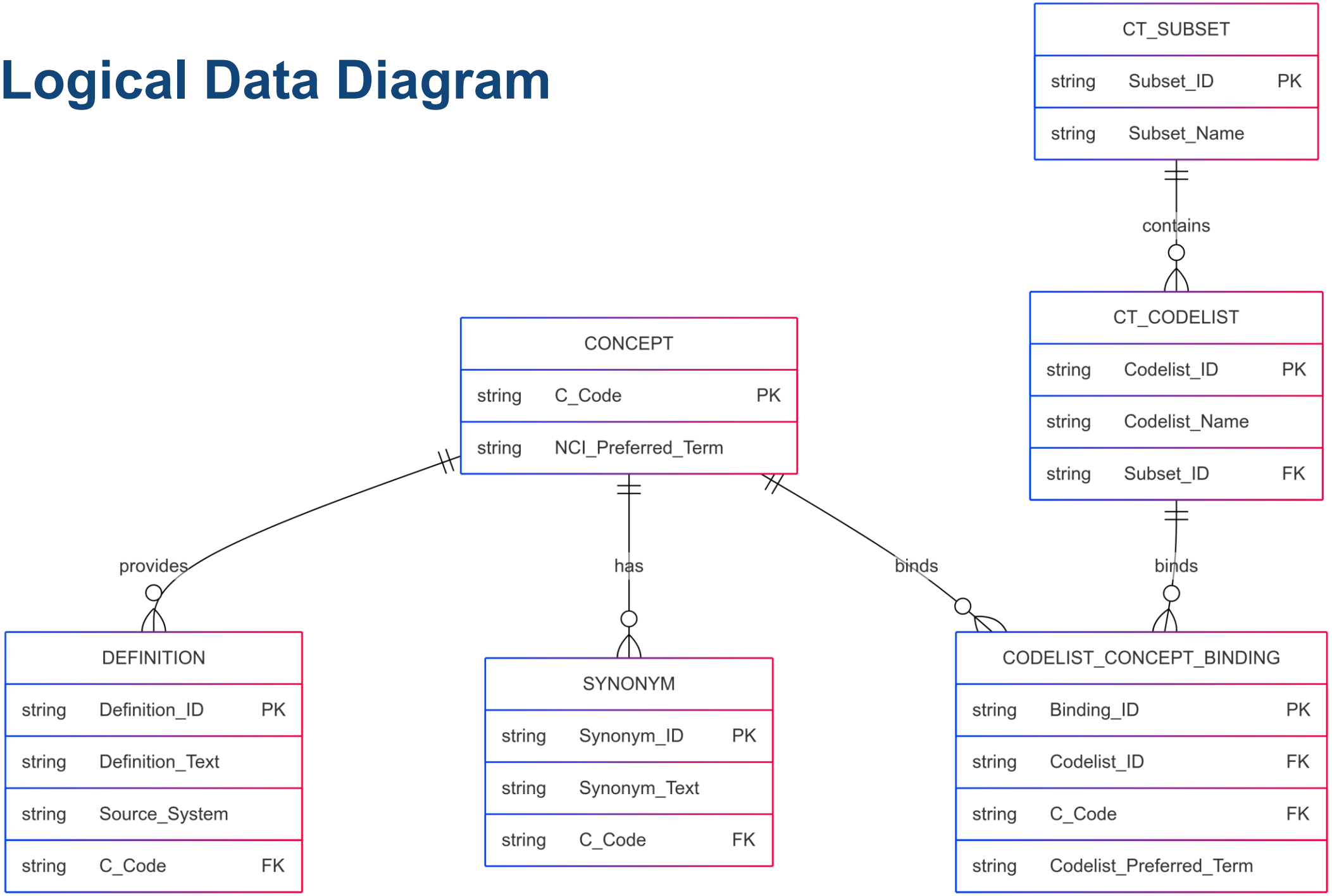
Sort on Term Column

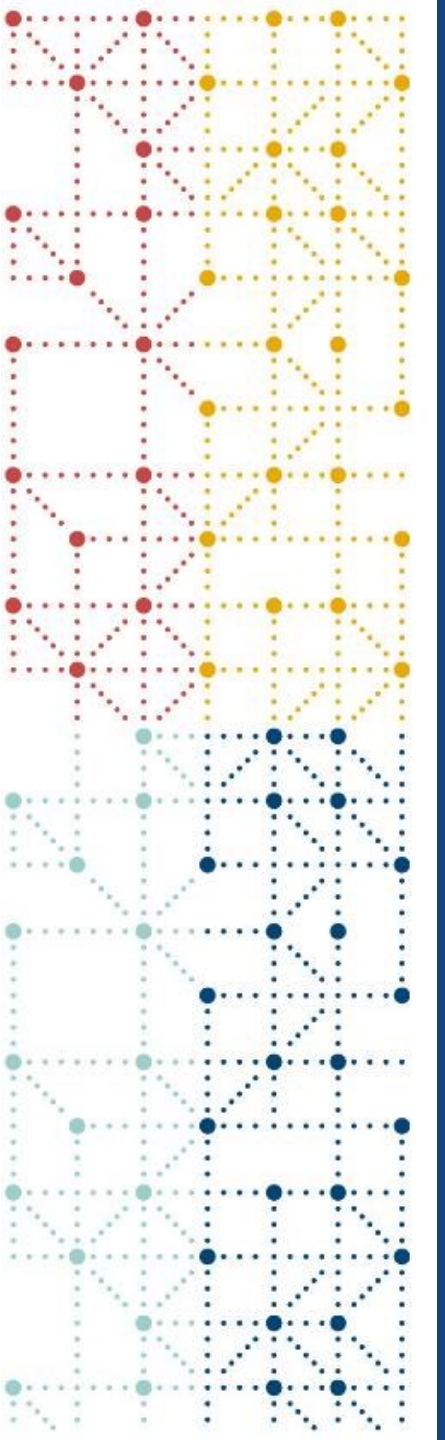
A concept can have different representations depending on context or constraints. U, UNK, Unknown are synonyms. This is sometimes referred to semantic aliasing.

Synonyms & Abbreviations (58) [top]

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

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endpoint	The specific path and operation provided by the API for interacting with a resource.	/concept/{terminology}/{code}
path parameter	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

1

Parameters

Cancel

2

Name	Description
terminology * required string (path)	Terminology, e.g. 'ncit' or 'ncim' (See here for complete list) ncit 3
code * required string (path)	Code in the specified terminology, e.g. • 'C3224' for *ncit* • 'C0025202' for *ncim* C17998 4
limit 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 *include=full*) and then call back for more data. An extra placeholder entry with just a *ct* field will be included to indicate the total count. 100
include 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. See here for detailed information. summary
X-EVSRESTAPI-License-Key string (header)	Required license information for restricted terminologies. See here for detailed information. X-EVSRESTAPI-License-Key

5

Execute

Responses

Curl

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

Request URL

```
https://api-evsrest.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"
```

