COLLABORATIVE DATASPACE

LabKey User Conference

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October 23, 2014

AGENDA

Collaborative DataSpace (CDS) Program Overview

- Problem Statement
- Program Components
- Application Walk-through
- Considerations

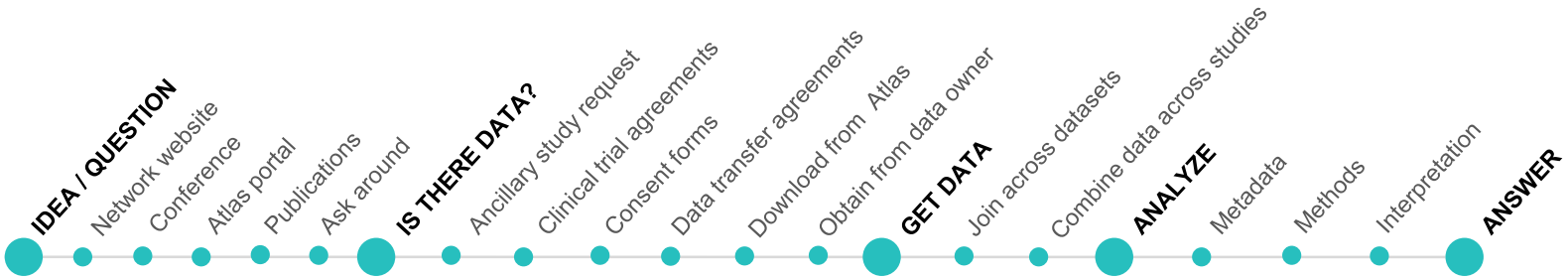
Future of CDS

Problem Statement

“Dramatic shift in the culture and practice of sharing research data”

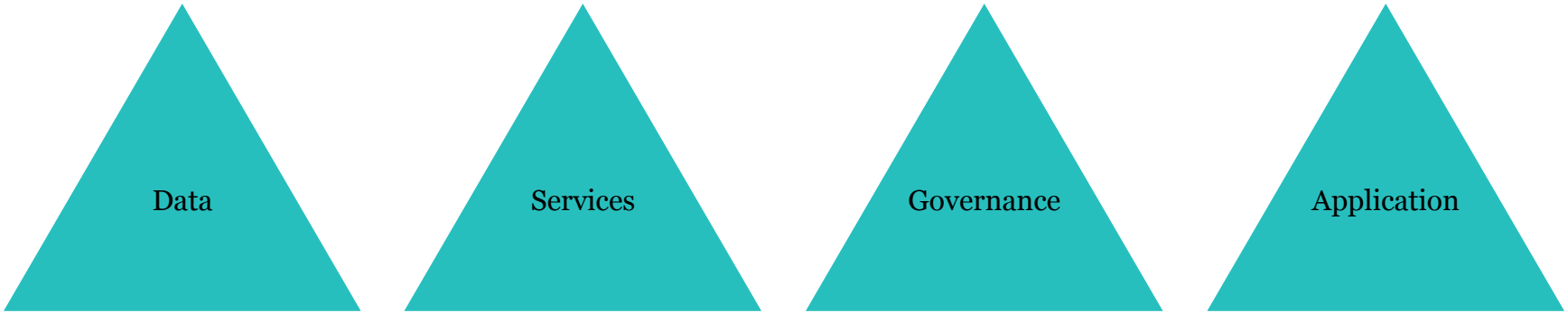
Global HIV Vaccine Enterprise

Current process



The Collaborative DataSpace Program

CDS Program



Content-rich, annotated catalog of integrated study data and metadata

Outreach, analysis and support services

Promotes engagement and data consistency across networks

Web-based app combines CDS data compendium and user services and applies data security model

What CDS is (and what it isn't)

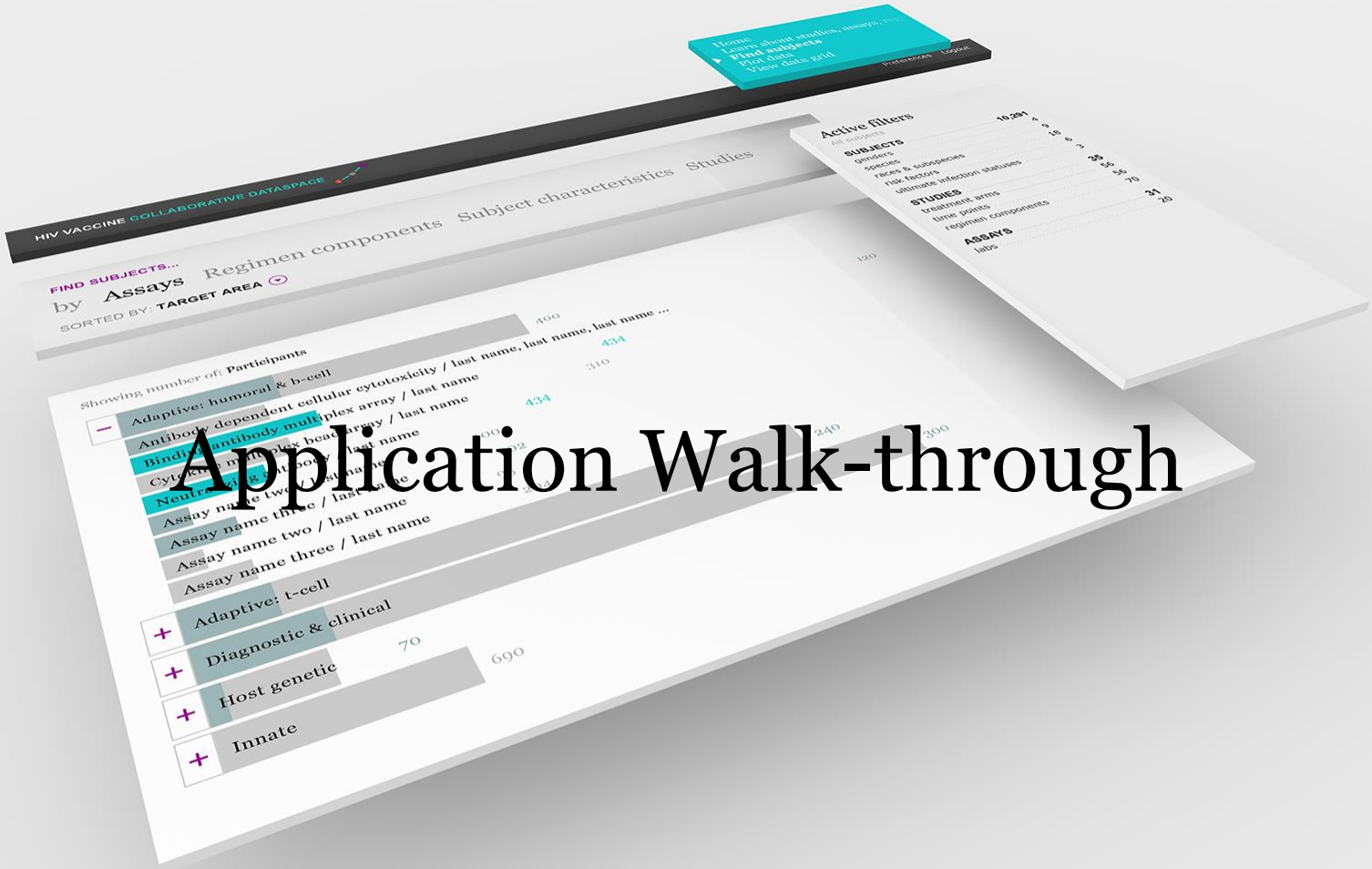
CDS helps researchers:

- Discover basic facts and learn what data exist
- Perform quick, low-cost tests of ideas
- Compare data across studies and assay types
- Communicate findings

CDS is not:

- Source for statistical proof
- Deep analysis environment
- Source for raw lab data
- Repository of "datasets"

The Components of CDS



Application Walk-through

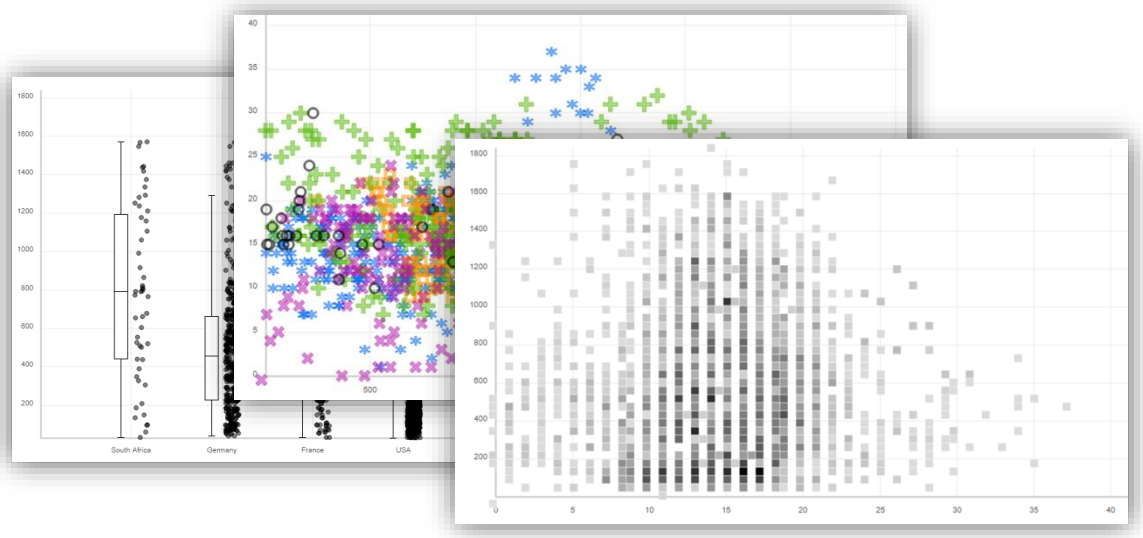
HIV VACCINE COLLABORATIVE DATASPACE

Welcome to the HIV Vaccine Collaborative Dataspace.

6 studies connected together combining 20,501 data points.

The Global HIV Vaccine Enterprise called for a dramatic change in the culture and practice of sharing research data, and UNAIDS demanded, "faster, smarter, better" programs. Solutions will come from collective efforts and strong community interaction.

The HIV Vaccine Data Connector is the place to find potential relationships between data sets that were previously difficult to compare due to access restrictions and problems of data alignment.



I agree to protect restricted data, credit others, and obtain official approval to publish.

I have read, understood, and agree to the terms of use available below.

