

# Setting up an ISA compatible FAIR Data Point instance

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**Abstract:** This document describes how to setting up a FAIR Data Point (FDP) locally to host ISA metadata. The setting up of a FDP hosting ISA metadata generally implemented via two steps. The first step is to deploy the FDP. A local deployment is used in this case. The second step is to configure the FDP so it can host ISA metadata concepts, such as Investigation, Study, Assay and others.

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## Step 1. FDP Local Deployment

FAIR Data Point is distributed in Docker images. In our case, a local deployment is used. We follow the instruction at

<https://fairdatapoint.readthedocs.io/en/latest/deployment/local-deployment.html>

A more complete introduction of FDP can be found at

<https://fairdatapoint.readthedocs.io/en/latest/pdf/>

## Step 2. Deal with ISA metadata

After successfully installed FDP, the next step is to submit metadata to it (in our case, the ISA metadata). As the FDP is DCAT compatible, to host ISA metadata, new resources and shapes should be created to make the FDP ISA compatible.

### 2.1 Define new resources (investigation and study) in FDP

Specifically, we need to define new resources and shapes for Investigation and Study. FDP's Default resource description layers (metadata) are: 1) Data Repository, 2) Catalog, 3) Resource(Dataset), 4) Distribution, as shown in figure 1:

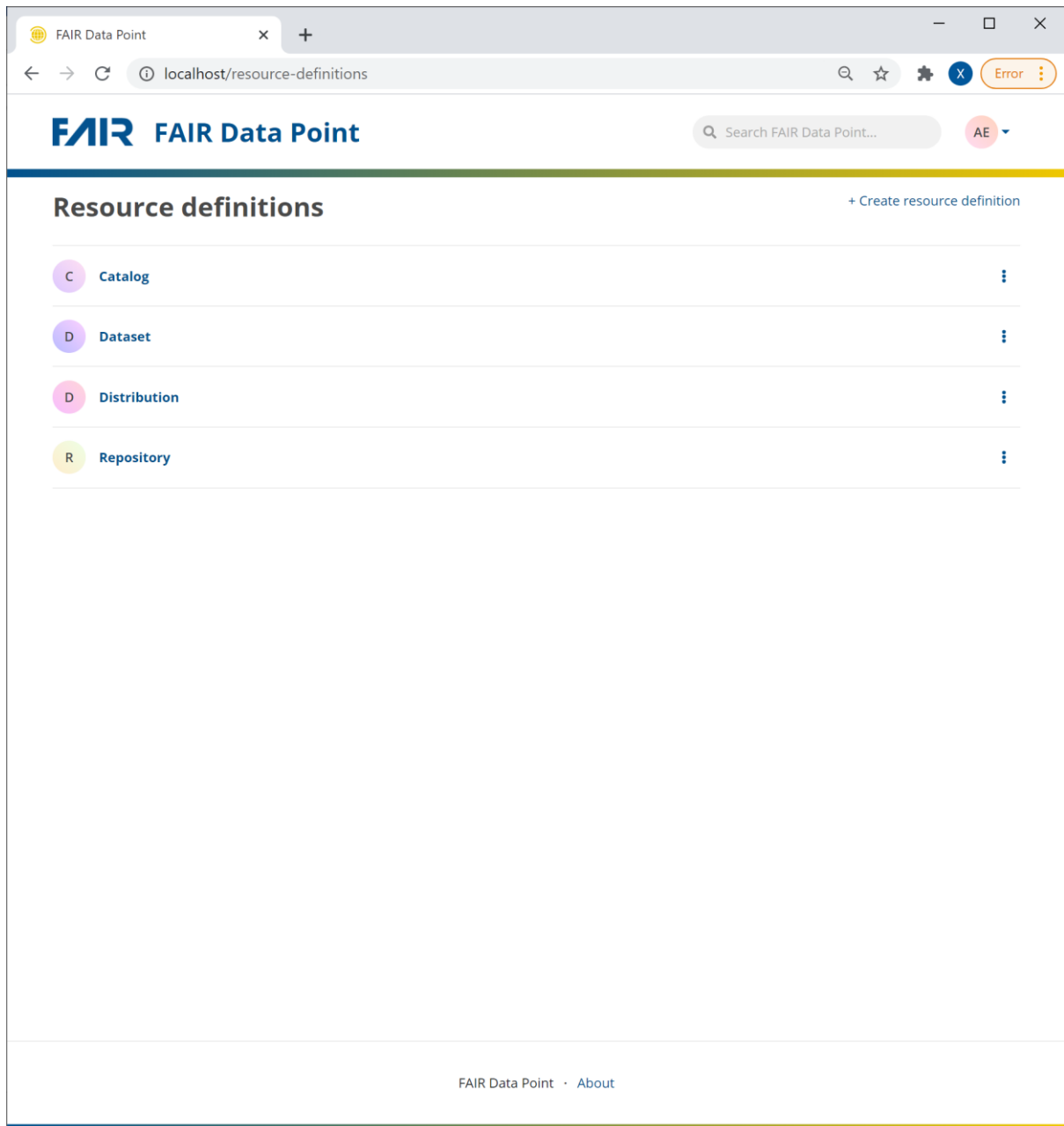


Figure 1 : Resources in default setting.

We add two new resources Investigation and Study, by clicking the “Create resource definition” link at the up right of the page.