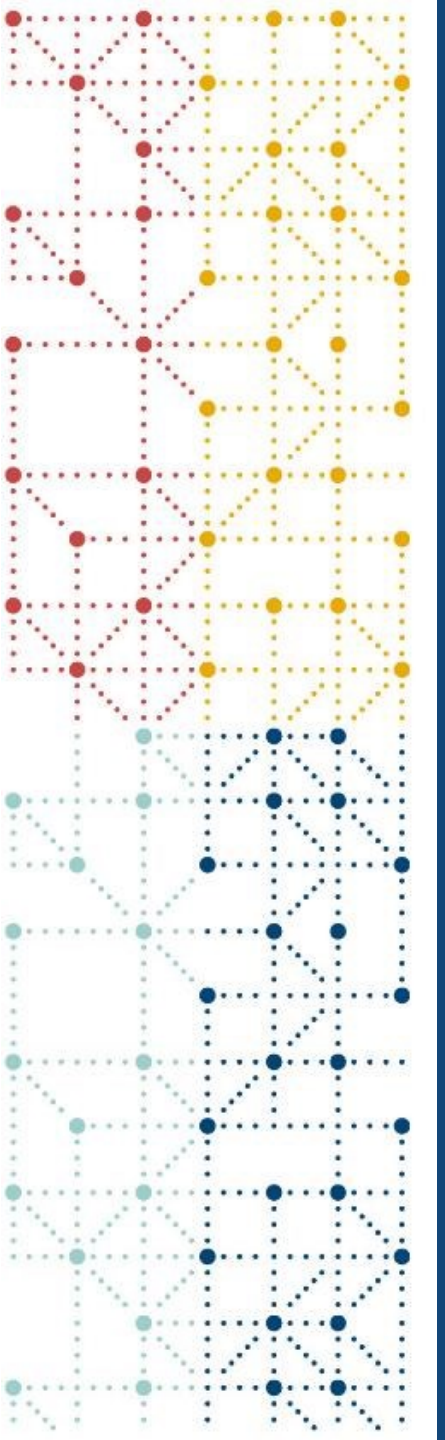

Download

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

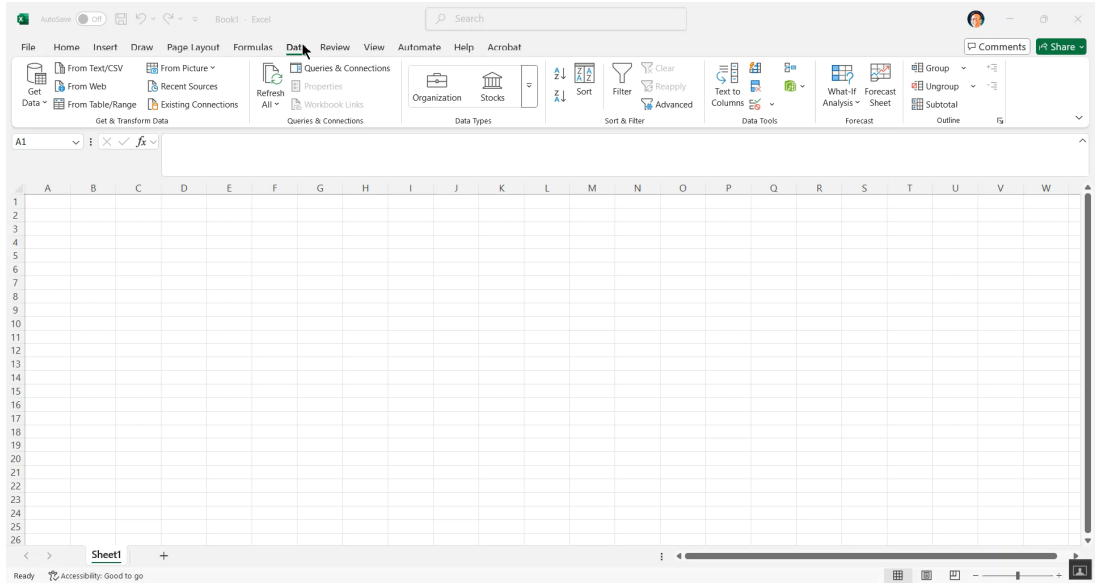
- ✓ *You are familiar with Power BI*
- ✓ *You have used Excel to consume web queries*