Email address: brittp@labkey.com

Password: ••••••••••••

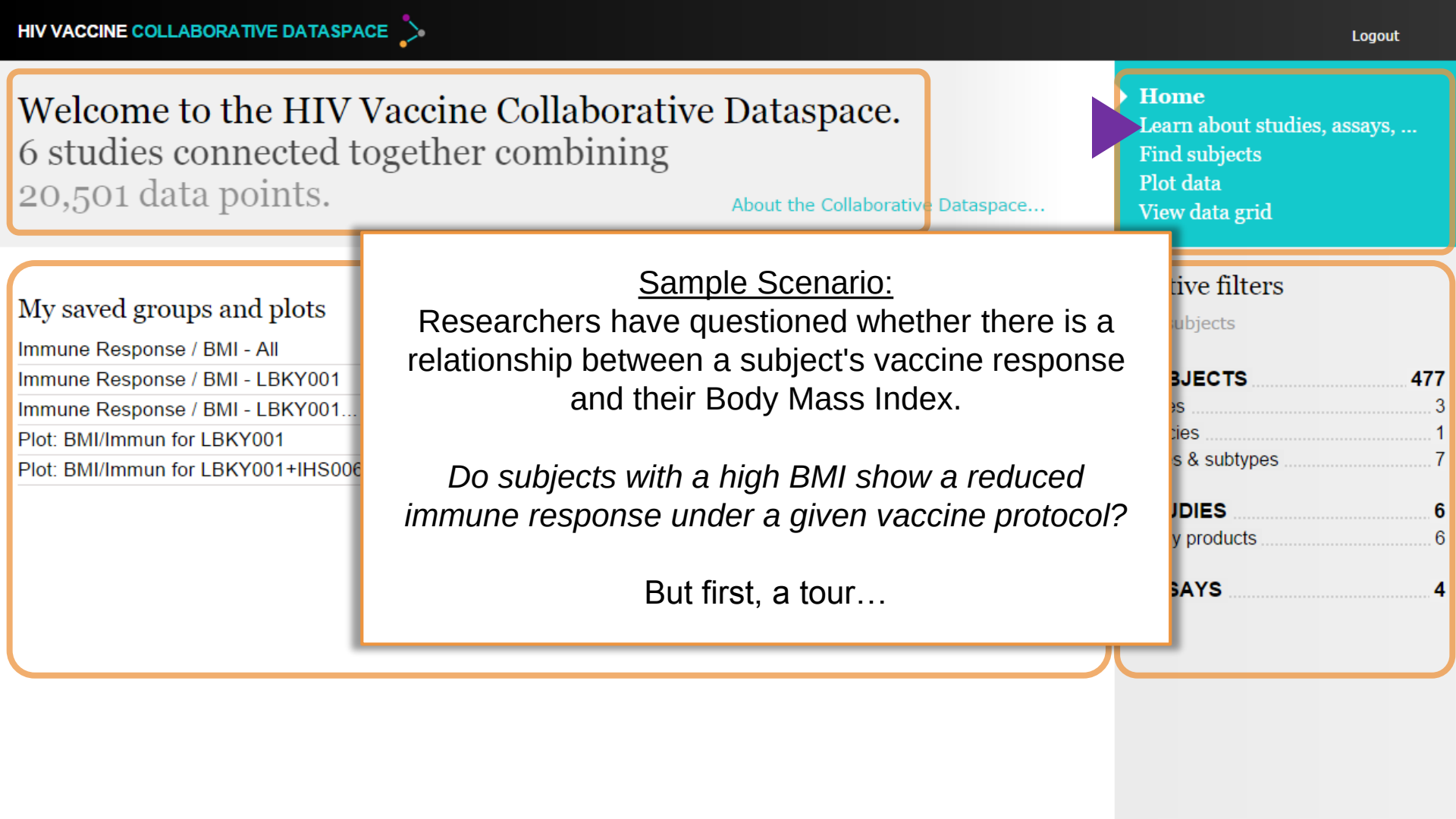
Remember my email address

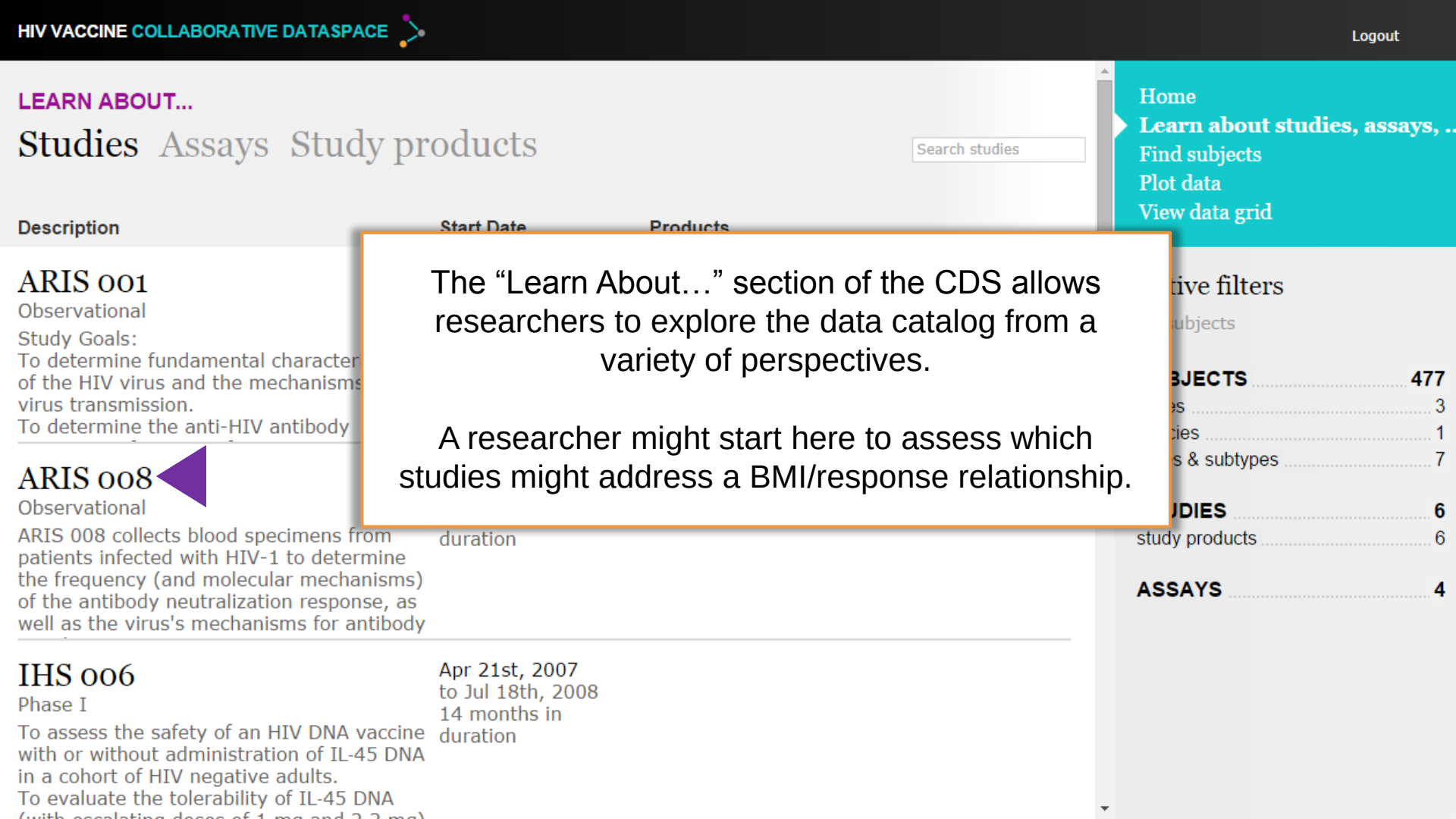
Forgot your password?

sign in

To access and view data in this site you must agree to the Terms of Use for HIV Collaborative DataSpace, which are available for review by clicking the link below. Please read these terms carefully. By accessing this site you agree to be bound by these terms. These terms are subject to change. Any changes will be incorporated into the terms posted to this site from time to time. If you do not agree with these terms, please do not access the site. If you are not an authorized user of this site you are hereby notified that any access or use of the information herein is strictly prohibited.

Terms of Use of the HIV Collaborative DataSpace


HIV VACCINE COLLABORATIVE DATASPACE
Logout
Welcome to the HIV Vaccine Collaborative Dataspace.
6 studies connected together combining
20,501 data points.
About the Collaborative Dataspace...
Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid
My saved groups and plots
Immune Response / BMI - All
Immune Response / BMI - LBKY001
Immune Response / BMI - LBKY001...
Plot: BMI/Immun for LBKY001
Plot: BMI/Immun for LBKY001+IHS006
tive filters
ubjects
BJECTS 477
es 3
cies 1
s & subtypes 7
UDIES 6
y products 6
SAYS 4
Sample Scenario:
Researchers have questioned whether there is a relationship between a subject's vaccine response and their Body Mass Index.
Do subjects with a high BMI show a reduced immune response under a given vaccine protocol?
But first, a tour…


HIV VACCINE COLLABORATIVE DATASPACE
Logout
LEARN ABOUT...
Studies Assays Study products
Search studies
Description
Start Date
Products
ARIS 001
Observational
Study Goals:
To determine fundamental character
of the HIV virus and the mechanisms
virus transmission.
To determine the anti-HIV antibody
ARIS 008
Observational
ARIS 008 collects blood specimens from patients infected with HIV-1 to determine the frequency (and molecular mechanisms) of the antibody neutralization response, as well as the virus's mechanisms for antibody
duration
IHS 006
Phase I
To assess the safety of an HIV DNA vaccine with or without administration of IL-45 DNA in a cohort of HIV negative adults.
To evaluate the tolerability of IL-45 DNA
Apr 21st, 2007
to Jul 18th, 2008
14 months in
duration
Home
Learn about studies, assays, ..
Find subjects
Plot data
View data grid
tive filters
ubjects
BJECTS 477
es 3
cies 1
s & subtypes 7
UDIES 6
study products 6
ASSAYS 4
The “Learn About…” section of the CDS allows researchers to explore the data catalog from a variety of perspectives.
A researcher might start here to assess which studies might address a BMI/response relationship.

Study: ARIS 008

back studies

Select: all study subjects

Home
Learn about studies, assays, ..
Find subjects
Plot data
View data grid

Network: ARIS
Study Type: Observational
Stage: Ongoing
First participant enrolled: Apr 12th, 2008
Follow up complete: Apr 12th, 2010

Description

ARIS 008 collects blood specimens from patients infected with HIV-1 to determine the frequency (and molecular mechanisms) of the antibody neutralization response, as well as the virus's mechanisms for antibody avoidance.

CDS editorial

The MIH has awarded a grant to ARIS to contribute to the Worldwide HIV/AIDS Vaccine Project (WWHVP). ARIS investigators will use state-of-the art technology and coordinated studies to address projects targeted at the production of a HIV-1 vaccine. In ARIS 008, investigators will explore the molecular basis of HIV-1 neutralization.

Study objectives

Primary Objectives:

- To determine the prevalence of acute HIV infection.

Contact information

Contact the Collaborative DataSpace team for more information
Propose an ancillary study

Products

VAC-HDNA022-VEC4

Clinical Data

✓ = available in the Collaborative DataSpace
✓ Demographics
✓ Physical Exam

HIV Diagnostics

✓ = available in the Collaborative DataSpace
✓ HIV Test Results
✓ Lab Results

HIV Immunogenicity Assays

✓ = available in the Collaborative DataSpace

Active filters

All subjects

SUBJECTS	**477**
sexes	3
species	1
races & subtypes	7
STUDIES	**6**
study products	6
ASSAYS	**4**

LEARN ABOUT...

Studies Assays Study products

Search studies

Description	Start Date	Products
ARIS 001 Observational Study Goals: To determine fundamental characteristics of the HIV virus and the mechanisms of virus transmission. To determine the anti-HIV antibody	Apr 12th, 2008 to Apr 12th, 2010 23 months in duration	
ARIS 008 Observational ARIS 008 collects blood specimens from patients infected with HIV-1 to determine the frequency (and molecular mechanisms) of the antibody neutralization response, as well as the virus's mechanisms for antibody	Apr 12th, 2008 to Apr 12th, 2010 23 months in duration	
IHS 006 Phase I To assess the safety of an HIV DNA vaccine with or without administration of IL-45 DNA in a cohort of HIV negative adults. To evaluate the tolerability of IL-45 DNA	Apr 21st, 2007 to Jul 18th, 2008 14 months in duration	

Active filters

All subjects

SUBJECTS	**477**
sexes	3
species	1
races & subtypes	7
STUDIES	**6**
study products	6
ASSAYS	**4**

LEARN ABOUT...

Studies Assays Study products

Search assays

Name	Type	Platform/Target/Function
ADCC data	Cellular	Platform: ICS Target: Function: Activation
Luminex data	Humoral	Platform: Luminex Target: Function: Activation
mRNA assay	Humoral	Platform: ICS Target: Function: Inhibition

Home
Learn about studies, assays, ..
Find subjects
Plot data
View data grid

Active filters

All subjects

SUBJECTS	**477**
sexes	3
species	1
races & subtypes	7
STUDIES	**6**
study products	6
ASSAYS	**4**

LEARN ABOUT...

