



# CEDAR

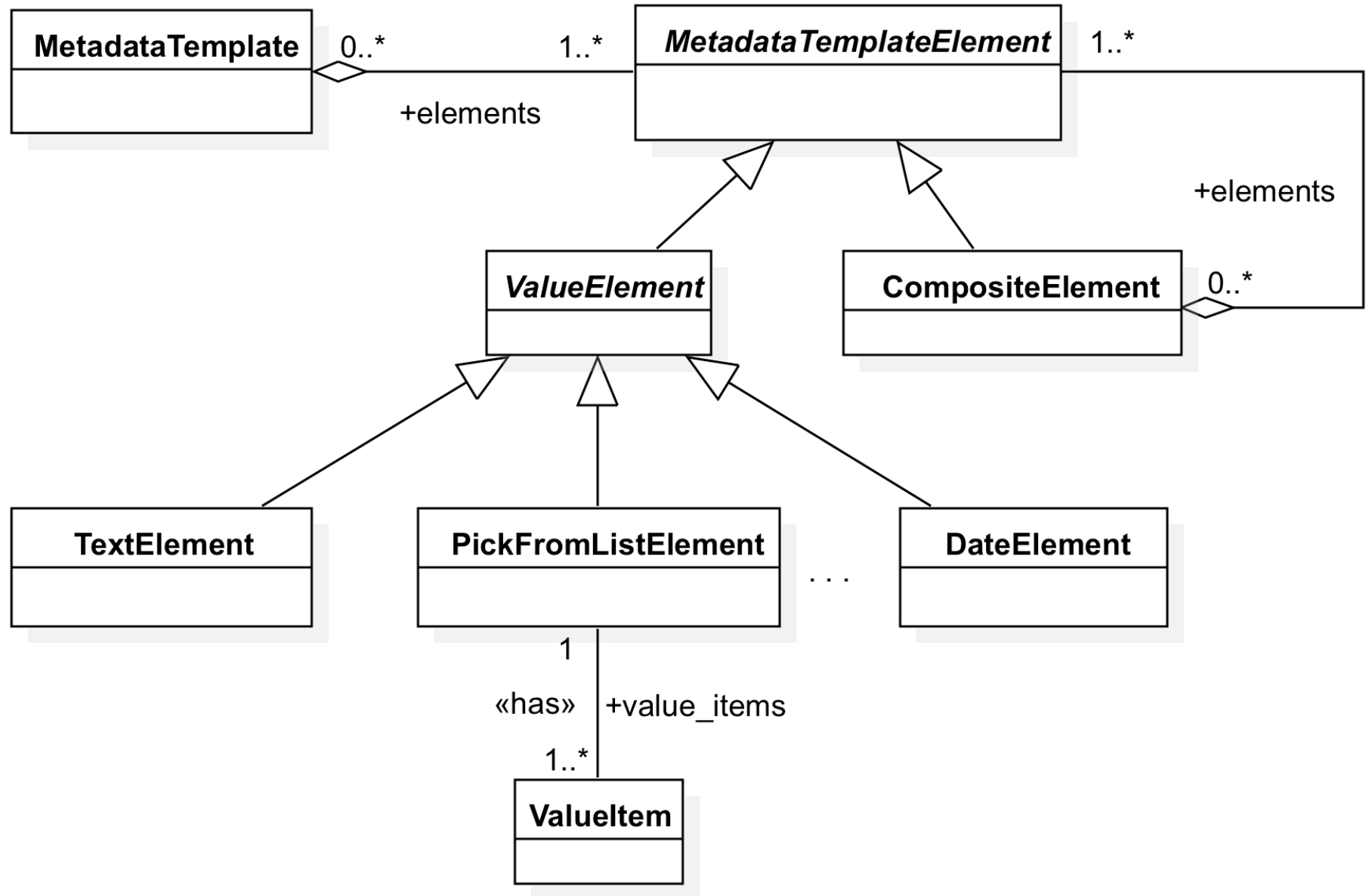
CENTER FOR EXPANDED DATA  
ANNOTATION AND RETRIEVAL

# CEDAR's Information Models

And What To Call Them

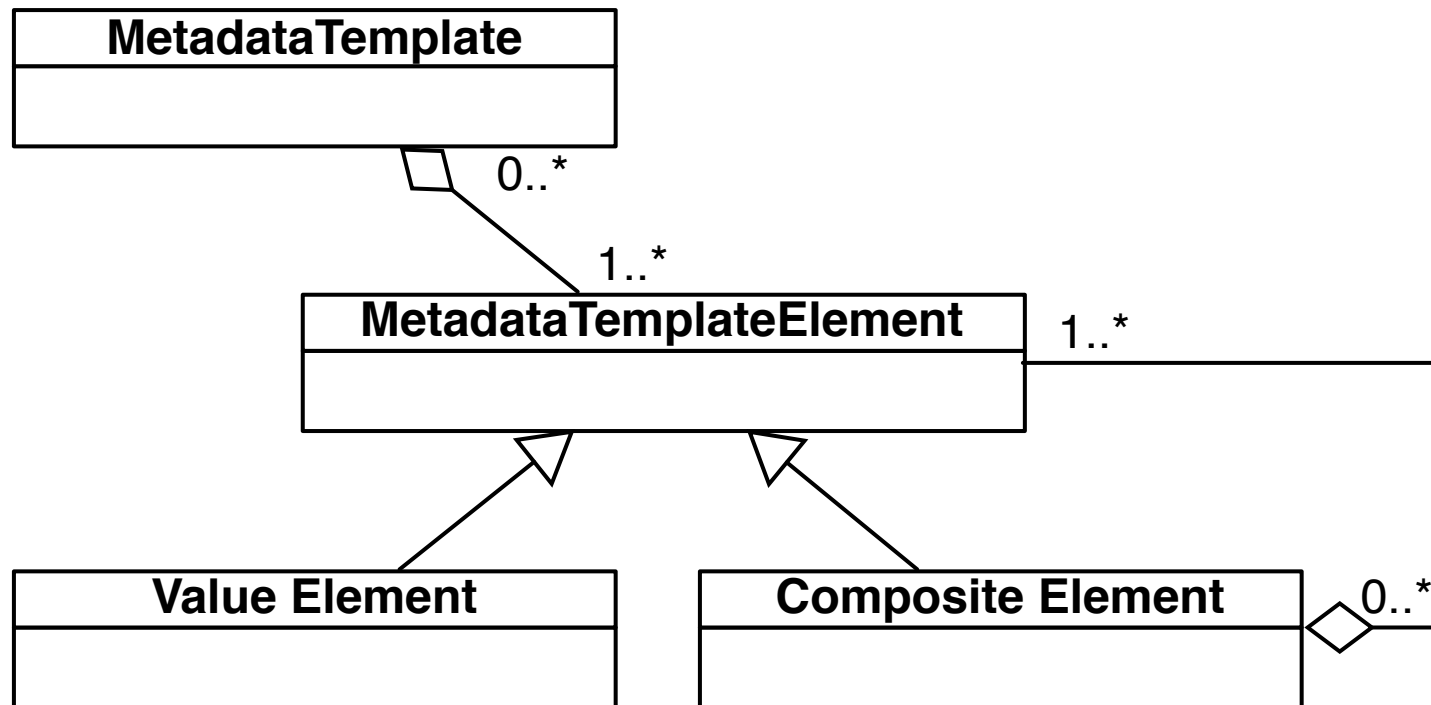
2015.09.27