Example No- & Low-Code Methods

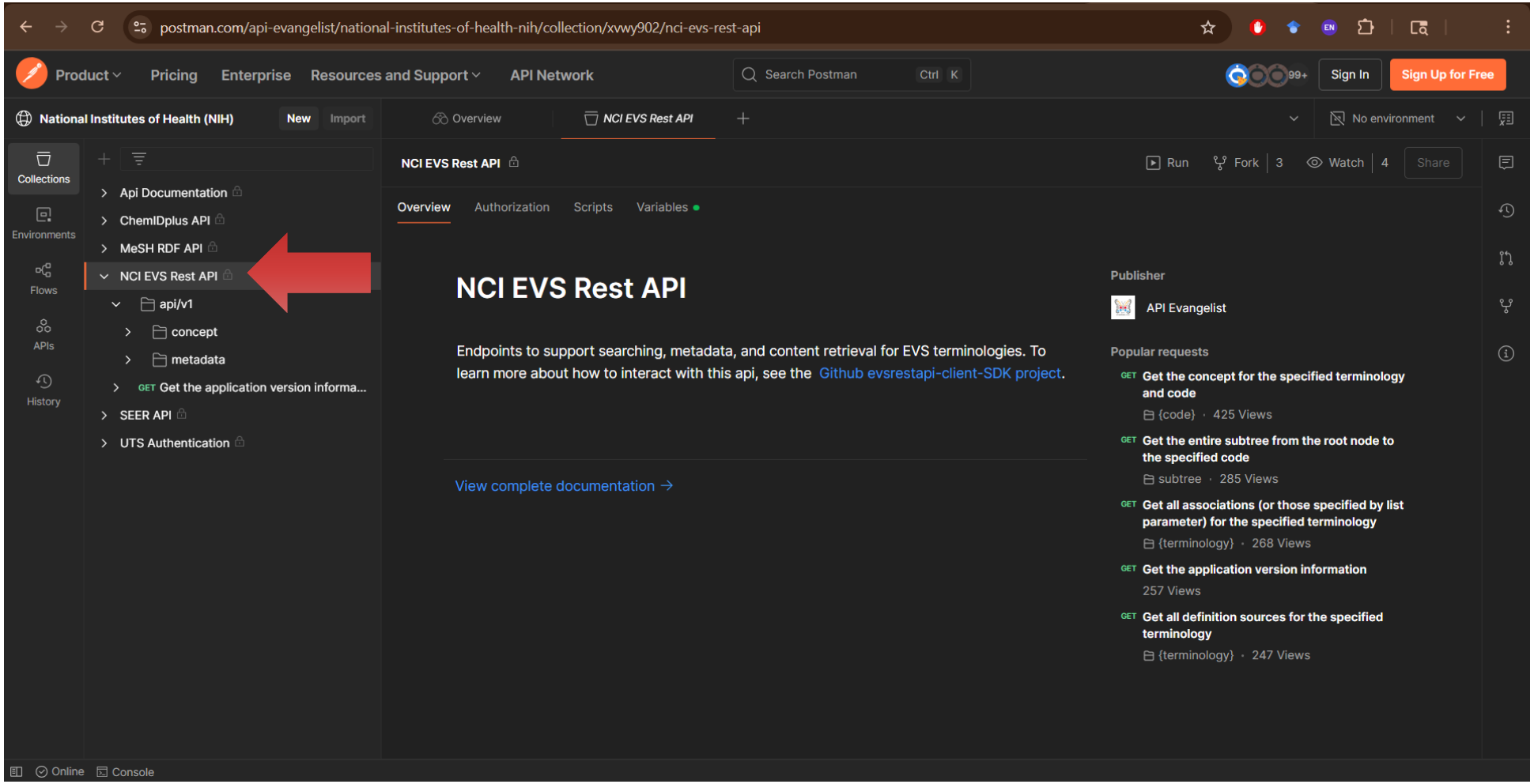
Postman