Studies Assays Study products

Search study products

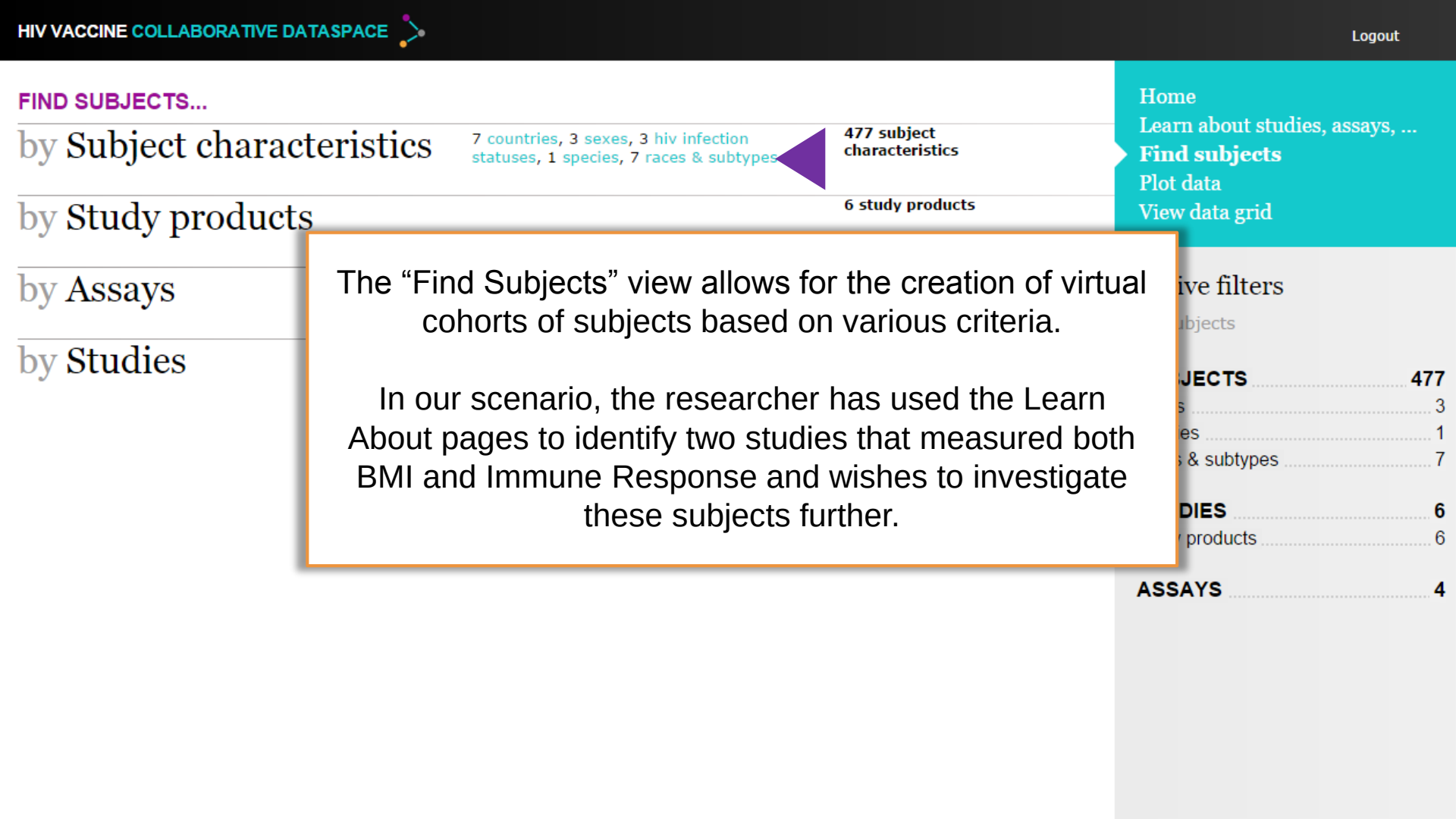
Home
Learn about studies, assays, ..
Find subjects
Plot data
View data grid

Product name	Type	Developer
Placebo Sugar placebo.	Sugar Class: Subclass:	MIAID/National Standard Lab/New Brook, Virginia
Plasmid IL-2 Adjuvant	Protein Class: Subclass:	Immunology Standards Institute, Meadowbrook, NC
VAC-HDNA023-MPV VAC-HDNA023-MPV - Sa promotori SV40 Est usque ad placitum Research Institute ostendit Line magbilanggo ang Rous sarkoma Virus (SRV) tagataguyod fine superius salawikain magna. Nuper voce	Vaccine Class: DNA Subclass:	VRCenter/MNIIS, Athens, GA

Active filters

All subjects

SUBJECTS	**477**
sexes	3
species	1
races & subtypes	7
STUDIES	**6**
study products	6
ASSAYS	**4**

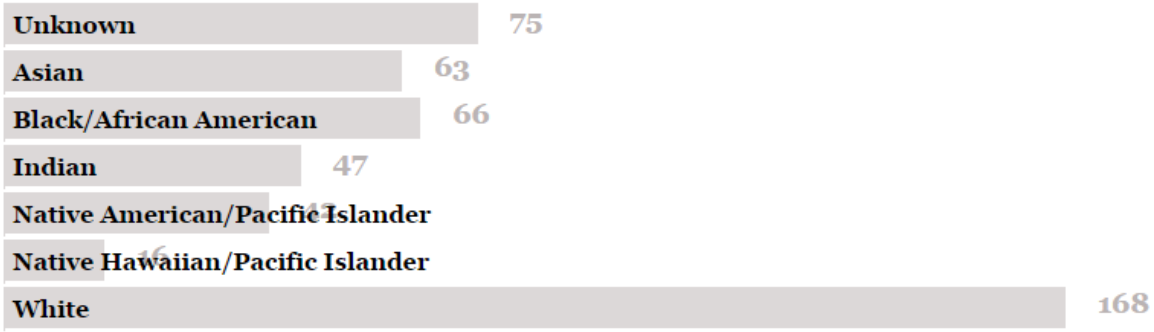

HIV VACCINE COLLABORATIVE DATASPACE
Logout
FIND SUBJECTS...
by Subject characteristics
7 countries, 3 sexes, 3 hiv infection statuses, 1 species, 7 races & subtypes
477 subject characteristics
by Study products
6 study products
by Assays
by Studies
Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid
ive filters
ubjects
JECTS 477
s 3
es 1
& subtypes 7
DIES 6
products 6
ASSAYS 4
The “Find Subjects” view allows for the creation of virtual cohorts of subjects based on various criteria.
In our scenario, the researcher has used the Learn About pages to identify two studies that measured both BMI and Immune Response and wishes to investigate these subjects further.

Subject characteristics

SORTED BY: RACE & SUBTYPE

Showing number of: **Subjects**

hide empty



Active filters

All subjects

SUBJECTS	**477**
sexes	3
species	1
races & subtypes	7
STUDIES	**6**
study products	6
ASSAYS	**4**

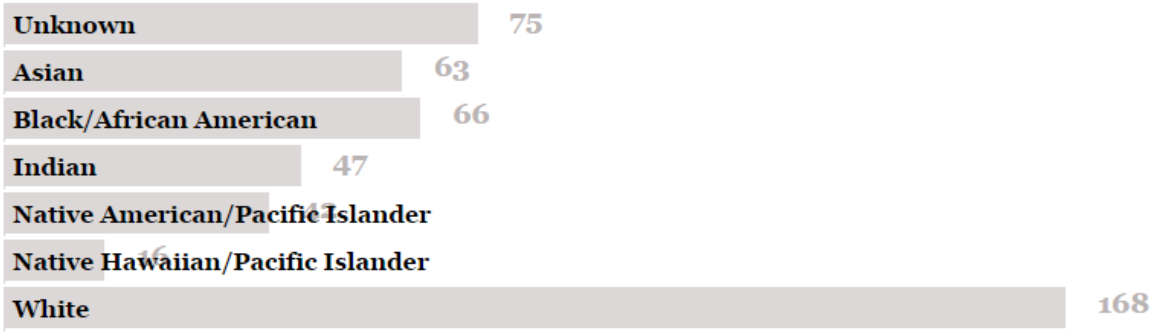
Subject characteristics

SORTED BY: RACE & SUBTYPE

- Subject characteristics
- Study products
- Assays
- Studies

Showing number of: **Subjects**

hide empty



Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Active filters

All subjects

SUBJECTS	**477**
sexes	3
species	1
races & subtypes	7
STUDIES	**6**
study products	6
ASSAYS	**4**

Studies

SORTED BY: NAME

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Showing number of: **Subjects**

hide empty

- ARIS 001 42
- ARIS 008 6
- DataSpaceProject
- IHS 006 219
- LBKY 001 223
- LBKY 144 9
- LBKY 244 9

Active filters

All subjects

SUBJECTS 477
sexes 3
species 1
races & subtypes 7

STUDIES 6
study products 6

ASSAYS 4

Studies

SORTED BY: NAME

Showing number of: **Subjects** hide empty

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Active filters

All subjects

CURRENT SELECTION

Study

OR

LBKY 001

IHS 006

use as filter | label as subgroup | clear

SUBJECTS	442 of 477
sexes	3 of 3
species	1 of 1
races & subtypes	7 of 7
STUDIES	2 of 6
study products	3 of 6
ASSAYS	2 of 4

Studies

SORTED BY: NAME

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Showing number of: **Subjects**

hide empty

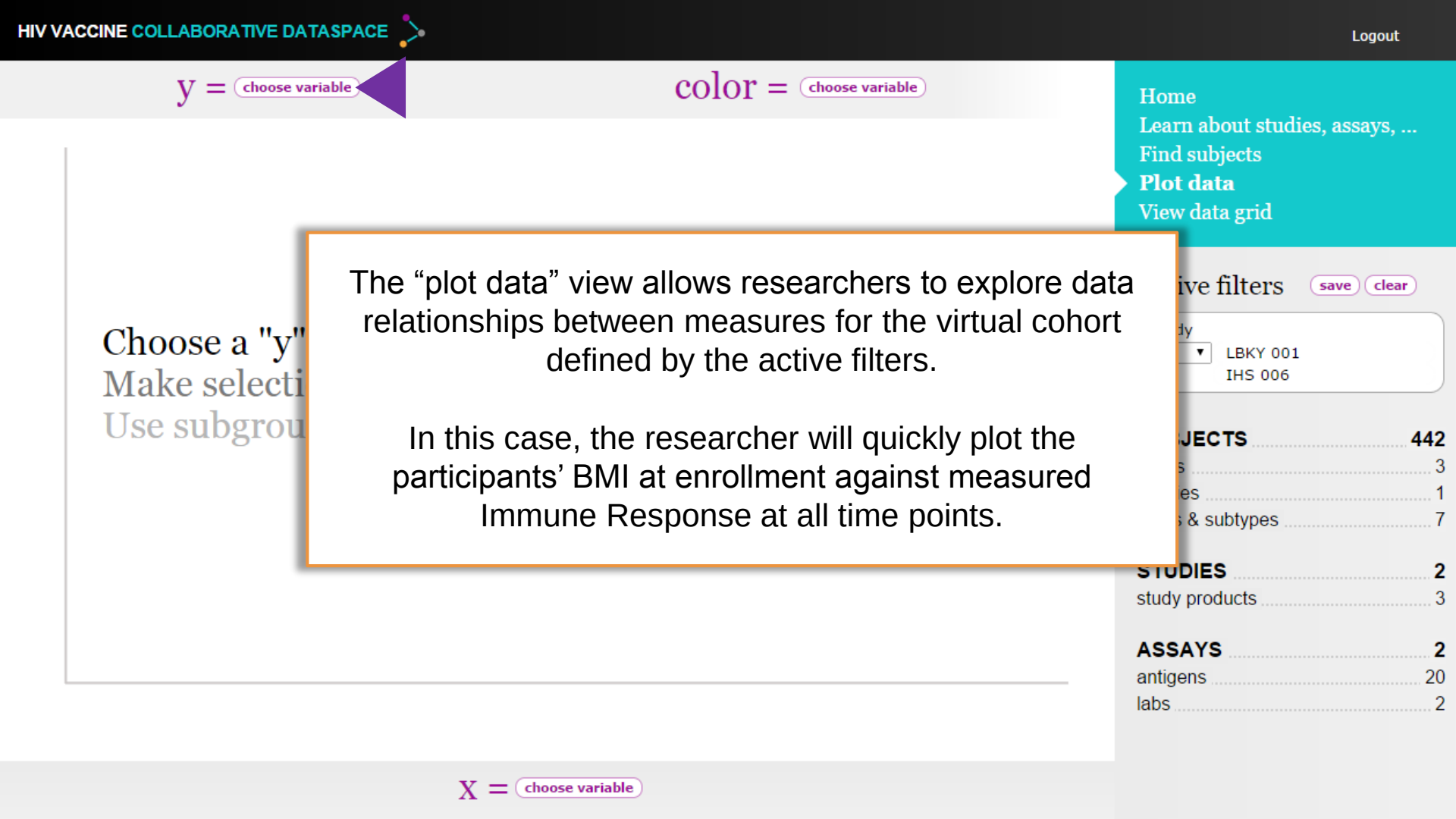
ARIS 001	
ARIS 008	
DataSpaceProject	
IHS 006	219
LBKY 001	223
LBKY 144	
LBKY 244	