# CEDAR Repository Element Model



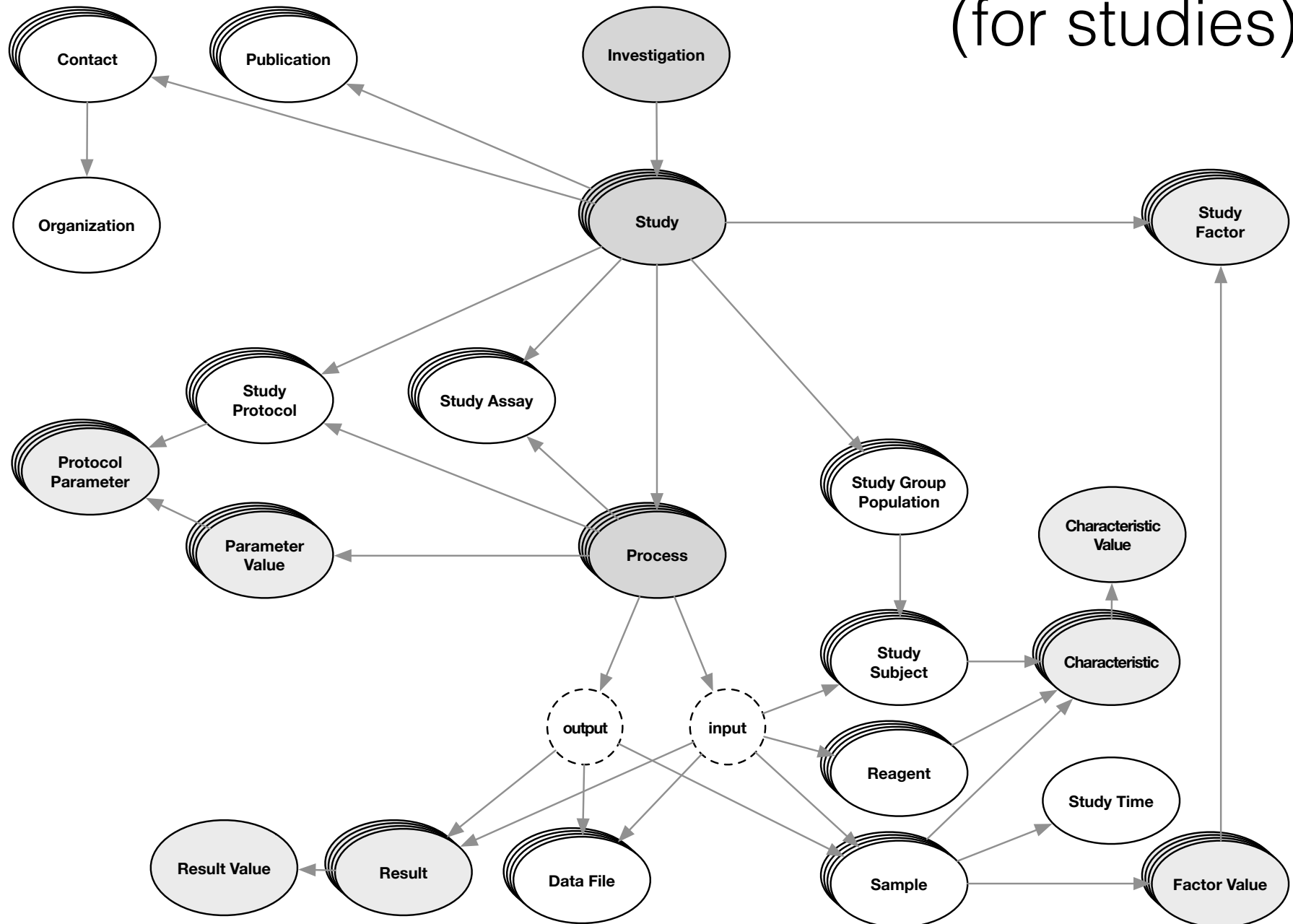
# CEDAR Repository Element Model

Iconic



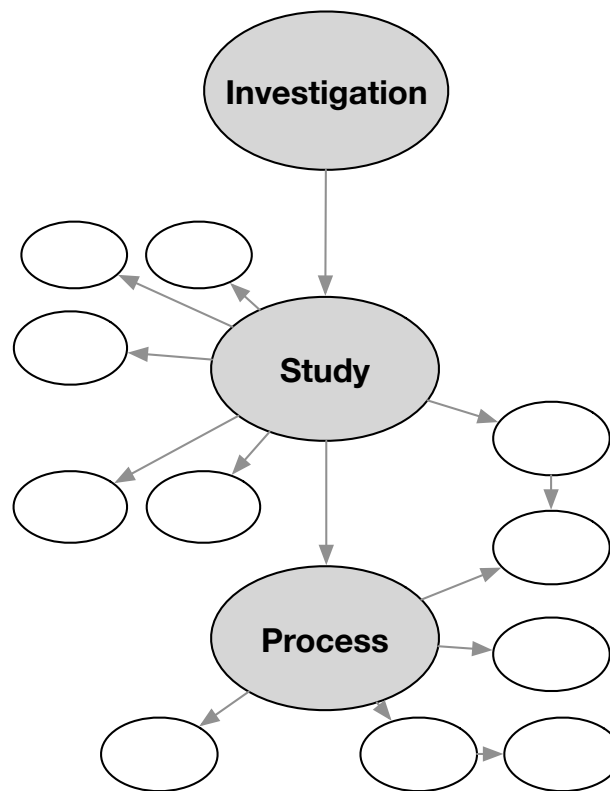
# CEDAR General Domain Model

(for studies)