First, create Study, fill in the form as figure 2 indicates.

The screenshot shows a web browser window with the address bar displaying `localhost/resource-definitions/705e4143-cac4-461d-998e-76cd8f69148e`. The page header features the FAIR Data Point logo and a search bar. The breadcrumb trail indicates the current location is `Resource definitions / Edit Study`. The main heading is **Edit Study**. The form contains several sections: **Name** with the value `Study`; **URL Prefix** with the value `study`; **Target Class URIs** with two entries: `http://www.w3.org/ns/dcat#Resource` and `http://purl.org/biosemantics-lumc/ontologies/dcat-extension/Study`; **Children** with a `+ Add` button; and **External links** with a `+ Add` button. A `Save` button is located at the bottom of the form.

localhost/resource-definitions/705e4143-cac4-461d-998e-76cd8f69148e

FAIR Data Point

Search FAIR Data Point...

AE

Resource definitions / Edit Study

## Edit Study

**Name**

Study

**URL Prefix**

study

**Target Class URIs**

- http://www.w3.org/ns/dcat#Resource
- http://purl.org/biosemantics-lumc/ontologies/dcat-extension/Study

**Children**

+ Add

**External links**

+ Add

Save

Figure 2: Create Study

For creating Investigation, fill in the form with the content shown in figure 3.

localhost/resource-definitions/9ee72a44-d61f-4b2c-9cb0-e695d789afa4

## Edit Investigation

**Name**  
Investigation

**URL Prefix**  
investigation

**Target Class URIs**

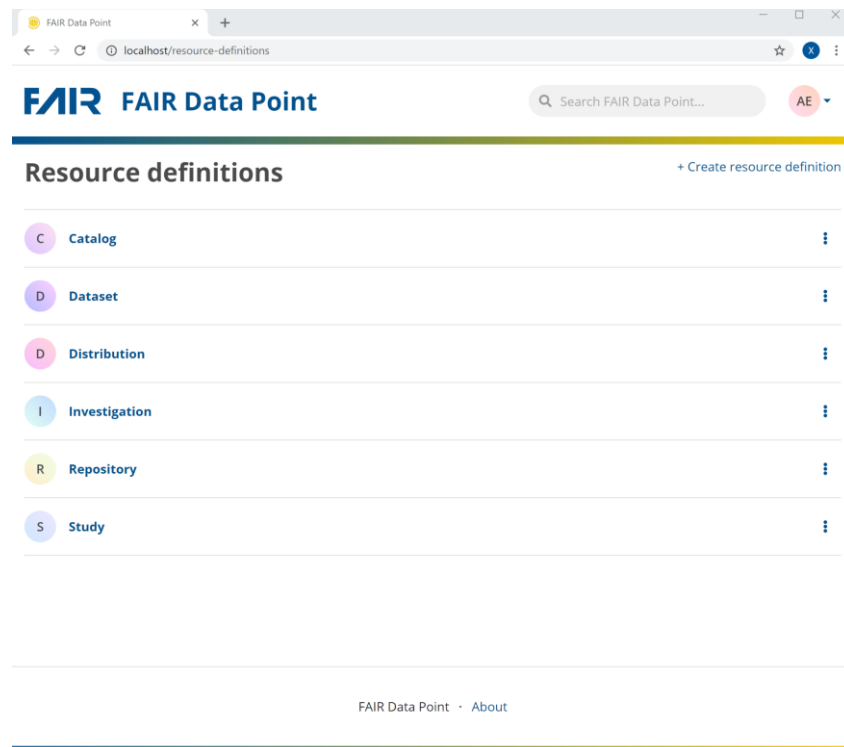
- http://www.w3.org/ns/dcat#Resource
- http://purl.org/biosemantics-lumc/ontologies/dcat-extension/Investigation