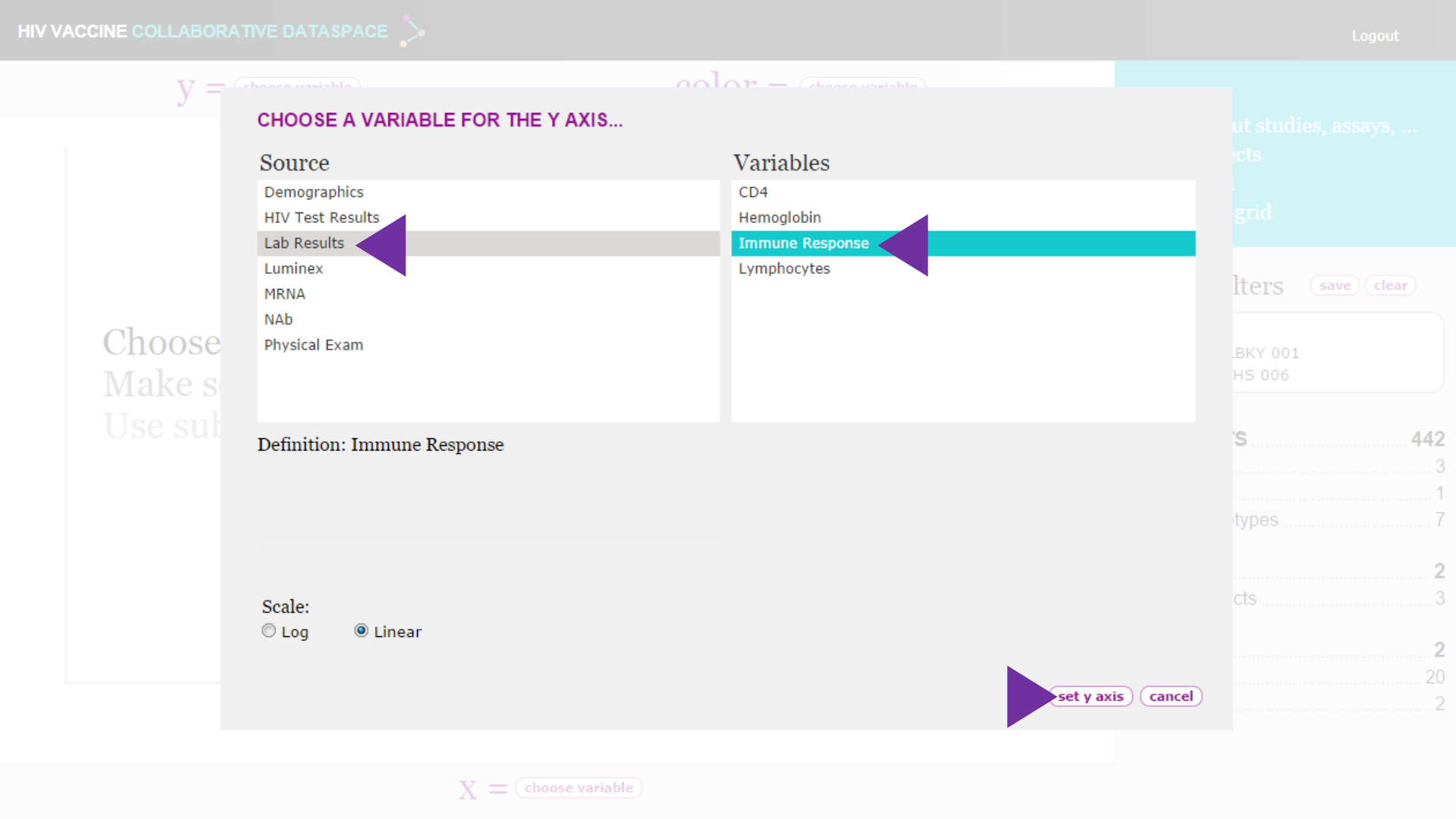
Active filters

save clear

Study
OR
LBKY 001
IHS 006

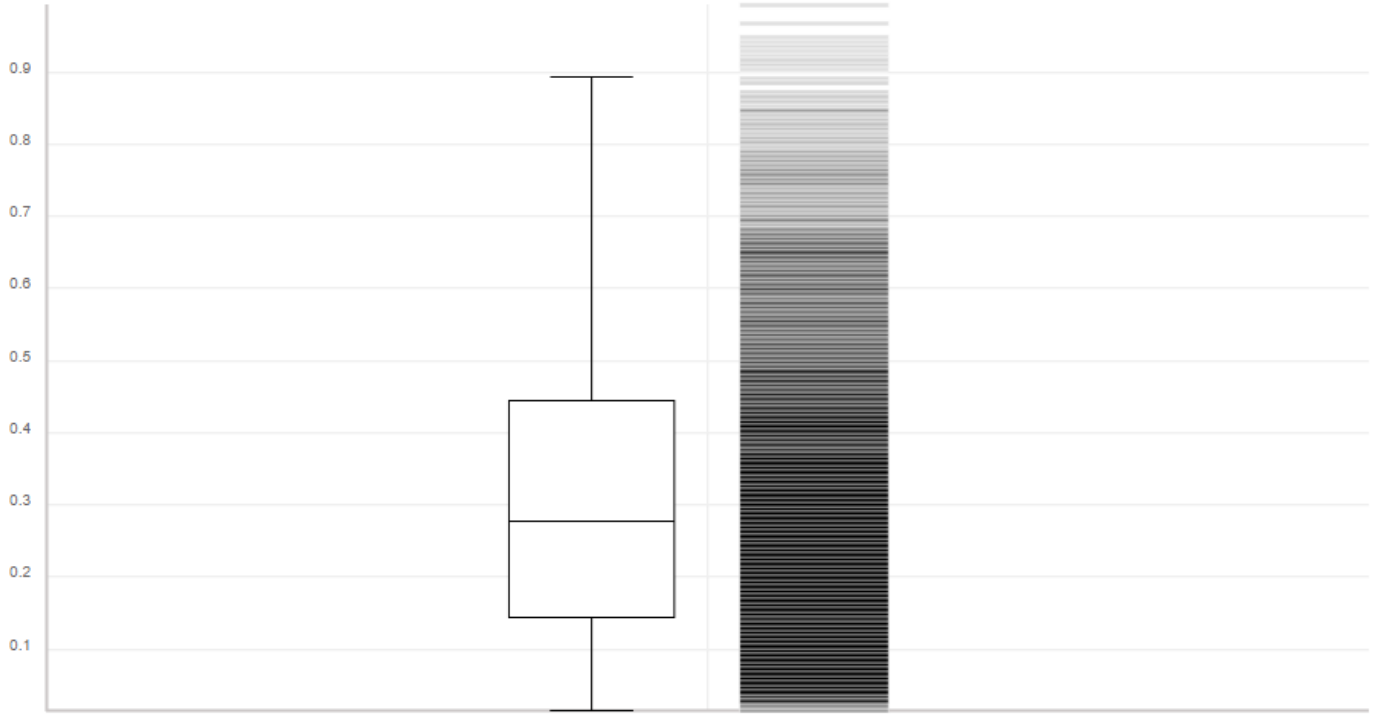
SUBJECTS	**442**
sexes	3
species	1
races & subtypes	7
STUDIES	**2**
study products	3
ASSAYS	**2**


HIV VACCINE COLLABORATIVE DATASPACE
Logout
y = choose variable
color = choose variable
Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid
Choose a "y"
Make selecti
Use subgrou
The “plot data” view allows researchers to explore data relationships between measures for the virtual cohort defined by the active filters.
In this case, the researcher will quickly plot the participants’ BMI at enrollment against measured Immune Response at all time points.
ive filters
save
clear
LBKY 001
IHS 006
JECTS 442
3
es 1
& subtypes 7
STUDIES 2
study products 3
ASSAYS 2
antigens 20
labs 2
X = choose variable


HIV VACCINE COLLABORATIVE DATASPACE
Logout
CHOOSE A VARIABLE FOR THE Y AXIS...
Source
Demographics
HIV Test Results
Lab Results
Luminex
MRNA
NAb
Physical Exam
Variables
CD4
Hemoglobin
Immune Response
Lymphocytes
Definition: Immune Response
Scale:
Log
Linear
set y axis
cancel
choose variable

y = Lab Results Immune Response

color = choose variable



X = choose variable

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Active filters

save clear

In the plot: Immune Response

Study
OR
LBKY 001
IHS 006

SUBJECTS	**233**
sexes	3
species	1
races & subtypes	7
STUDIES	**2**
study products	3
ASSAYS	**2**
antigens	20
labs	2

CHOOSE A VARIABLE FOR THE X AXIS...

Source

- Time points
- User groups

DATASETS

- ADCC
- Demographics
- HIV Test Results
- Lab Results
- Luminex
- MRNA

Variables

- Age at Enrollment
- **BMI at Enrollment**
- Baseline Ad5 Titer
- Baseline Ad5 Titer Category
- Baseline BMI Category
- Circumcision Status
- Comments
- Country
- Day of HIV Cutoff
- EnrolledClinicalSite

Definition: BMI at Enrollment

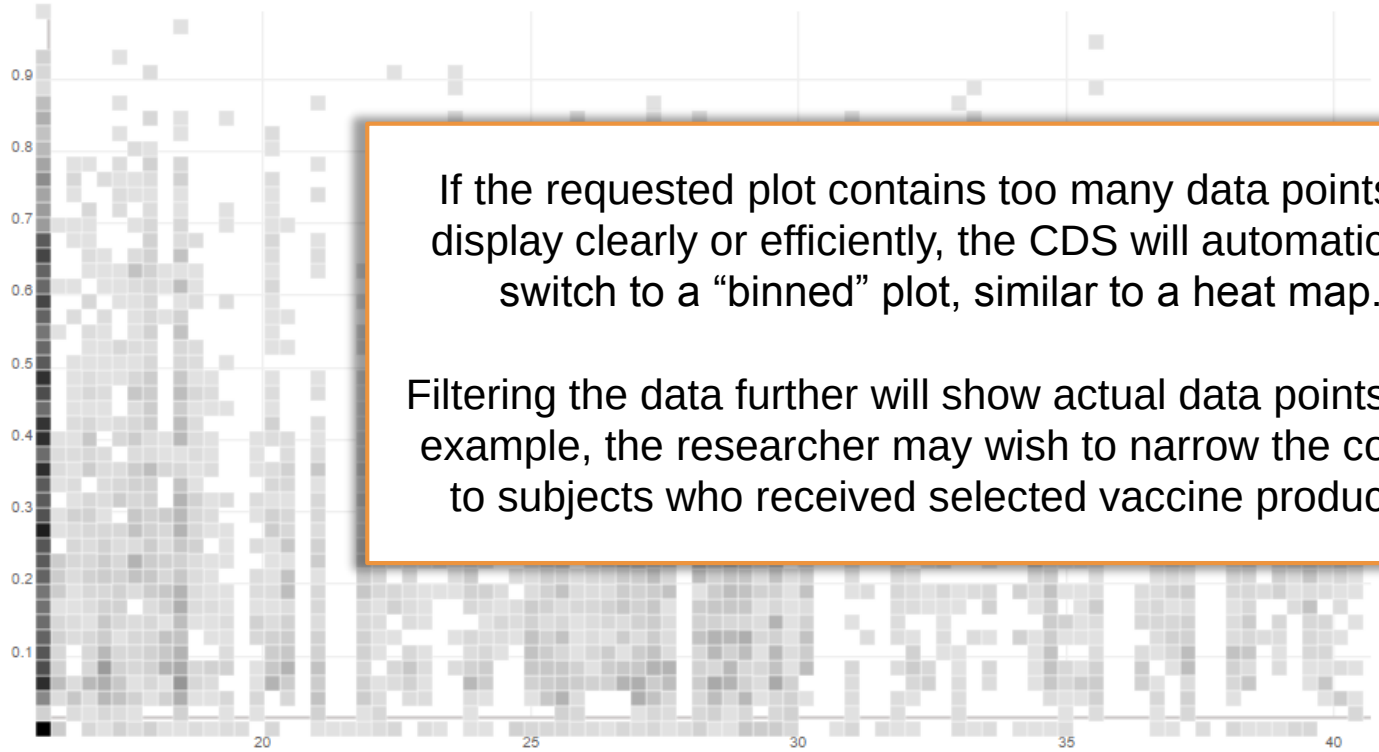
Scale:

(•) Linear ( ) Log

set x axis | cancel

y = Lab Results Immune Response

color = choose variable



If the requested plot contains too many data points to display clearly or efficiently, the CDS will automatically switch to a “binned” plot, similar to a heat map.