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

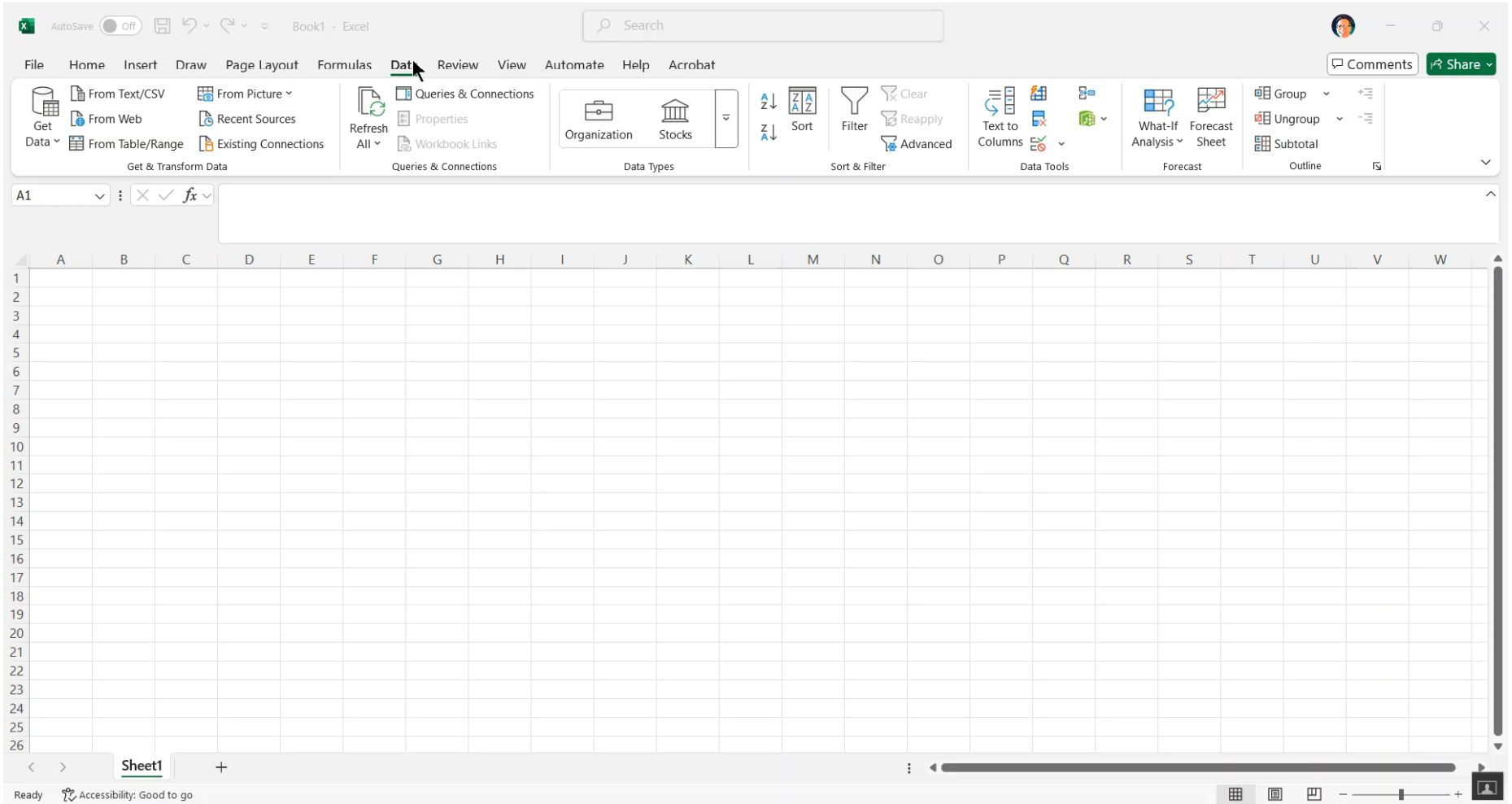