**Children**

- Child Resource** ✖  
Study
- Child Relation URI**  
http://purl.org/biosemantics-lumc/ontologies/dcat-extension/Study
- Child List View Title**  
Studies
- Child List View Tags URI**  
http://purl.org/dc/terms/title
- Child List View Metadata**  
[+ Add](#)

Figure 3: Create Investigation.

After creation of Investigation and Study, the resources page in FDP looks like figure 4:



*Figure 4: New resources defined corresponding to Investigation and Study*

## 2.2 Define shapes for Investigation and Study

The next step is to define shapes for Investigation and Study. By choosing the SHALC shapes when clicking the user icon at the up right of the page, as shown in figure 5.

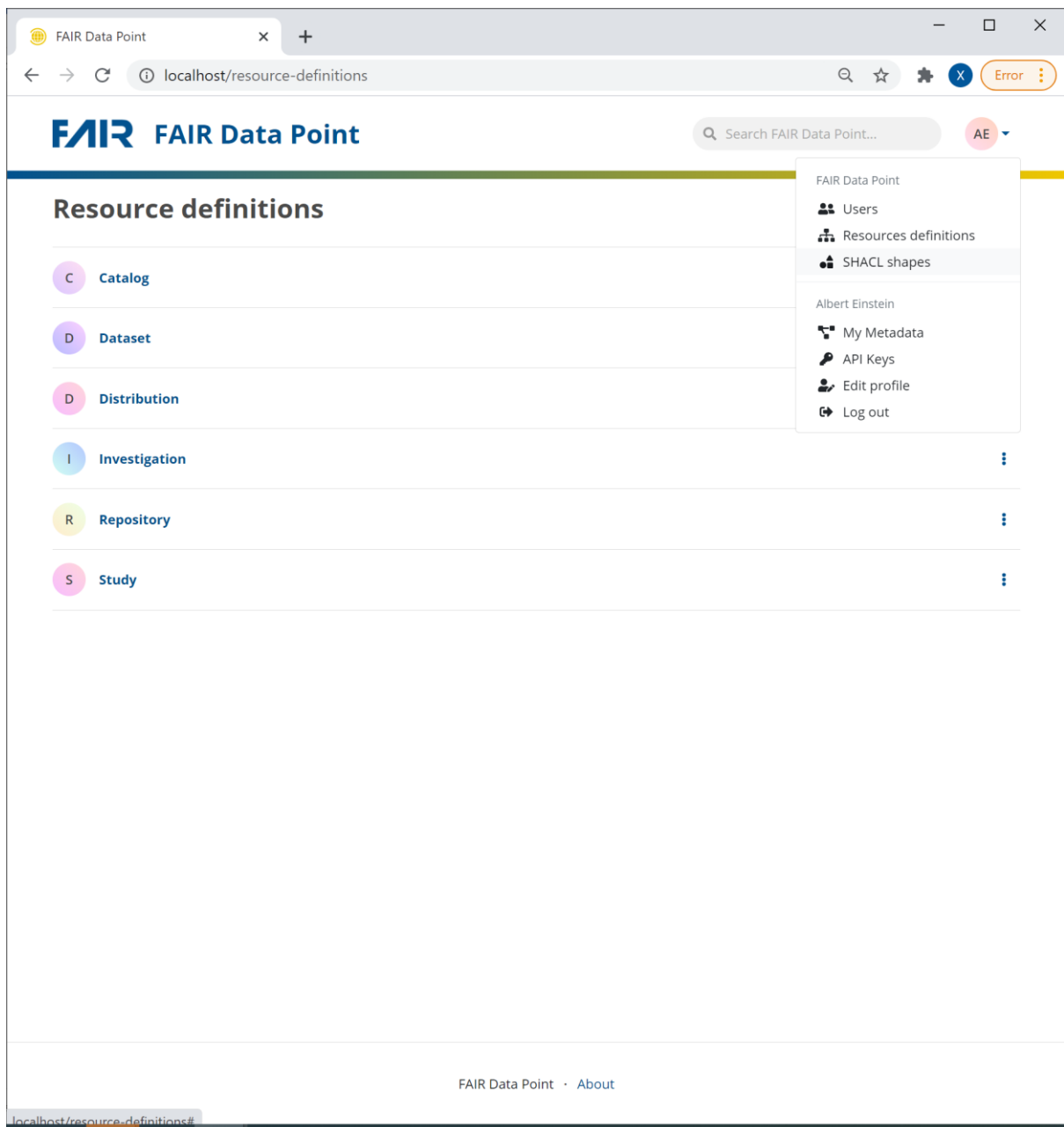


Figure 5: Choose SHALC shapes from the menu.

The default shapes page looks like figure 6:



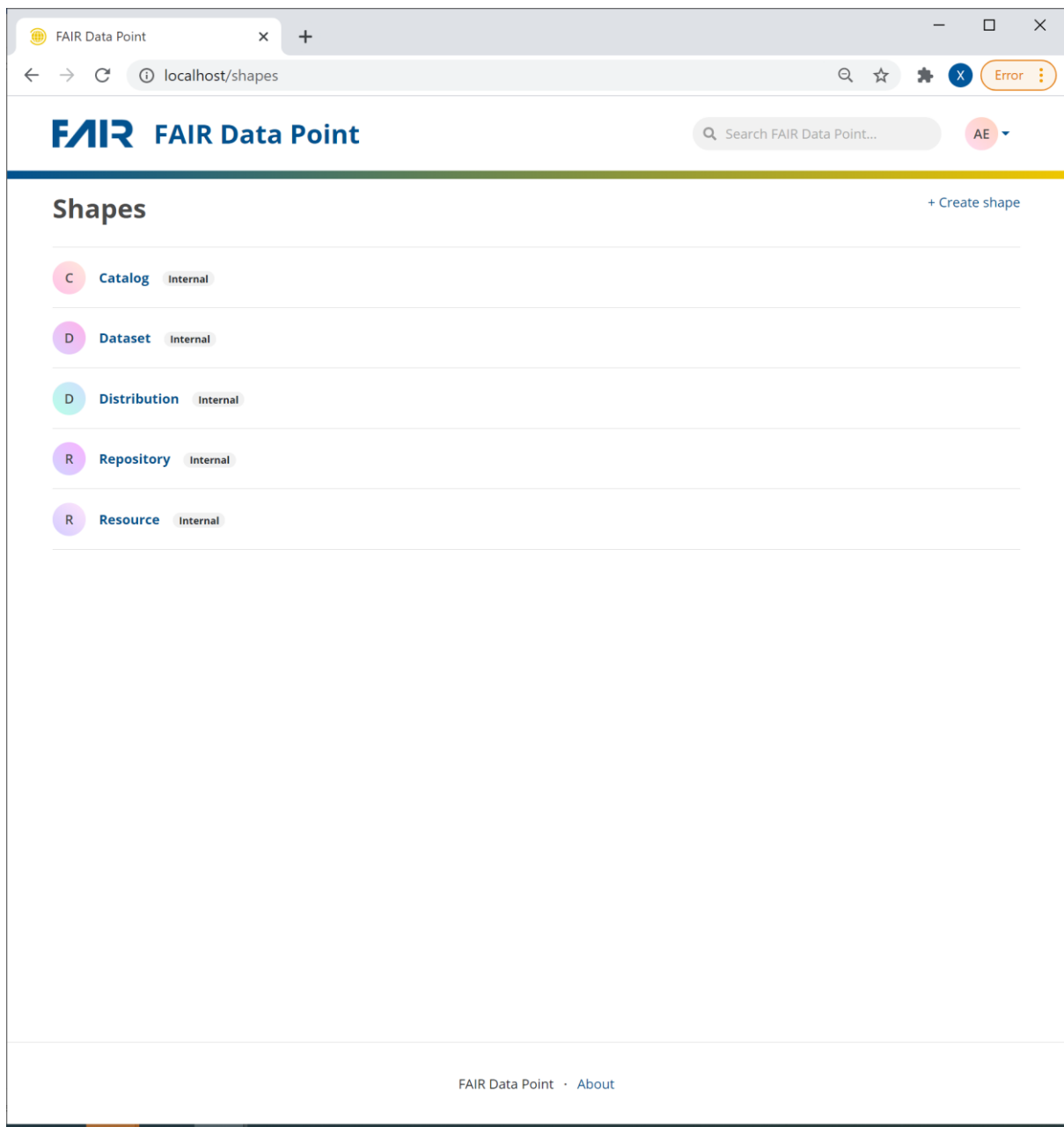


Figure 6: Default shapes page.