Filtering the data further will show actual data points. For example, the researcher may wish to narrow the cohort to subjects who received selected vaccine products.

x = Demographics BMI at Enrollment

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

ive filters save clear

he plot: BMI at Enrollment, Immu

dy

LBKY 001
IHS 006

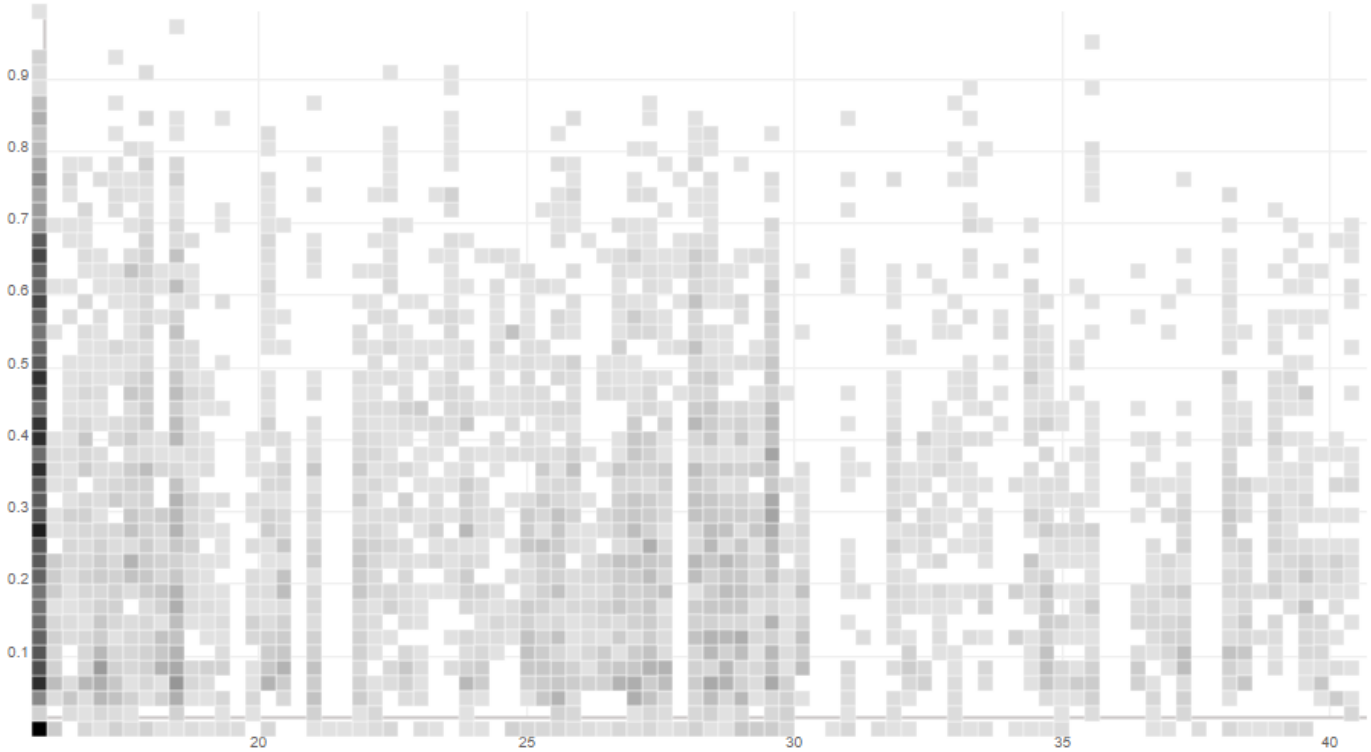
JECTS 442
s 3
es 1
& subtypes 7

STUDIES 2
study products 3

ASSAYS 2
antigens 20
labs 2

y = Lab Results Immune Response

color = choose variable



x = Demographics BMI at Enrollment

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Active filters

save clear

In the plot: BMI at Enrollment, Immu

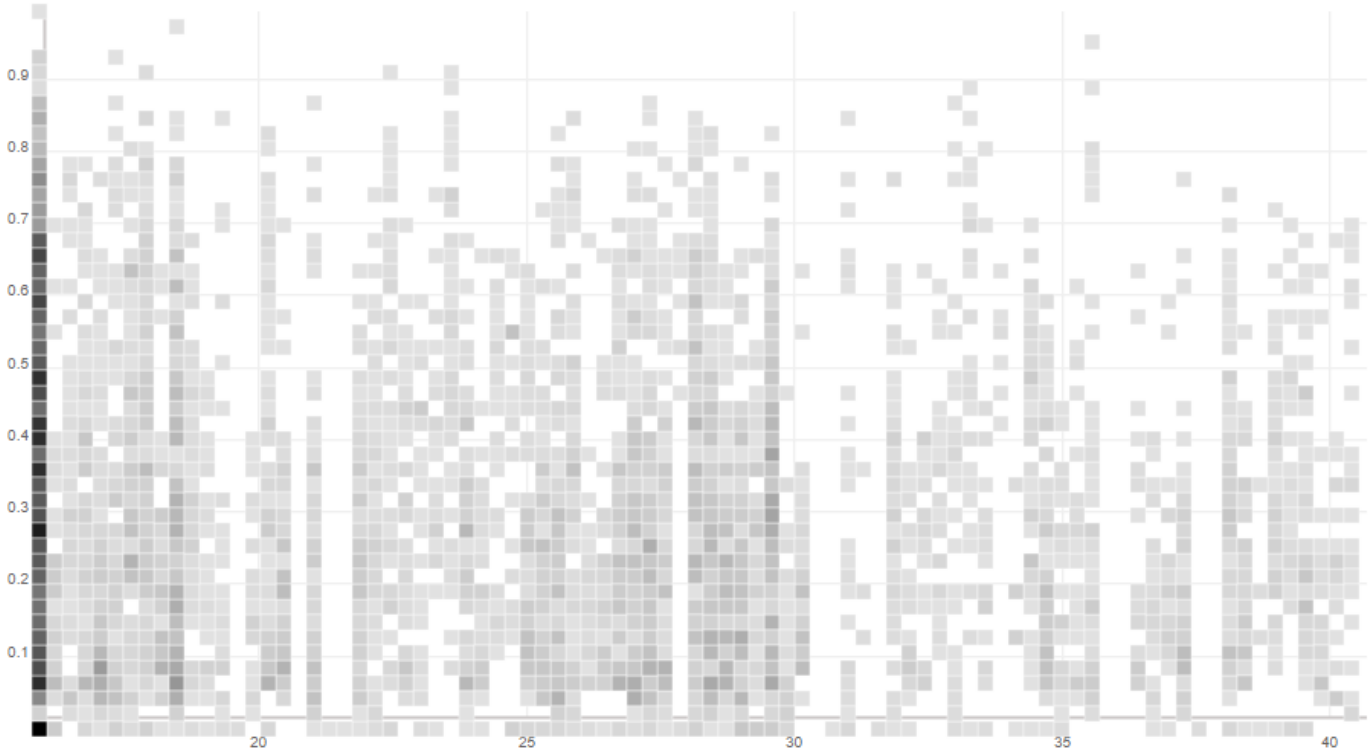
Study

OR ▾ LBKY 001
IHS 006

SUBJECTS	**442**
sexes	3
species	1
races & subtypes	7
STUDIES	**2**
study products	3
ASSAYS	**2**
antigens	20
labs	2

y = Lab Results Immune Response

color = choose variable



x = Demographics BMI at Enrollment

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Study products

SORTED BY: **NAME**

Subjects can fall into multiple Types.

- (•) Subjects related to any (OR)
- ( ) Subjects related to all (AND)