Excel



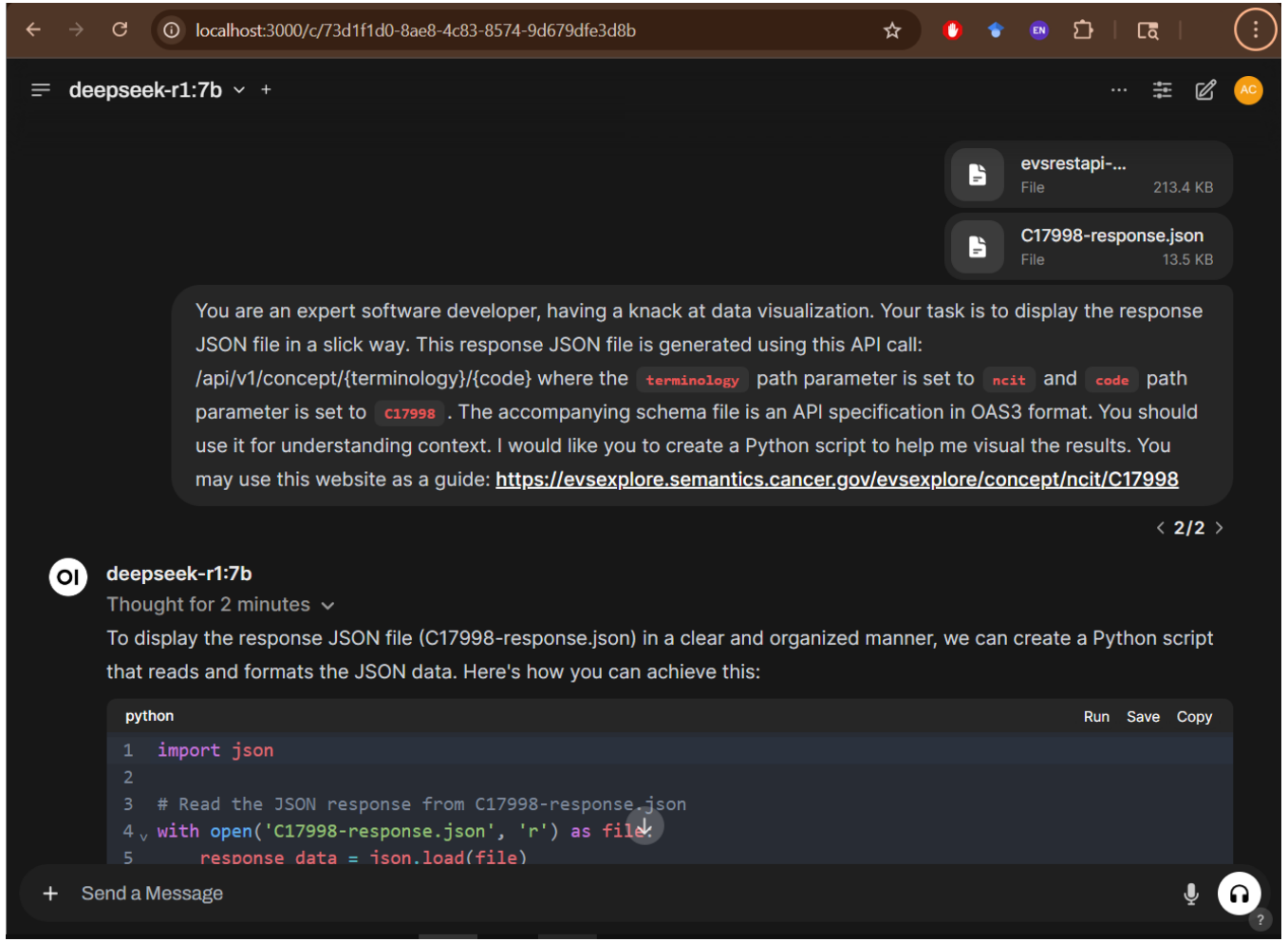
Postman: Preconfigured Endpoint Collection