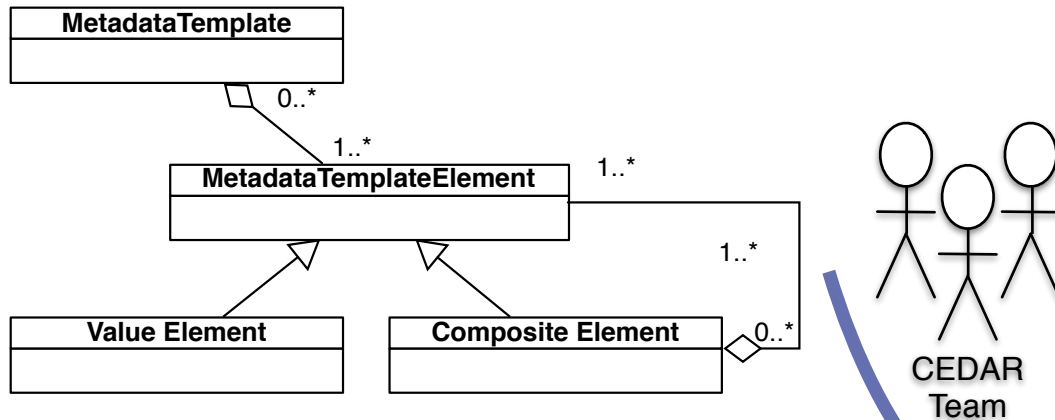
# CEDAR General Domain Model

Iconic

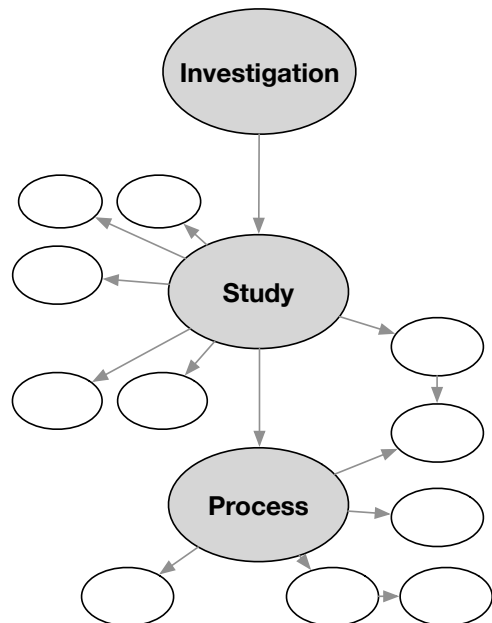


# CEDAR Domain Model Template

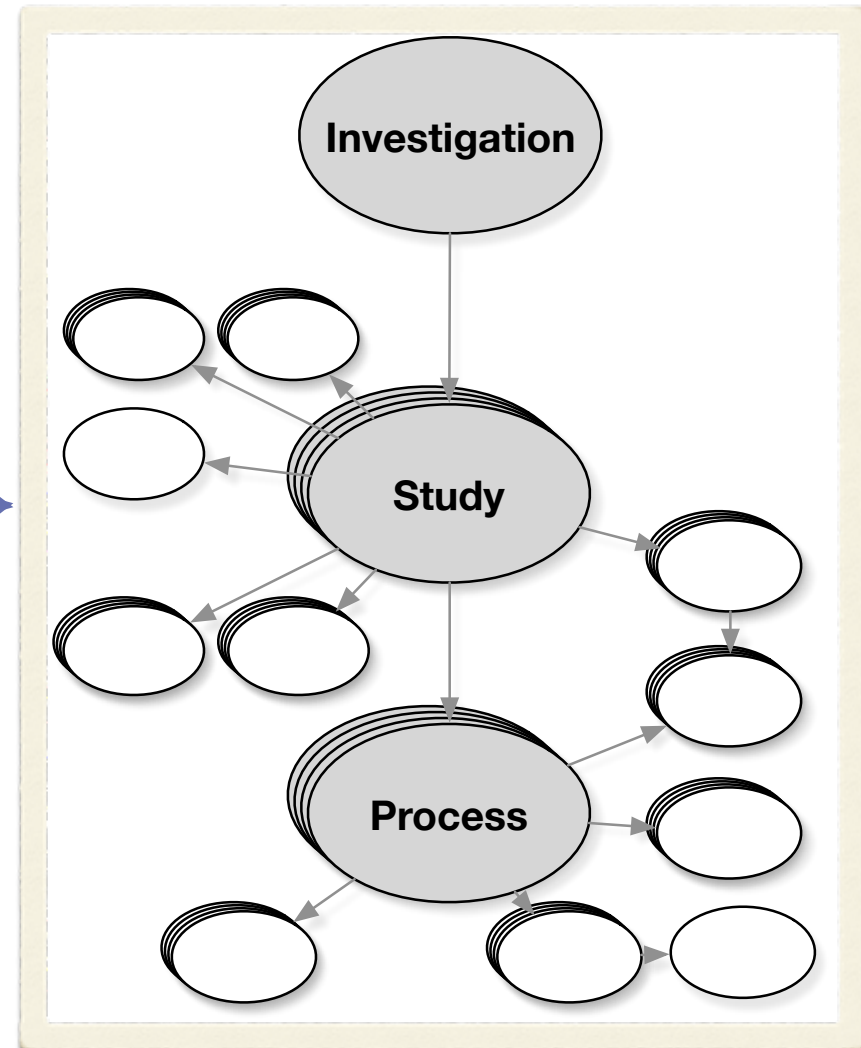
## CEDAR Repository Element Model



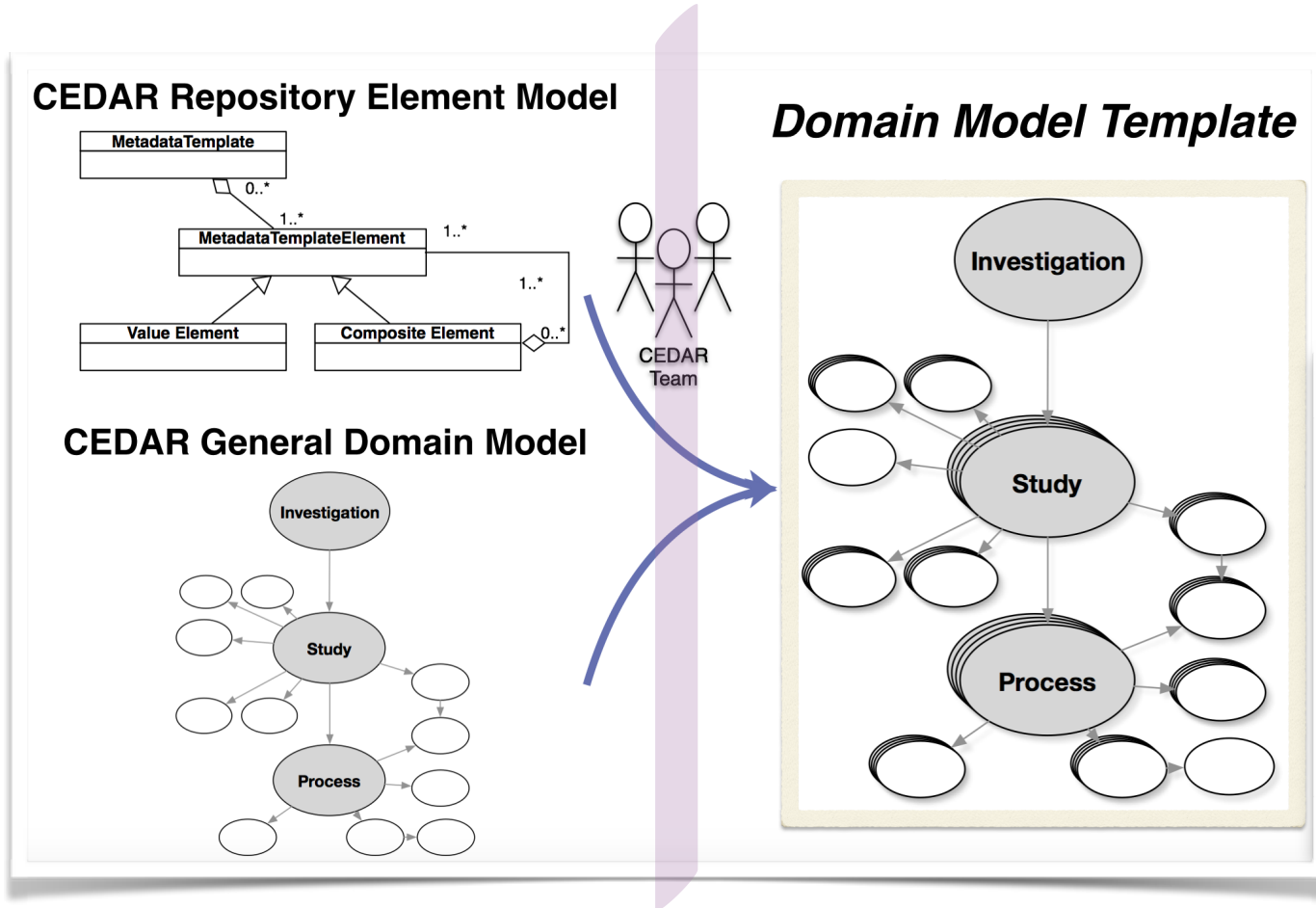