- [ ] All

HAS DATA IN CURRENT SELECTION

- [x] Placebo
- [x] VAC-HDNA022-VEC4
- [x] VAC-HDNA023-MPV

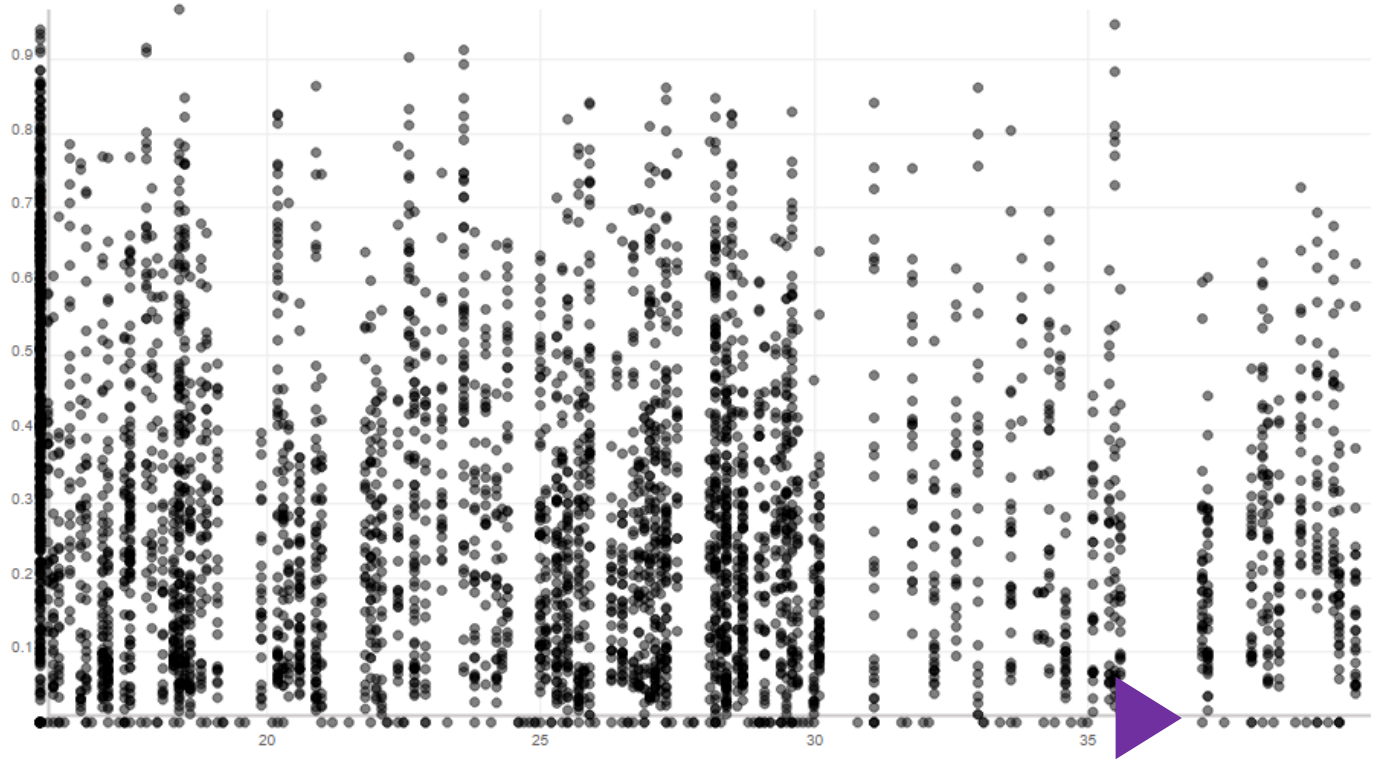
NO DATA IN CURRENT SELECTION

- [x] HIVAX-TPL12
- [x] Plasmid IL-2
- [x] VAC-HDNA019-CAP

filter cancel

y = Lab Results Immune Response

color = choose variable



x = Demographics BMI at Enrollment

Active filters

save clear

In the plot: BMI at Enrollment, Im

Study
OR
LBKY 001
IHS 006

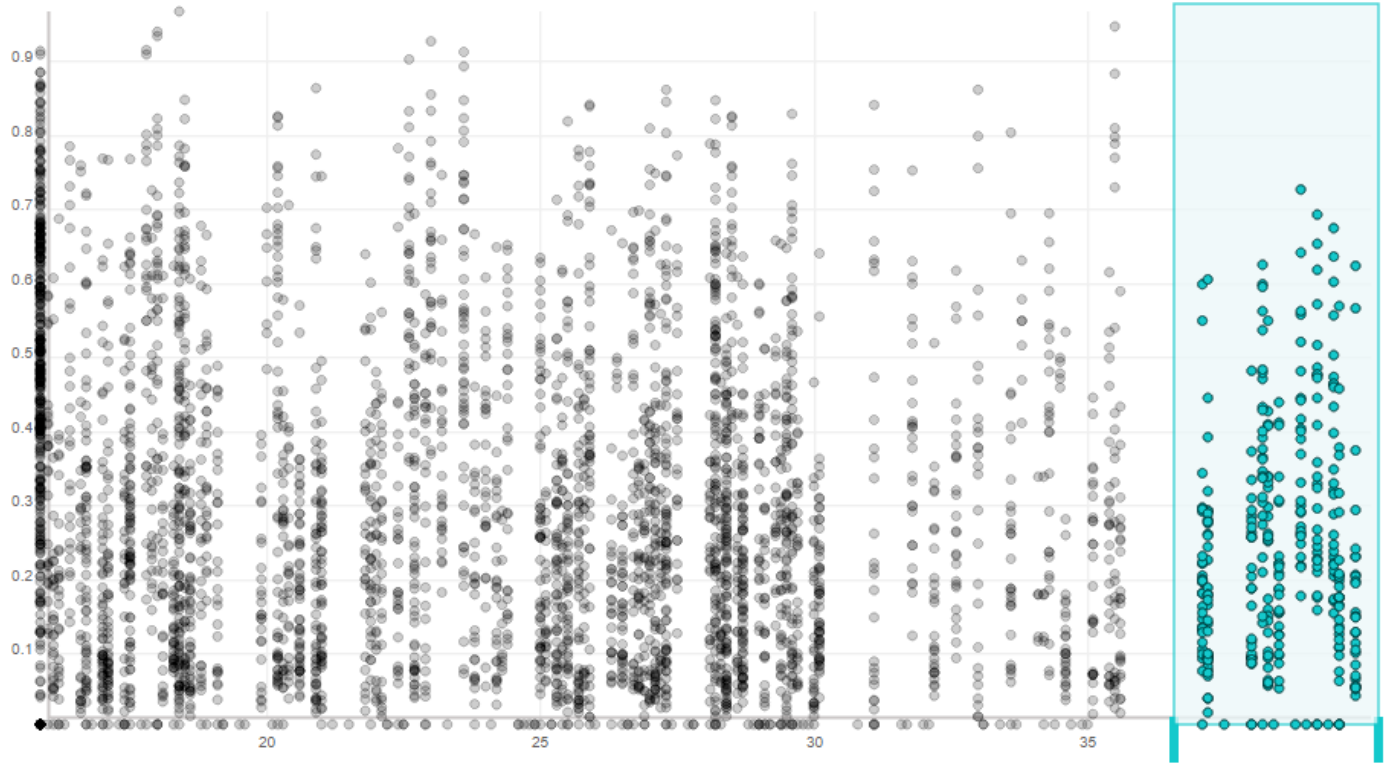
Subjects given study product
OR
VAC-HDNA022-VEC4
VAC-HDNA023-MPV
HIVAX-TPL12
Plasmid IL-2
VAC-HDNA019-CAP

SUBJECTS 330
sexes 3
species 1
races & subtypes 7

STUDIES 2

y = Lab Results Immune Response

color = choose variable



x = Demographics BMI at Enrollment

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

VAC-HDNA022-VEC4
VAC-HDNA023-MPV
HIVAX-TPL12
Plasmid IL-2
VAC-HDNA019-CAP

CURRENT SELECTION

Subjects with:

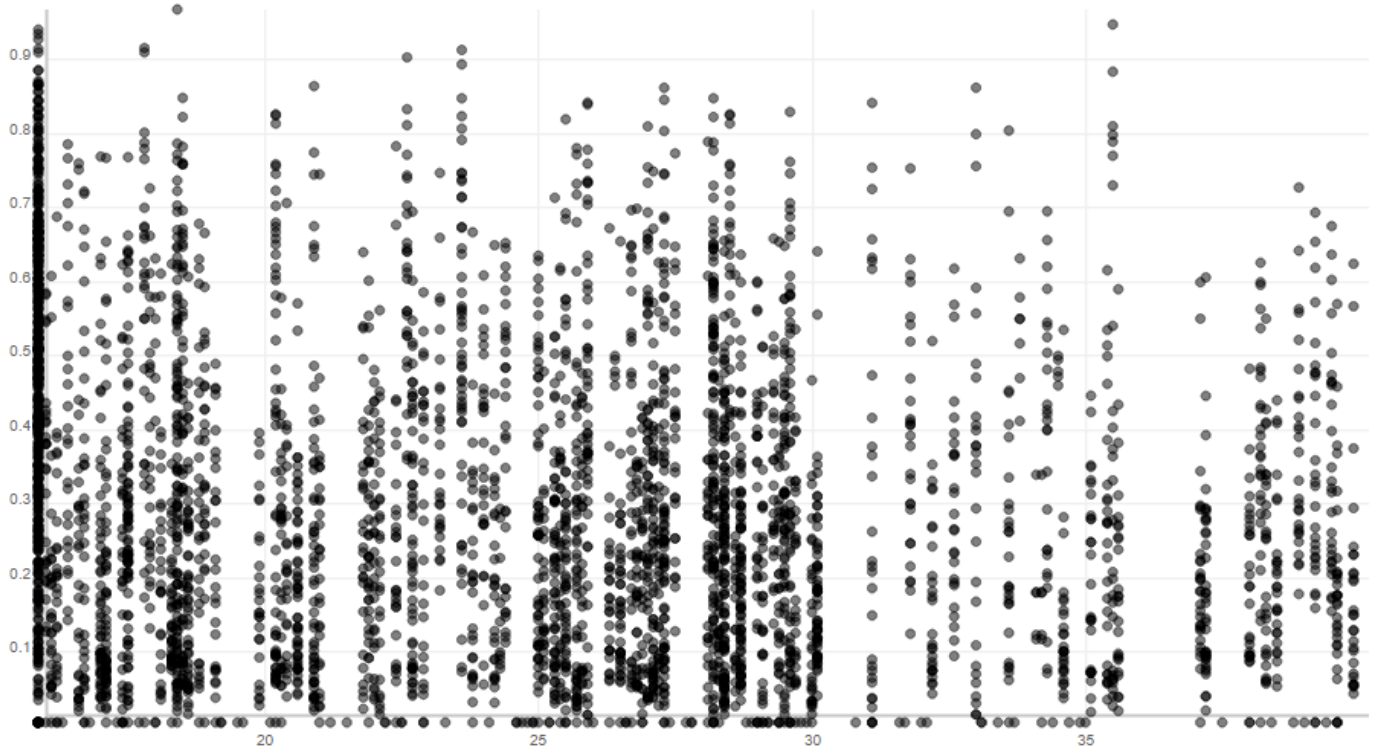
BMI at Enrollment: >= 36.58, <

use as filter | label as subgroup | clea

SUBJECTS	**26 of 330**
sexes	3 of 3
species	1 of 1
races & subtypes	5 of 7
STUDIES	**2 of 2**
study products	3 of 3
ASSAYS	**2 of 2**
antigens	20 of 20
labs	2 of 2

y = Lab Results Immune Response

color = choose variable



x = Demographics BMI at Enrollment

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Active filters

save clear

In the plot: BMI at Enrollment, Im

Study
OR
LBKY 001
IHS 006

Subjects given study product
OR
VAC-HDNA022-VEC4
VAC-HDNA023-MPV
HIVAX-TPL12
Plasmid IL-2
VAC-HDNA019-CAP

SUBJECTS	**330**
sexes	3
species	1
races & subtypes	7
STUDIES	**2**

y = Lab Results

color = choose variable

CHOOSE A VARIABLE FOR THE X AXIS...

Source

- Time points
- User groups

DATASETS

- ADCC
- Demographics
- HIV Test Results
- Lab Results
- Luminex
- MRNA

Variables

- Age at Enrollment
- BMI at Enrollment
- Baseline Ad5 Titer
- Baseline Ad5 Titer Category
- Baseline BMI Category
- Circumcision Status
- Comments
- Country
- Day of HIV Cutoff
- EnrolledClinicalSite

Definition: Baseline BMI Category

remove var | set x axis | cancel

x = Demographics
BMI at Enrollment

ut studies, assays, ...
cts
grid

lters save clear

BMI at Enrollment, Im

BKY 001
HS 006

ven study product

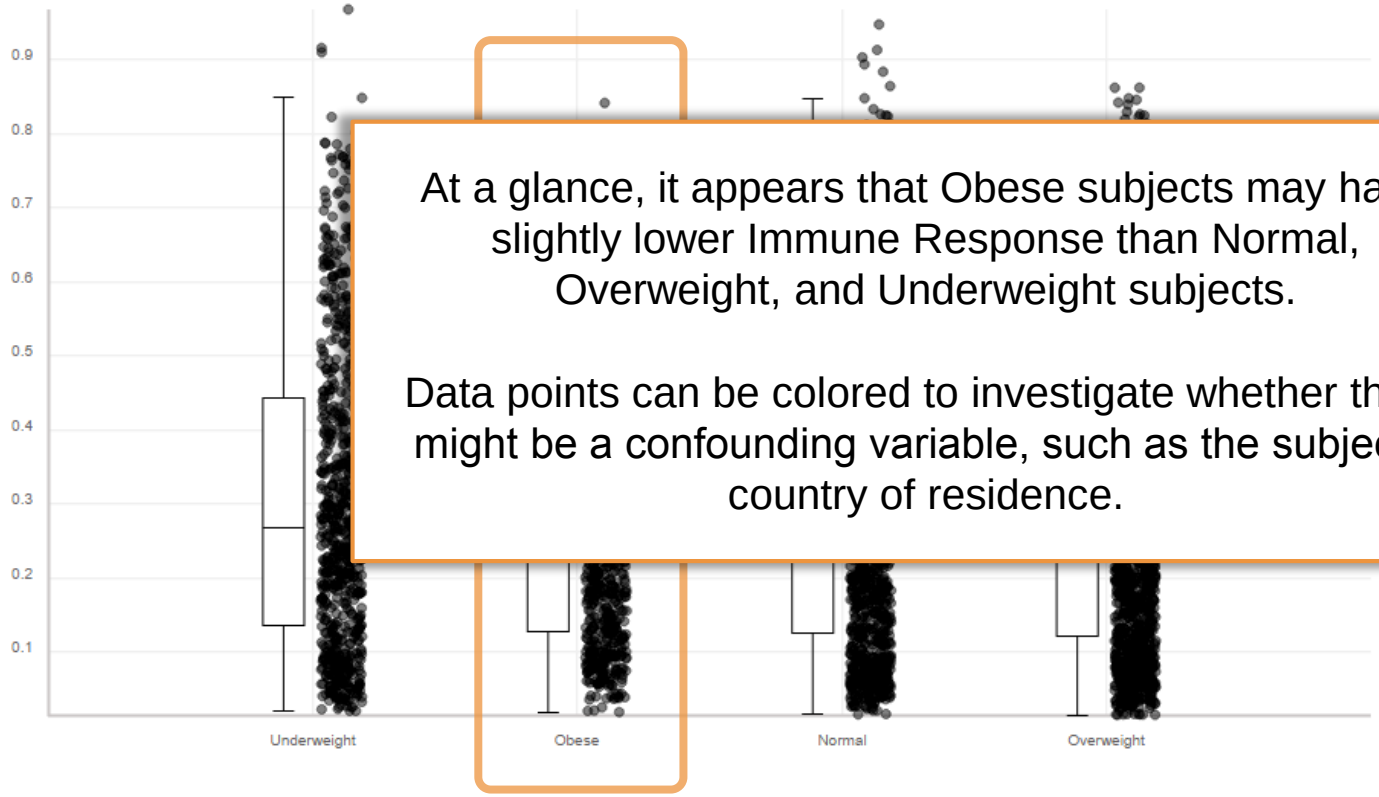
AC-HDNA022-VEC4
AC-HDNA023-MPV
IVAX-TPL12
asmid IL-2
AC-HDNA019-CAP

S 330
3
1
races & subtypes 7

STUDIES 2

y = Lab Results Immune Response

color = choose variable



At a glance, it appears that Obese subjects may have slightly lower Immune Response than Normal, Overweight, and Underweight subjects.

