
Shown here is a mindmap describing a medical or health science concept. Each node (a discrete piece of knowledge) is linked to other nodes.

Figure 12: cDNA Microarray Two Channel Preparation and Processing
Modeling of microarray preparation is based upon protocols outlined by the National Human Genome Research Institute (NHGRI) at http://research.nhgri.nih.gov/microarray/protocols.html. Methodologies may vary.

State diagram is the analogue in data science and system design. A state diagram is a model of deterministic graph with nodes and arcs.
The nodes are called state, the arcs are transition. One may follow a transition to go from one state to another, and to navigate around the entire graph.

The Role of HATEOAS in CDISC Library API

- The heart of the CDISC Library is the API
- A couple of important constraints for REST API:
  - Each response contains links for next requests
  - Server provides clients a uniform method for determining what contents can be retrieved, actions can be performed, and formats can be represented
- Flattened representation for the linked data world of information
An API response in JSON format when querying about SDTMIG v3.2

A link ("href") is provided for one of the class objects accessible ("type"), whose name is Events Observation Class ("title").

An application client (web, mobile, or programming language of choice) can reliably use this uniform interface for subsequent requests.
This is the response after following the hyperlink given /mdr/sdtmig/3-2/classes/Events.

In other words, it is a state transition from SDTMIG v3.2 to the SDTMIG v3.2 Events class.

Metadata about SDTMIG v3.2's Events class

URL provided to access Events class metadata
A link ("href") is provided for one of the SDTM dataset objects accessible ("type"), whose name is Adverse Events Class ("title").

These links, for state transitions, aligns with the standards' hierarchy: classes > domains > variables > codelists.

```
  ordinal: "1"
  name: "AE"
  label: "Adverse Events"
  description: "An events domain that co.In, C49504, 2018-06-29"
  datasetStructure: "One record per adverse event per subject"
  _links:
    self: null
    href: "/mdr/sdtm/3-2/datasets/AE"
    title: "Adverse Events"
    type: "SDTM Dataset"
    parentProduct: null
    parentClass: null
    priorVersion: null
    datasetVariables: null
```

Two endpoints are useful:

- `/mdr/products`
- `/mdr/products/{product-family}`

Where, product family is one of these:

- Terminology
- DataCollection
- DataTabulation
- DataAnalysis

Highlighted is a link to the a CDISC Controlled Terminology package after querying for a full product listing.

Notice it is using the same uniform interface for linking.
_links:
  self:
    href:  "/mdr/products"
    title: "SHARE Product List"
    type: "SHARE Product List"
  data-collection: 
  data-tabulation: 
  data-analysis: 
  terminology:
    _links:
      self:
        href: "#/mdr/products/Terminology"
        title: "Product Group Terminology"
        type: "SHARE Product Group"
      0:
        href: "#/mdr/ct/packages/adamct-2014-09-26"
        title: "ADAM Controlled Terminology Package 19 Effective 2014-09-26"
        type: "Terminology"
  1:
    href: "#/mdr/ct/packages/adamct-2015-12-18"
    title: "ADAM Controlled Terminology Package 24 Effective 2015-12-18"
    type: "Terminology"