## CEDAR General Domain Model



## *Domain Model Template*



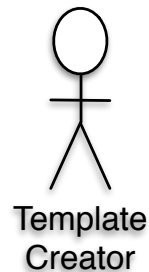
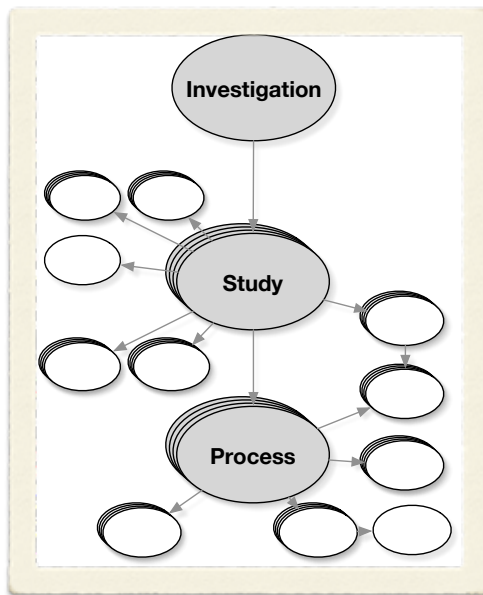
# What's the Difference?



The Domain Model Template  
*instantiates* (implements)  
the concepts in the General Domain Model  
(using the Repository Element Model)