Data points can be colored to investigate whether there might be a confounding variable, such as the subject's country of residence.

x = Demographics Baseline BMI Category

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

tive filters save clear

the plot: Baseline BMI Category

udy
R
LBKY 001
IHS 006

bjects given study product
R
VAC-HDNA022-VEC4
VAC-HDNA023-MPV
HIVAX-TPL12
Plasmid IL-2
VAC-HDNA019-CAP

SUBJECTS 330
sexes 3
species 1
races & subtypes 7

STUDIES 2

CHOOSE A COLOR VARIABLE...

Source

- ADCC
- Demographics
- HIV Test Results
- Lab Results
- Luminex
- MRNA
- NAb
- Physical Exam

Variables

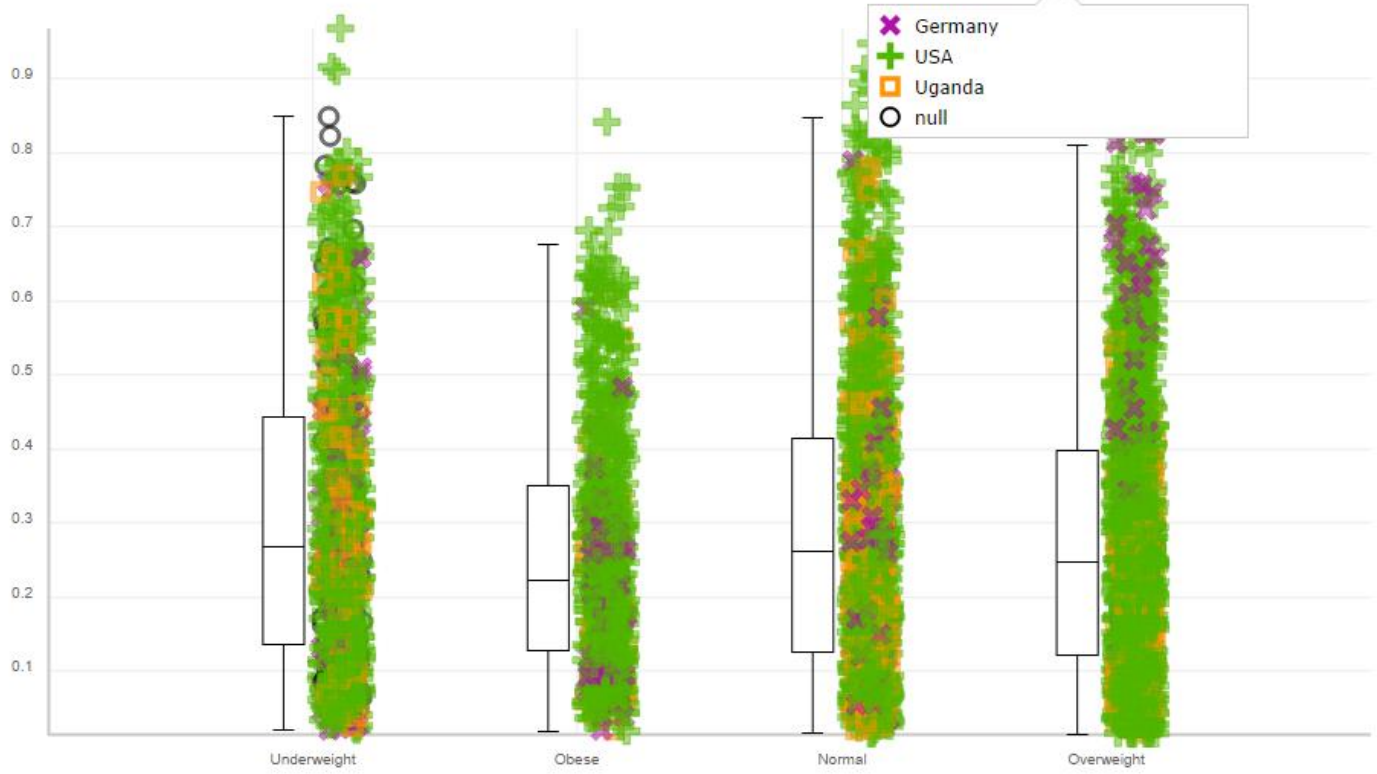
- Baseline BMI Category
- Circumcision Status
- Comments
- Country
- EnrolledClinicalSite
- Group
- HIV Infection Status
- Prime Product and Schedule
- Protocol Code
- Protocol Completion

Definition: Country

set color variable | cancel

y = Lab Results Immune Response

color = Demographics: Country



x = Demographics Baseline BMI Category

Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid

Active filters

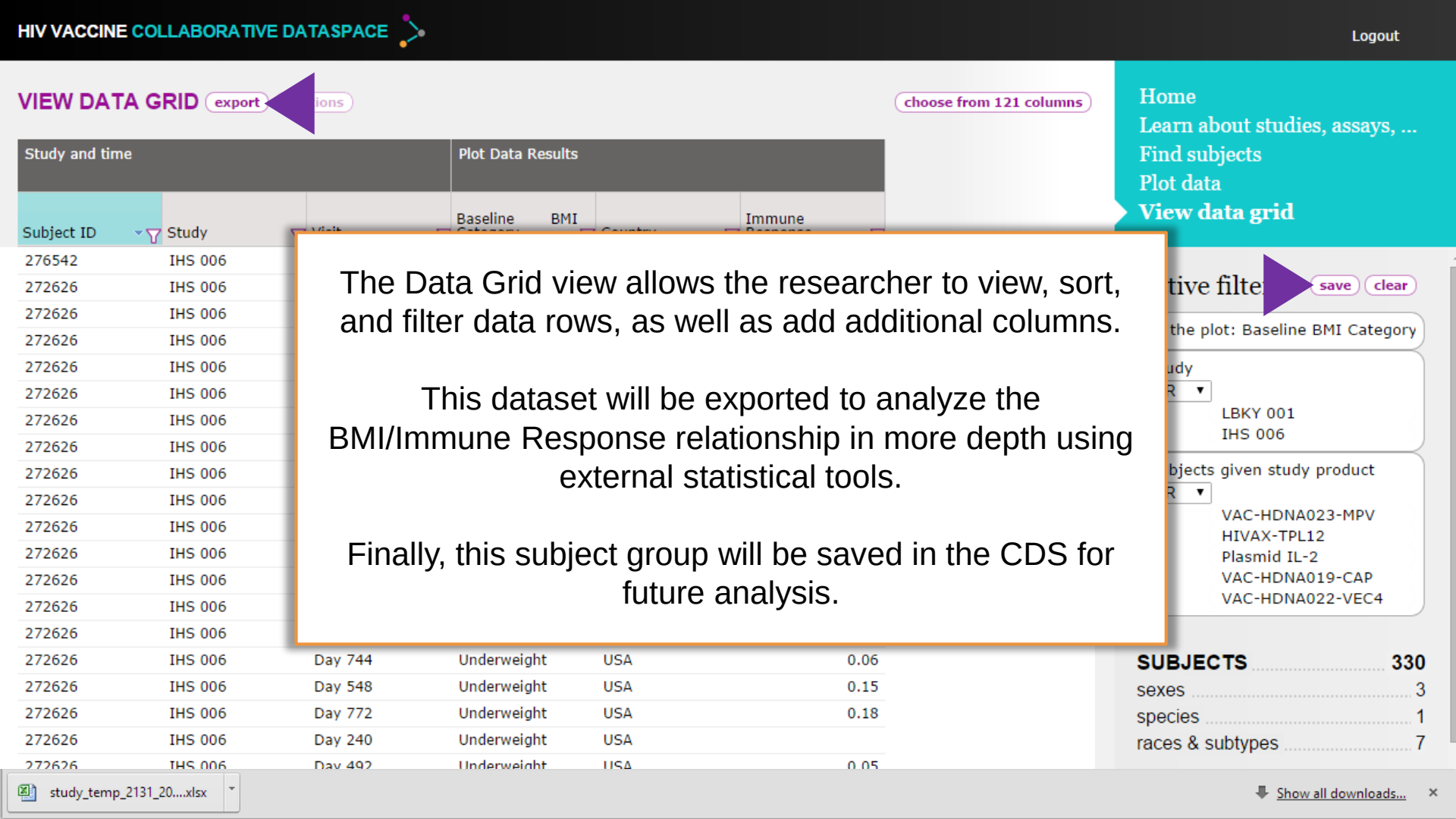
save clear

In the plot: Baseline BMI Category

Study
OR
LBKY 001
IHS 006

Subjects given study product
OR
VAC-HDNA022-VEC4
VAC-HDNA023-MPV
HIVAX-TPL12
Plasmid IL-2
VAC-HDNA019-CAP

SUBJECTS	**330**
sexes	3
species	1
races & subtypes	7
STUDIES	**2**


HIV VACCINE COLLABORATIVE DATASPACE
Logout
VIEW DATA GRID
export
choose from 121 columns
Home
Learn about studies, assays, ...
Find subjects
Plot data
View data grid
Study and time
Plot Data Results
Subject ID
Study
Baseline BMI Category
Immune Response
276542 IHS 006
272626 IHS 006
The Data Grid view allows the researcher to view, sort, and filter data rows, as well as add additional columns.
This dataset will be exported to analyze the BMI/Immune Response relationship in more depth using external statistical tools.
Finally, this subject group will be saved in the CDS for future analysis.
save
clear
the plot: Baseline BMI Category
LBKY 001
IHS 006
VAC-HDNA023-MPV
HIVAX-TPL12
Plasmid IL-2
VAC-HDNA019-CAP
VAC-HDNA022-VEC4
Day 744 Underweight USA 0.06
Day 548 Underweight USA 0.15
Day 772 Underweight USA 0.18
Day 240 Underweight USA
SUBJECTS 330
sexes 3
species 1
races & subtypes 7
study_temp_2131_20....xlsx
Show all downloads...