Click “Create shape” at the top right, a form will be displayed, as shown in figure 7,

The screenshot shows a web browser window with the address bar displaying 'localhost/shapes/create'. The page header includes the 'FAIR Data Point' logo and a search bar. The main content area is titled 'Create shape' and contains two input fields: 'Name' and 'Definition'. The 'Name' field is a single-line text input, and the 'Definition' field is a larger multi-line text input. Below these fields is a blue 'Create shape' button. The footer of the page contains the text 'FAIR Data Point · About'.

FAIR Data Point

Search FAIR Data Point...

Shapes / Create shape

## Create shape

Name

Name

Definition

Create shape

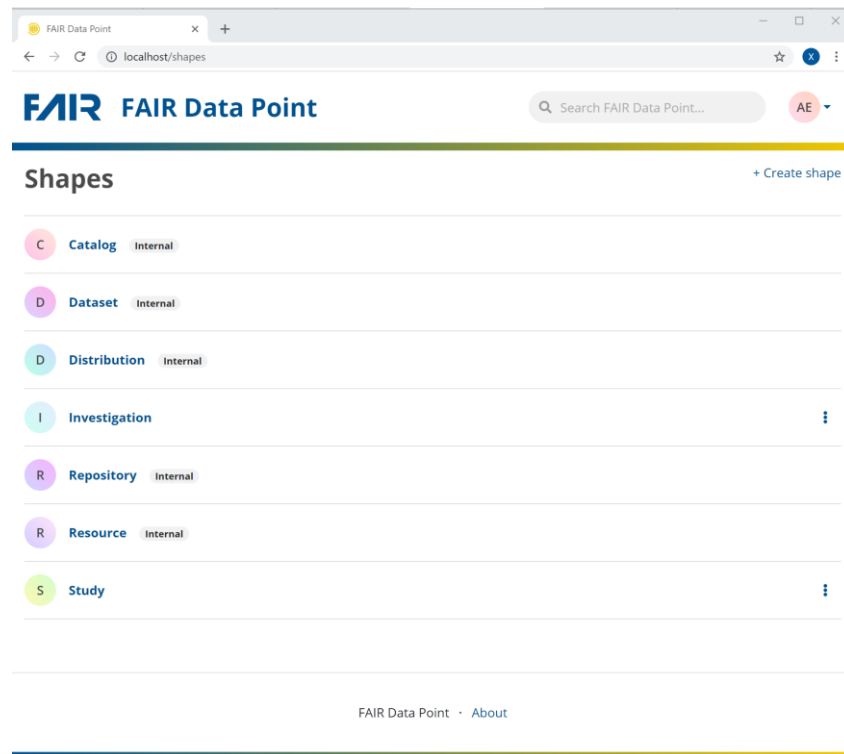
FAIR Data Point · About

Figure 7: Creation of shape

For Investigation, fill in the Name “Investigation”, and fill in Definition with the shape of Investigation. The detailed shape definition of Investigation can be found in Appendix (A.1).

For Study, repeat the step, and fill in the form with name “Study” and Definition with the shape of Study. The detailed shape definition of Study can be found in Appendix (A.2).

Then, the two new created shapes Investigation and Study can be seen on the shapes page, as shown in figure 8.



*Figure 8: New created shapes Investigation and Study*

To display Investigation at the home page, it is needed to set Investigation as child of Repository. To do that, edit the Repository from the Resource definition page, add a the Investigation as a child of Repository, as figure 9 indicates.

FAIR Data Point

localhost/resource-definitions/77aad6a-0136-4c6e-88b9-07ffccd0ee4c

Search FAIR Data Point...