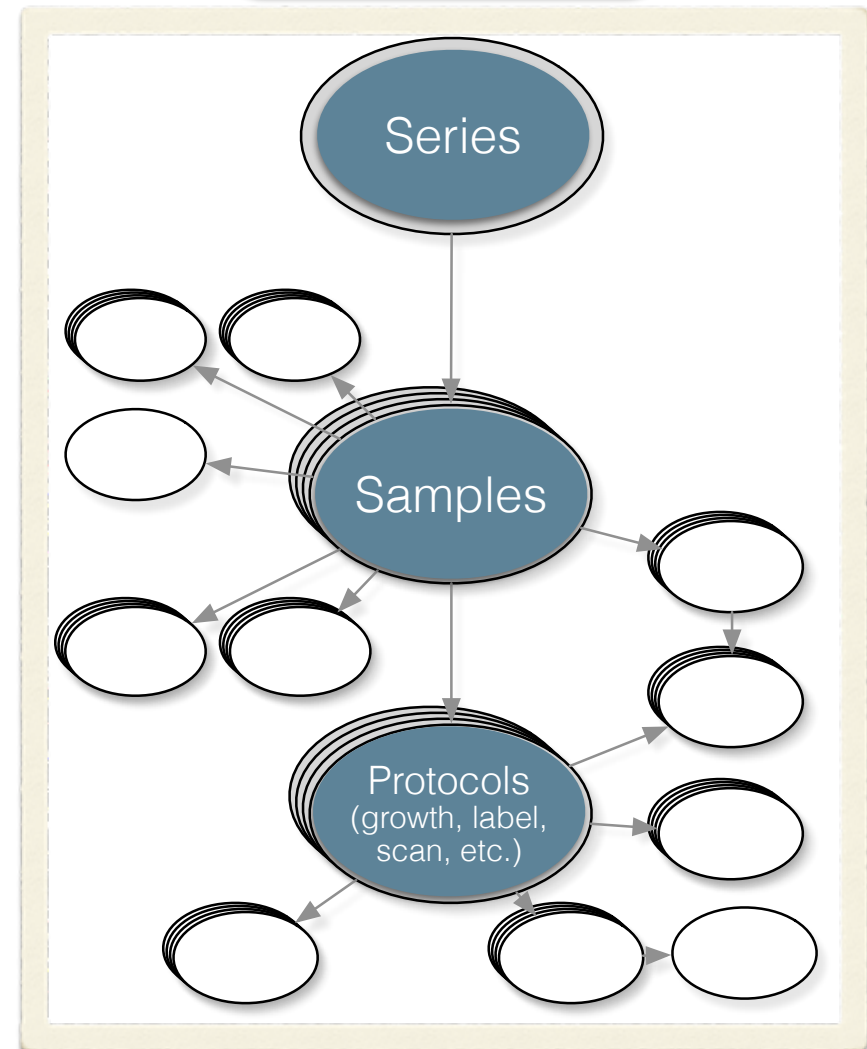
# Creating a Specific Template Model

## *Domain Model Template*



## ***Specific Study Template***

*e.g., for GEO*



## *A Metadata Specification*

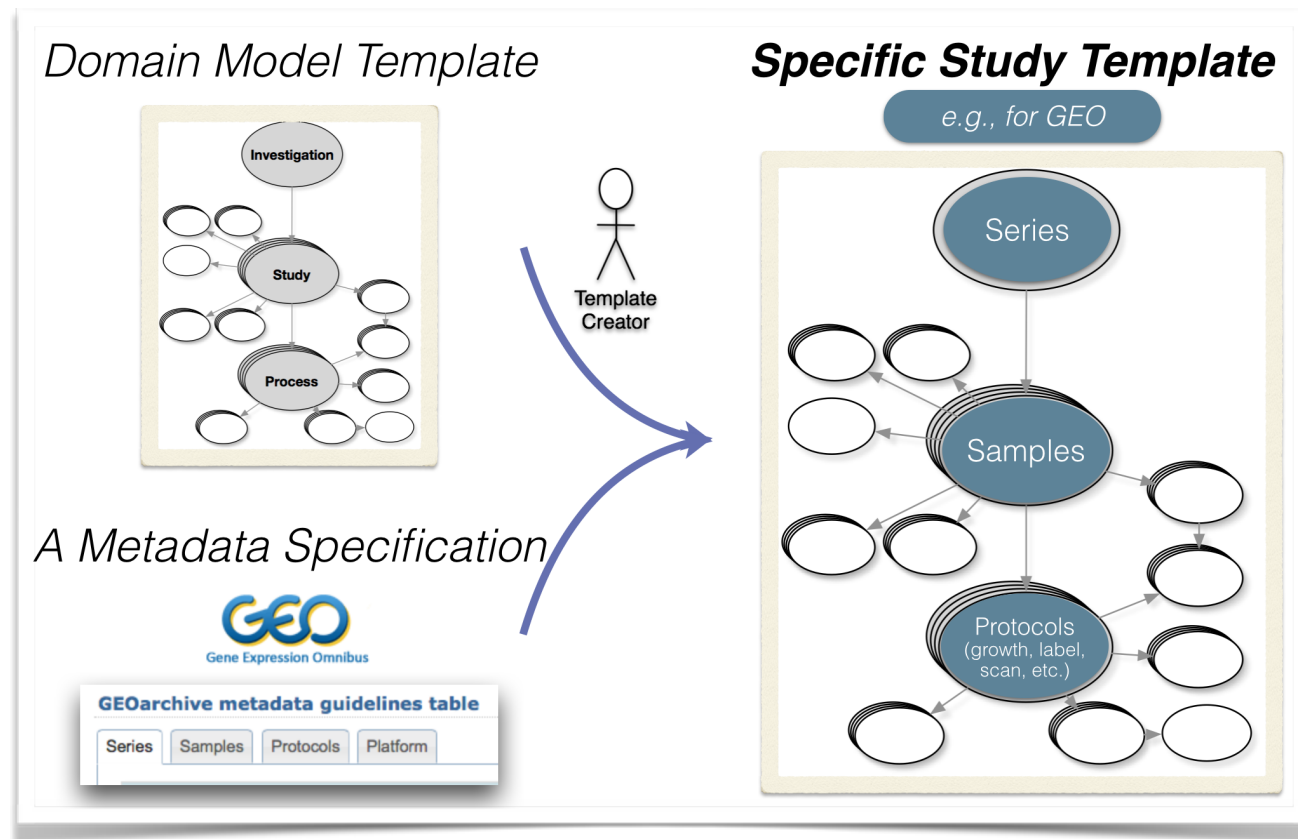


### **GEOarchive metadata guidelines table**

Series	Samples	Protocols	Platform
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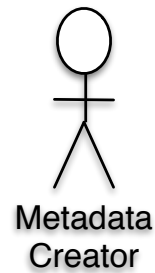