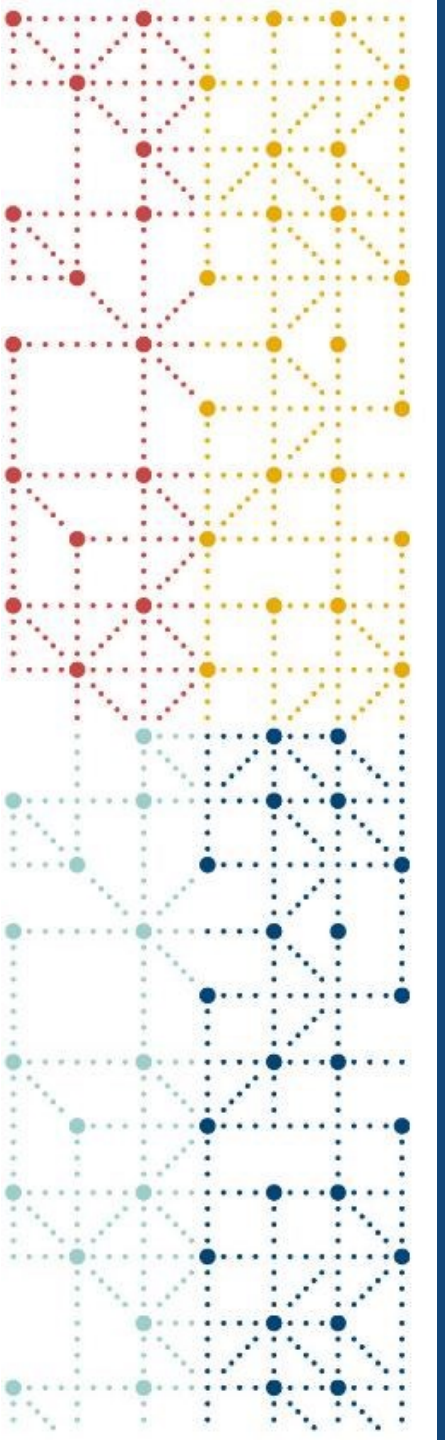


Power Query via Excel



Vibe Coding & Modeling





Biomedical Concepts Case Study

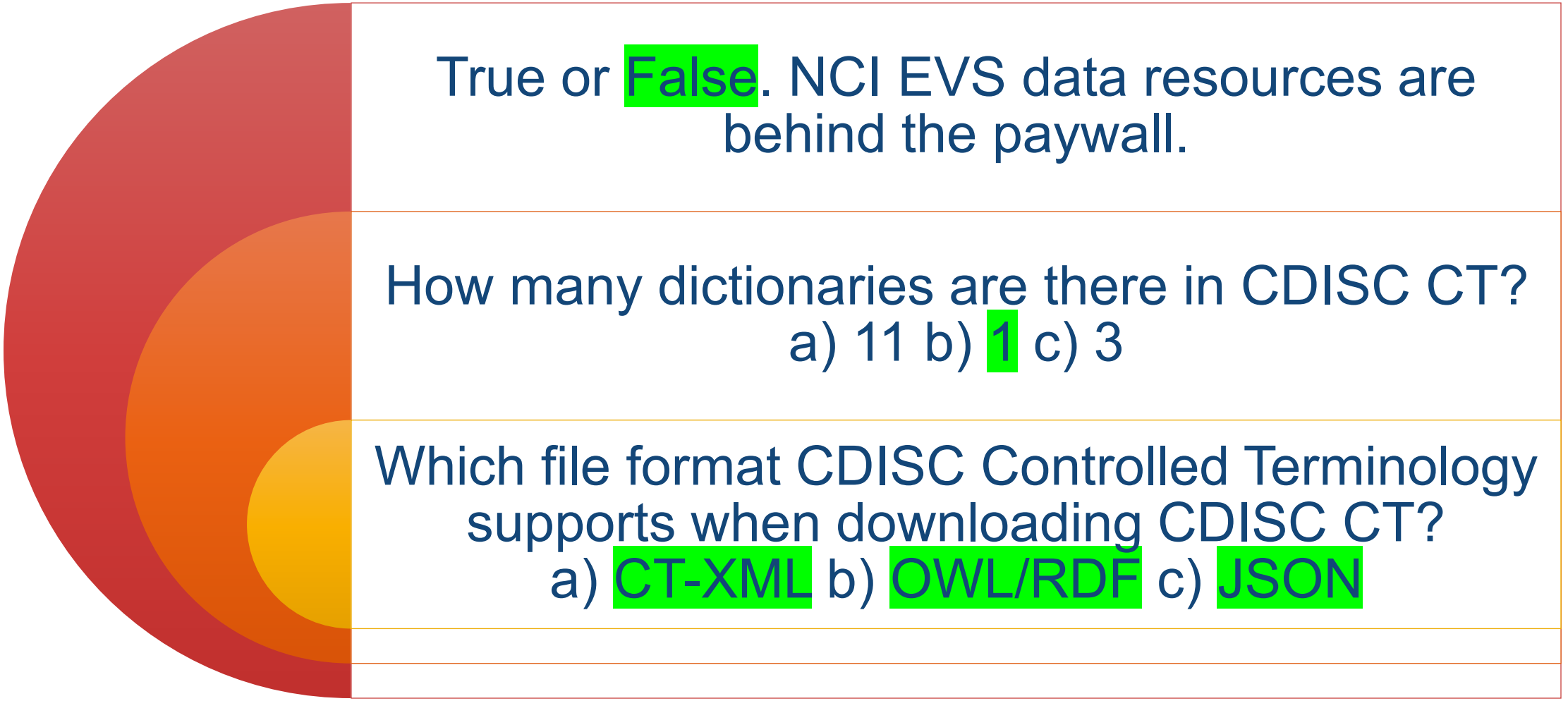
"Machine-readable units of knowledge that include preconfigured data elements and terms."

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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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