Resource definitions / Edit Repository

### Edit Repository

Name  
Repository

URL Prefix  
URL prefix

Target Class URIs

- http://www.w3.org/ns/dcat#Resource
- http://www.re3data.org/schema/3-0#Repository

Children

- Child Resource** ✖  
Catalog  
  
Child Relation URI  
http://www.re3data.org/schema/3-0#dataCatalog  
  
Child List View Title  
Catalogs  
  
Child List View Tags URI  
http://www.w3.org/ns/dcat#themeTaxonomy  
  
Child List View Metadata  
[+ Add](#)
- Child Resource** ✖  
Investigation  
  
Child Relation URI  
http://purl.org/biosemantics-lumc/ontologies/dcat-extension/investigation  
  
Child List View Title  
Investigations  
  
Child List View Tags URI  
http://www.w3.org/ns/dcat#theme  
  
Child List View Metadata  
[+ Add](#)

[+ Add](#)

External links  
[+ Add](#)

[Save](#)

Figure 9: Add Investigation as child of Repository.

With all these done, we can now create investigation, click “create” button on the FDP home page, a page for create investigation will appear.

After successfully create an Investigation, we can continue create Studies under the Investigation by clicking the “Create” button.

The screenshot shows the FAIR Data Point web application. At the top, there's a browser address bar with the URL `localhost/investigation/2c486a97-e739-43d4-8100-2743a8f785c6`. The FAIR Data Point logo is on the left, and a search bar and user profile (AE) are on the right. Below the header, the page title is "My FAIR Data Point / Pertussis Correlates of Protection Eur...".

The main content area features the investigation "Pertussis Correlates of Protection Europe". It includes a description: "The PERISCOPE (PERTussis Correlates of Protection Europe) consortium brings together internationally renowned scientists with many years of experience in Bordetella pertussis (Bp) research, clinical trials, bioinformatics, immunology and public health. PERISCOPE combines two major industrial partners with public researchers from academic and public health institutes and SMEs with expertise in clinical trials, vaccinology, immunology, molecular microbiology, (human) challenge models and bioinformatics." Below this is a "Studies" section with a "+ Create" button. Two studies are listed: "IMA1601" and "PHY1604", each with a "Created" and "Modified" date of "27-05-2021".

On the right side, there's a metadata panel with the following information:
 

- Owner: [User Icon]
- Edit: [Edit Icon]
- Settings: [Settings Icon]
- Delete: [Delete Icon]
- Metadata Issued: 27-05-2021
- Metadata Modified: 27-05-2021
- Version: 1.0
- Language: en
- License: cc-by-nc-nd3.0
- Download RDF: [ttl](#), [rdf+xml](#), [json-ld](#)

At the bottom of the page, there's a footer with the text "FAIR Data Point · About".

Figure 10: The Investigation and Study created.

## Appendix

### A.1: Shape of Investigation

```

@prefix :          <http://fairdatapoint.org/> .
@prefix dash:      <http://datashapes.org/dash#> .
@prefix dcat:      <http://www.w3.org/ns/dcat#> .
@prefix dct:       <http://purl.org/dc/terms/> .
@prefix foaf:      <http://xmlns.com/foaf/0.1/> .
@prefix sh:        <http://www.w3.org/ns/shacl#> .
@prefix dcat-ext:  <http://purl.org/biosemantics-
lumc/ontologies/dcat-extension/> .
  