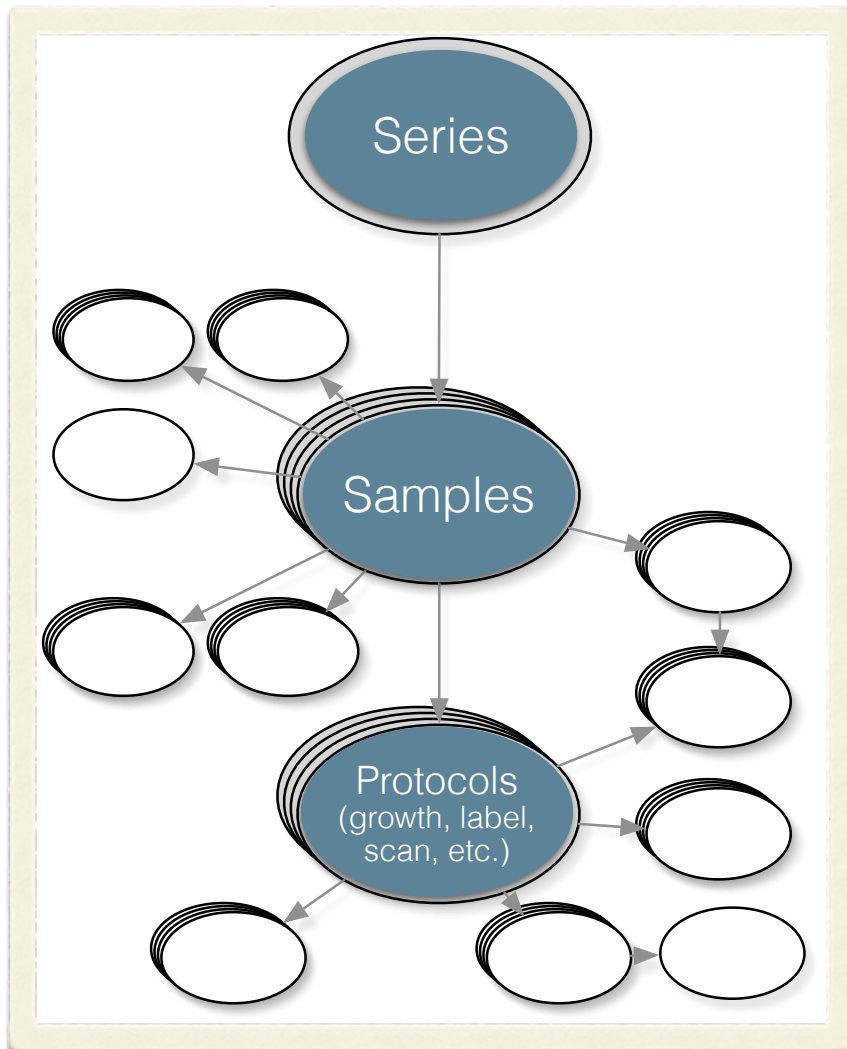
# Creating a Specific Template Model



- The Specific Study Template extends the Domain Model Template
- The entity names follow the metadata specification's language, not the Domain Model terms
- The Specific Study Template constrains its users by specifying the number, roles, and content that are acceptable for each entity