```

```
:InvestigationShape a sh:NodeShape ;
  sh:targetClass dcat-ext:Investigation ;
  sh:property [
    sh:path dct:issued ;
    sh:datatype xsd:dateTime ;
    sh:maxCount 1 ;
    dash:viewer dash:LiteralViewer ;
  ], [
    sh:path dct:modified ;
    sh:datatype xsd:dateTime ;
    sh:maxCount 1 ;
    dash:viewer dash:LiteralViewer ;
  ], [
    sh:path foaf:homePage ;
    sh:nodeKind sh:IRI ;
    sh:maxCount 1 ;
    dash:editor dash:URIEditor ;
    dash:viewer dash:LabelViewer ;
  ], [
    sh:name "Investigation PubMed ID" ;
    sh:path dcterms:identifier ;
    sh:nodeKind sh:IRI ;
    sh:maxCount 2 ;
    dash:editor dash:URIEditor ;
    dash:viewer dash:LabelViewer ;
  ],
[
  sh:name "Investigation Publication DOI" ;
  sh:path dcterms:identifier ;
  sh:nodeKind sh:IRI ;
  sh:maxCount 2 ;
  dash:editor dash:URIEditor ;
  dash:viewer dash:LabelViewer ;
],
```

```
[
  sh:name "Investigation Publication Author List" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
],
[
  sh:name "Investigation Publication Title" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
],
[
  sh:name "Investigation Publication Status" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
],
[
  sh:name "Investigation Publication Status Term Accession
Number" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
],
[
  sh:name "Investigation Publication Status Term Source REF" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
]
```

```
],
[ sh:name "Investigation Person Last Name" ;
  sh:path foaf:lastName ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],
[sh:name "Investigation Person First Name" ;
  sh:path foaf:firstName ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],
[
  sh:name "Investigation Person Mid Initials" ;
  sh:path foaf:firstName ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],

[
  sh:name "Investigation Person Email" ;
  sh:path foaf:OnlineAccount ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],

[
  sh:name "Investigation Person Phone" ;
```



```
    sh:path foaf:phone ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 1 ;
    dash:editor dash:TextFieldEditor ;
    dash:viewer dash:LabelViewer ;
  ],

  [
    sh:name "Investigation Person Fax" ;
    sh:path foaf:phone ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 1 ;
    dash:editor dash:TextFieldEditor ;
    dash:viewer dash:LabelViewer ;
  ],

  [
    sh:name "Investigation Person Address" ;
    sh:path foaf:phone ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 1 ;
    dash:editor dash:TextFieldEditor ;
    dash:viewer dash:LabelViewer ;
  ],

  [
    sh:name "Investigation Person Affiliation" ;
    sh:path foaf:Organization ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 1 ;
    dash:editor dash:TextFieldEditor ;
    dash:viewer dash:LabelViewer ;
  ],

  [
    sh:name "Investigation Person Roles" ;
```

```

sh:path foaf:Organization ;
sh:nodeKind sh:Literal ;
sh:maxCount 1 ;
dash:editor dash:TextFieldEditor ;
dash:viewer dash:LabelViewer ;
],

[
  sh:name "Investigation Person Roles Term Accession Number" ;
  sh:path foaf:Organization ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],

[
  sh:name "Investigation Person Roles Term Source REF" ;
  sh:path foaf:Organization ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],
[
  sh:path dcat:themeTaxonomy ;
  sh:nodeKind sh:IRI ;
  dash:viewer dash:LabelViewer ;
] .

```

## A.2: Shape definition of Study

```

@prefix :      <http://fairdatapoint.org/> .
@prefix dash:  <http://datashapes.org/dash#> .
@prefix dcat:  <http://www.w3.org/ns/dcat#> .

```

```
@prefix dct:      <http://purl.org/dc/terms/> .
@prefix sh:       <http://www.w3.org/ns/shacl#> .
@prefix dcat-ext: <http://purl.org/biosemantics-
lumc/ontologies/dcat-extension/> .
@prefix sio:      <http://semanticscience.org/resource/> .
```

```
:StudyShape a sh:NodeShape ;
  sh:targetClass dcat-ext:Study ;
  sh:property [
    sh:path dct:issued ;
    sh:datatype xsd:dateTime ;
    sh:maxCount 1 ;
    dash:editor dash:DatePickerEditor ;
    dash:viewer dash:LiteralViewer ;
  ], [
sh:path sio:SIO_000001 ;
sh:nodeKind sh:IRI ;
sh:name "is related to" ;
sh:maxCount 1 ;
dash:editor dash:URIEditor ;
dash:viewer dash:LabelViewer ;
],
[
  sh:name "Study PubMed ID" ;
  sh:path dcterms:identifier ;
  sh:nodeKind sh:IRI ;
  sh:maxCount 2 ;
  dash:editor dash:URIEditor ;
  dash:viewer dash:LabelViewer ;
],
[
  sh:name "Study Publication DOI" ;
  sh:path dcterms:identifier ;
  sh:nodeKind sh:IRI ;
  sh:maxCount 2 ;
```

```
dash:editor dash:URIEditor ;
dash:viewer dash:LabelViewer ;
],
[
  sh:name "Study Publication Author List" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
],
[
  sh:name "Study Publication Title" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
],
[
  sh:name "Study Publication Status" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
],
[
  sh:name "Study Publication Status Term Accession Number" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 2 ;
  dash:editor dash:TextFieldEditor ;
],
[
  sh:name "Study Publication Status Term Source REF" ;
  sh:path dcterms:title ;
  sh:nodeKind sh:Literal ;
```

```
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
  ] ,
  [
    sh:name "Study Assay File Name" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
  ] ,
  [
    sh:name "Study Assay Measurement Type" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
  ] ,
  [
    sh:name "Study Assay Measurement Type Term Source REF" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
  ] ,
  [
    sh:name "Study Assay Measurement Type Term Accession Number" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
  ] ,
  [
    sh:name "Study Assay Technology Type" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
```

```
sh:maxCount 2 ;
dash:editor dash:TextFieldEditor ;
] ,
[
sh:name "Study Assay Technology Type Term Accession Number" ;
sh:path dcterms:title ;
sh:nodeKind sh:Literal ;
sh:maxCount 2 ;
dash:editor dash:TextFieldEditor ;
] ,
[
sh:name "Study Assay Technology Type Term Source REF" ;
sh:path dcterms:title ;
sh:nodeKind sh:Literal ;
sh:maxCount 2 ;
dash:editor dash:TextFieldEditor ;
] ,
[
sh:name "Study Assay Technology Platform U-PLEX" ;
sh:path dcterms:title ;
sh:nodeKind sh:Literal ;
sh:maxCount 2 ;
dash:editor dash:TextFieldEditor ;
] ,
[
sh:name "Study Protocol Name" ;
sh:path dcterms:title ;
sh:nodeKind sh:Literal ;
sh:maxCount 2 ;
dash:editor dash:TextFieldEditor ;
] ,
[
sh:name "Study Protocol Type" ;
sh:path dcterms:title ;
sh:nodeKind sh:Literal ;
```

```
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Type Term Accession Number" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Type Term Source REF" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Description" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol URI" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Version" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
```

```

    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Parameters Name" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Parameters Name Term Accession Number" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Parameters Name Term Source REF" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Components Name" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
] ,
[
    sh:name "Study Protocol Components Type" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;

```



```
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
  ] ,
  [
    sh:name "Study Protocol Components Type Term Accession Number" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
  ] ,
  [
    sh:name "Study Protocol Components Type Term Source REF" ;
    sh:path dcterms:title ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 2 ;
    dash:editor dash:TextFieldEditor ;
  ],
  [
    sh:name "Study Person Last Name" ;
    sh:path foaf:lastName ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 1 ;
    dash:editor dash:TextFieldEditor ;
    dash:viewer dash:LabelViewer ;
  ],
  [
    sh:name "Study Person First Name" ;
    sh:path foaf:firstName ;
    sh:nodeKind sh:Literal ;
    sh:maxCount 1 ;
    dash:editor dash:TextFieldEditor ;
    dash:viewer dash:LabelViewer ;
  ],
  [
    sh:name "Study Person Mid Initials" ;
```

```
sh:path foaf:firstName ;
sh:nodeKind sh:Literal ;
sh:maxCount 1 ;
dash:editor dash:TextFieldEditor ;
dash:viewer dash:LabelViewer ;
],
[
sh:name "Study Person Email" ;
sh:path foaf:OnlineAccount ;
sh:nodeKind sh:Literal ;
sh:maxCount 1 ;
dash:editor dash:TextFieldEditor ;
dash:viewer dash:LabelViewer ;
],
[
sh:name "Study Person Phone" ;
sh:path foaf:phone ;
sh:nodeKind sh:Literal ;
sh:maxCount 1 ;
dash:editor dash:TextFieldEditor ;
dash:viewer dash:LabelViewer ;
],
[
sh:name "Study Person Fax" ;
sh:path foaf:phone ;
sh:nodeKind sh:Literal ;
sh:maxCount 1 ;
dash:editor dash:TextFieldEditor ;
dash:viewer dash:LabelViewer ;
],
[
sh:name "Study Person Address" ;
sh:path foaf:phone ;
sh:nodeKind sh:Literal ;
sh:maxCount 1 ;
```

```
dash:editor dash:TextFieldEditor ;
dash:viewer dash:LabelViewer ;
],
[
  sh:name "Study Person Affiliation" ;
  sh:path foaf:Organization ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],
[
  sh:name "Study Person Roles" ;
  sh:path foaf:Organization ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],
[
  sh:name "Study Person Roles Term Accession Number" ;
  sh:path foaf:Organization ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
],
[
  sh:name "Study Person Roles Term Source REF" ;
  sh:path foaf:Organization ;
  sh:nodeKind sh:Literal ;
  sh:maxCount 1 ;
  dash:editor dash:TextFieldEditor ;
  dash:viewer dash:LabelViewer ;
] .
```