# Fill In Instantiated Data Report

*Specific Study Template*



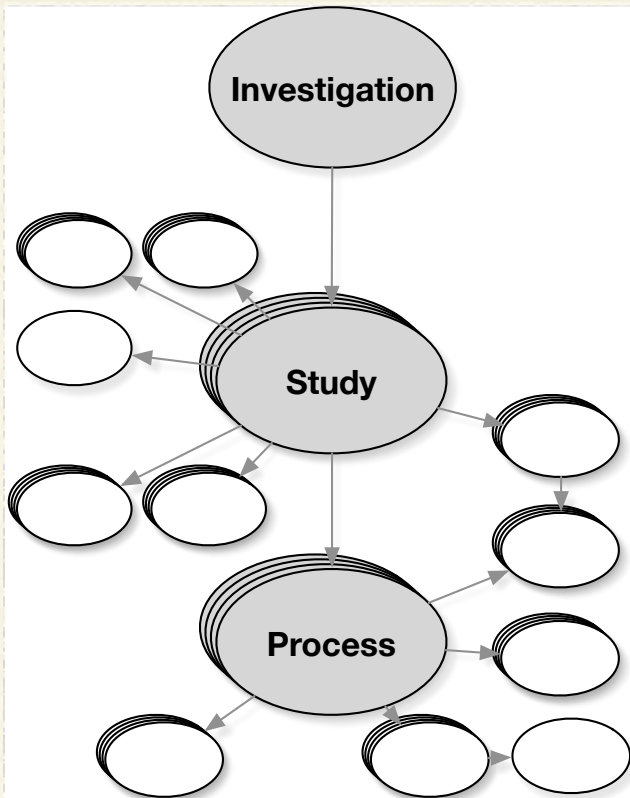
***Instantiated Data Report***

The 'Instantiated Data Report' is a form with the following sections and filled-in data:

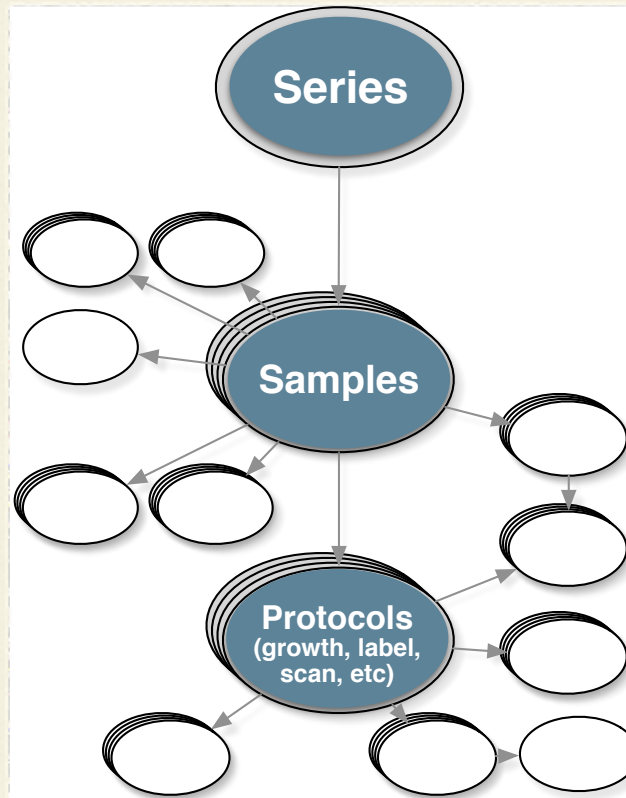
- Series**
  - Label Protocol**: [Empty field]
  - Growth Protocol**: [Empty field]
  - Sample**: [Empty field]
  - Sample Title**: [Empty field]
  - Sample Description**: [Empty field]
  - Sample Principal Investigator**: [Empty field]
  - Sample Name**: [Empty field]
- Series Title**: Vaccination of CD95<sup>-/-</sup> mice and ELISA for detection of influenza-specific antibodies
- Series Description**: Evaluation of the mouse immune response to influenza vaccination. ELISA was used to examine the immune response of mutant mice (MRL/MpJ-Faspr/J (MpJ/lpr), B6.MRL-Faspr/J (B6/lpr), MRL/MpJ (MpJ) and C57BL/6L (B6)) to a single dose of the trivalent 2008 seasonal influenza vaccine
- Principal Investigator**
  - Name**: Mark M. Davis
- Institution**
  - Name**: Stanford University
  - ZIP**: 94305

# Review of Instantiated Models

**Domain Model Template**



**Specific Study Template**

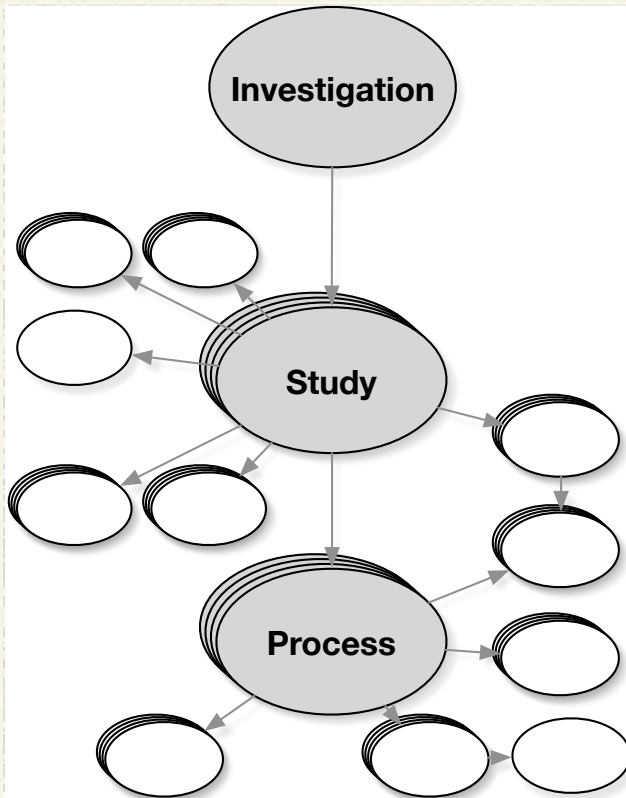


**Instantiated Data Report**

A form representing an instantiated data report. It contains several sections with text and input fields. The top section is labeled "Series" and contains a "Label Protocol" field. Below this is a "Growth Protocol" section. The main section is labeled "Sample" and contains a "Title" field with the text "Vaccination of CD95-/- mice and ELISA for detection of influenza-specific antibodies". Below the title is a "Description" field with a detailed text about the mouse immune response to influenza vaccination. At the bottom is a "Principal Investigator" section with fields for "Name" (Mark M. Davis), "Institution" (Stanford University), and "ZIP" (94305).

How do we represent these in CEDAR?

***(for biomedical studies)***

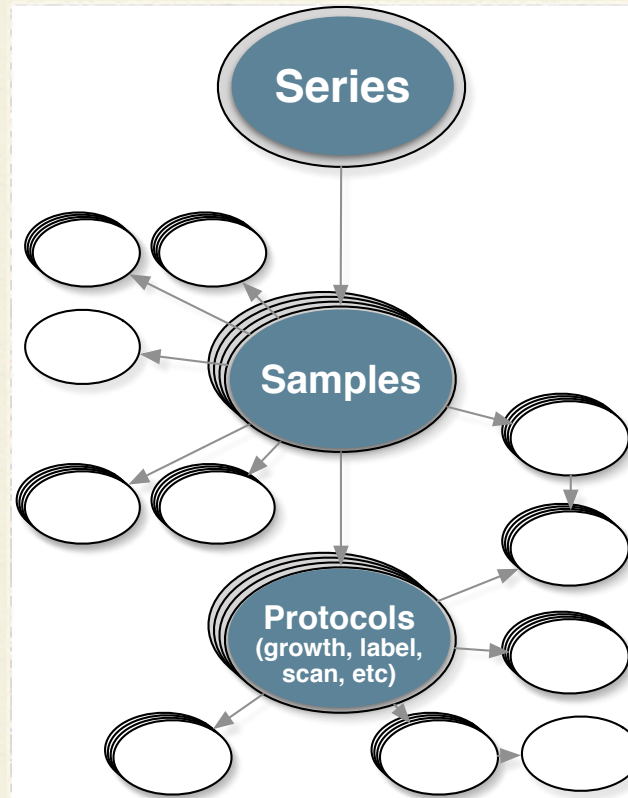


*encoded in a JSON schema:*

```
{
  "$schema": "http://json-schema.org/draft-04/schema#",
  "properties": {
    "investigation": {
      "$schema": "http://json-schema.org/draft-04/
schema#",
      "type": "object",
      "@id": "https://repo.metadatacenter.org/UUID",
      "additionalProperties": true,
      "version": "1.0.0",
      "provenance": {},
      "title": "Investigation Template",
      "description": "JSON-LD/Schema Investigation
Template",

```

*e.g., for GEO*



***encoded in a JSON schema:***

```
{
  "$schema": "http://json-schema.org/draft-04/schema#",
  "properties": {
    "investigation": {
      "$schema": "http://json-schema.org/draft-04/
schema#",
      "type": "object",
      "@id": "https://repo.metadatacenter.org/UUID",
      "additionalProperties": true,
      "version": "1.0.0",
      "provenance": {},
      "title": "Investigation Template",
      "description": "JSON-LD/Schema Investigation
Template",

```

**for a GEO series**

**Series**

**Label Protocol**

**Growth Protocol**

**Sample**

**Series**

Title

Vaccination of CD95-/- mice and ELISA for detection of influenza-specific antibodies

Description

Evaluation of the mouse immune response to influenza vaccination. ELISA was used to examine the immune response of mutant mice (MRL/MpJ-Faspr/J (MpJ/pr), B6.MRL-Faspr/J (B6/pr), MRL/MpJ (MpJ) and C57BL/6L (B6)) to a single dose of the trivalent 2008 seasonal influenza vaccine

Principal Investigator

Name

Mark M. Davis

Institution

Name

Stanford University

ZIP

94305

Title

Evaluation of the mouse immune response to influenza vaccination

Description

Evaluation of the mouse immune response to influenza vaccination

Evaluation

Evaluation of the mouse immune response to influenza vaccination

Title

Evaluation of the mouse immune response to influenza vaccination

Description

Evaluation of the mouse immune response to influenza vaccination

Evaluation

Evaluation of the mouse immune response to influenza vaccination

Description

Evaluation of the mouse immune response to influenza vaccination

Evaluation

Evaluation of the mouse immune response to influenza vaccination

**encoded in JSON:**

```
"investigation": {
  "schemaID": "https://repo.metadatacenter.org/UUID"
  "id": "https://repo.metadatacenter.org/UUID",
  "@type": "https://repo.metadatacenter.org/model/
Investigation",
  "@context": {
    "model": "https://repo.metadatacenter.org/model/"
```

*following a JSON schema:*

```
{
  "$schema": "http://json-schema.org/draft-04/schema#",
  "properties": {
    "investigation": {
      "$schema": "http://json-schema.org/draft-04/
schema#",
      "type": "object",
      "@id": "https://repo.metadatacenter.org/UUID",
      "additionalProperties": true,
      "version": "1.0.0",
      "provenance": {},
      "title": "Investigation Template",
      "description": "JSON-LD/Schema Investigation
Template",

```