VIEW DATA GRID

export | citations

choose from 121 columns

Study and time			Plot Data Results		
Subject ID	Study	Visit	Baseline BMI Category	Country	Immune Response
276542	IHS 006	Day 0	Underweight	Germany	
272626	IHS 006	Day 716	Underweight	USA	0.04
272626	IHS 006	Day 884	Underweight	USA	0.16
272626	IHS 006	Day 912	Underweight	USA	0.12
272626	IHS 006	Day 380	Underweight	USA	0.10
272626	IHS 006	Day 660	Underweight	USA	0.07
272626	IHS 006	Day 352	Underweight	USA	0.10
272626	IHS 006	Day 464	Underweight	USA	0.06
272626	IHS 006	Day 520	Underweight	USA	0.10
272626	IHS 006	Day 688	Underweight	USA	0.04
272626	IHS 006	Day 968	Underweight	USA	0.09
272626	IHS 006	Day 604	Underweight	USA	0.09
272626	IHS 006	Day 632	Underweight	USA	0.07
272626	IHS 006	Day 940	Underweight	USA	0.08
272626	IHS 006	Day 828	Underweight	USA	0.13
272626	IHS 006	Day 744	Underweight	USA	0.06
272626	IHS 006	Day 548	Underweight	USA	0.15
272626	IHS 006	Day 772	Underweight	USA	0.18
272626	IHS 006	Day 240	Underweight	USA	
272626	IHS 006	Day 492	Underweight	USA	0.05

Save group

Current Selection will be applied

BMI/Immune Response Hypothesis

Non-placebo subjects from LBKY 001/IHS 006; observed lower response in Obese subjects, significance and causal relationship unclear.

- (•) Live: Update group with new data
- ( ) Snapshot: Keep this group static

Or...

replace an existing group

save | cancel

The Other (Often Unappreciated) Components of the CDS Program

Important work is hidden beneath the surface

CDS application

Data harmonization/integration

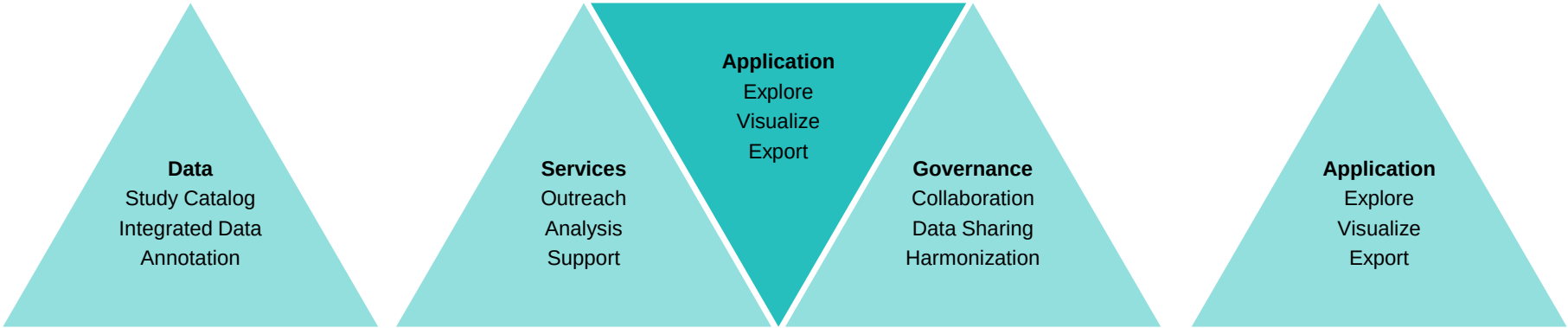
Data annotation

User services

Outreach, training, support

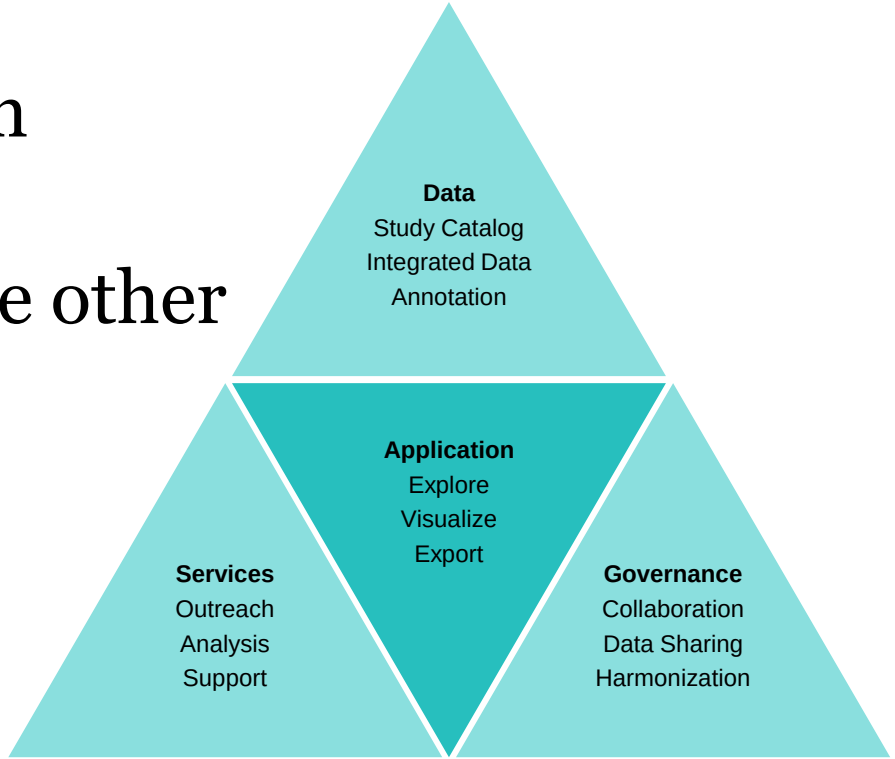
Program and data governance

Integrated CDS Program



Integrated CDS Program

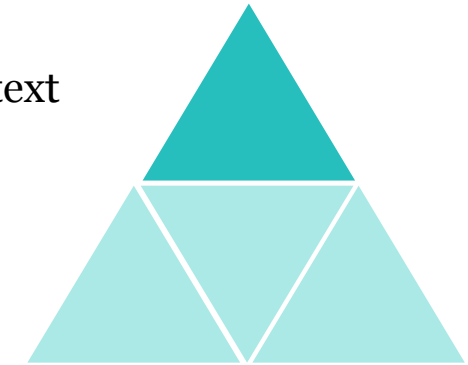
Why are these other components important?



CDS Program: Data Component

Main Elements

- Study Catalog – Facilitate discovery and provide historical context
- Integrated Data – High volume of combined data
- Annotation – Critical to interpretation



Other Considerations

- Whether to restrict users to combine certain data
- CDS data model, data harmonization, controlled terminology
- Raw versus processed data

CDS Program: Services Component

Main Elements

- Outreach – Promote utilization and build community
- Analysis – Assist with analyses and interpretation
- Support – Combination of self-service and facilitated support

Other Considerations

- Maintaining accurate and current list of users
- User metrics

CDS Program: Governance Component

Main Elements

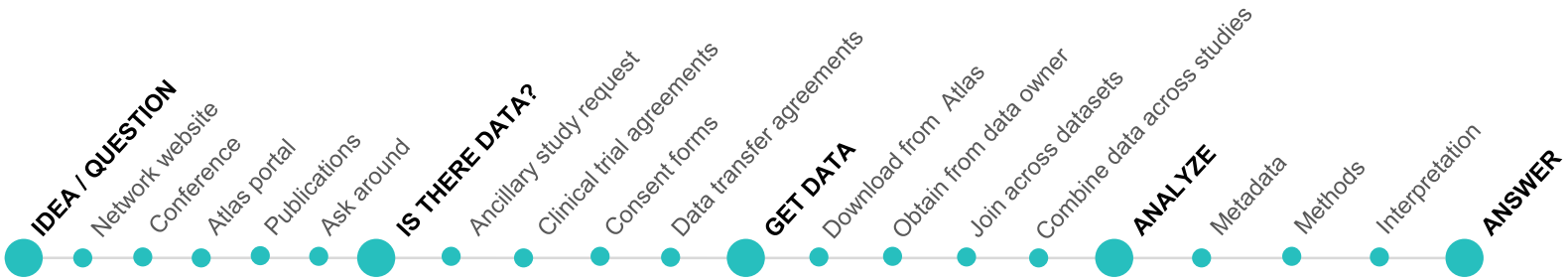
- Collaboration – Network engagement in governance
- Data Sharing – Global data sharing and use agreements
- Harmonization – Increase efficiency of data integration

Other Considerations

- Public access
- Flexible data sharing and collaboration levels
- Identify potential legal issues and informed consent concerns


Network A
Easier Collaboration
Network B
Data
Explore
Export
Support
Visualize
Outreach
Analyze
Governance
CDS

Current process



CDS process

CDS shows what data were collected and what is available without needing help from others

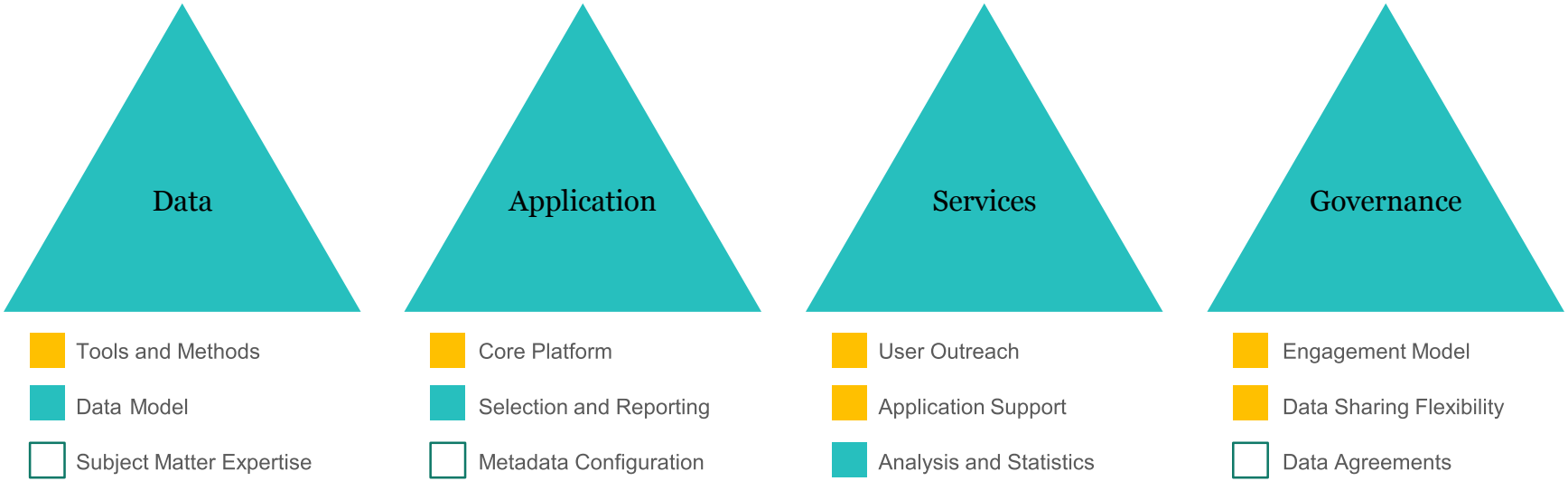
Networks agree to a single overarching agreement one time, saving users cumbersome steps

Data are already joined, harmonized, and annotated with interactive tools, saving effort

Deeper data annotation and resource information are all in one place to facilitate appropriate interpretation

Future of CDS

CDS Program Extensibility



Readily applicable to other pathogen/vaccine problems

Possibly or partially applicable

HIV-specific

Statistical Center for HIV/AIDS Research & Prevention SCHARP

Oversight, coordination, data integration

Product design

LabKey Software PARTNERS IN SCIENCE

Product development

IBM

Consultation on data integration and system development

Questions?

Appendix

Year 1 | Year 2 | Years 3 & 4

Proof of concept

- Built proof of concept CDS application
- Manually added data
- Drafted temporary agreements

Make it real

- Establish data model
- Establish data integration infrastructure
- Initiate data sharing agreements
- Prepare for launch

Impact

Pre-launch

- Expand feature improvements
- Expand data catalog
- Establish production-level data pipelines
- Establish governance structure
- Establish user support services

Launch!

Post-launch

- Outreach to establish user base
- Proactive use of analytic services
- Science directed Program Governance
- User feedback, system refinement, bug fixes
- Assess impact

CDS

- Population-oriented exploration of clinical and pre-clinical CAVD, AVEG, HVTN data, areas of study
- Data, statistical, outreach and user support services

ImmuneSpace

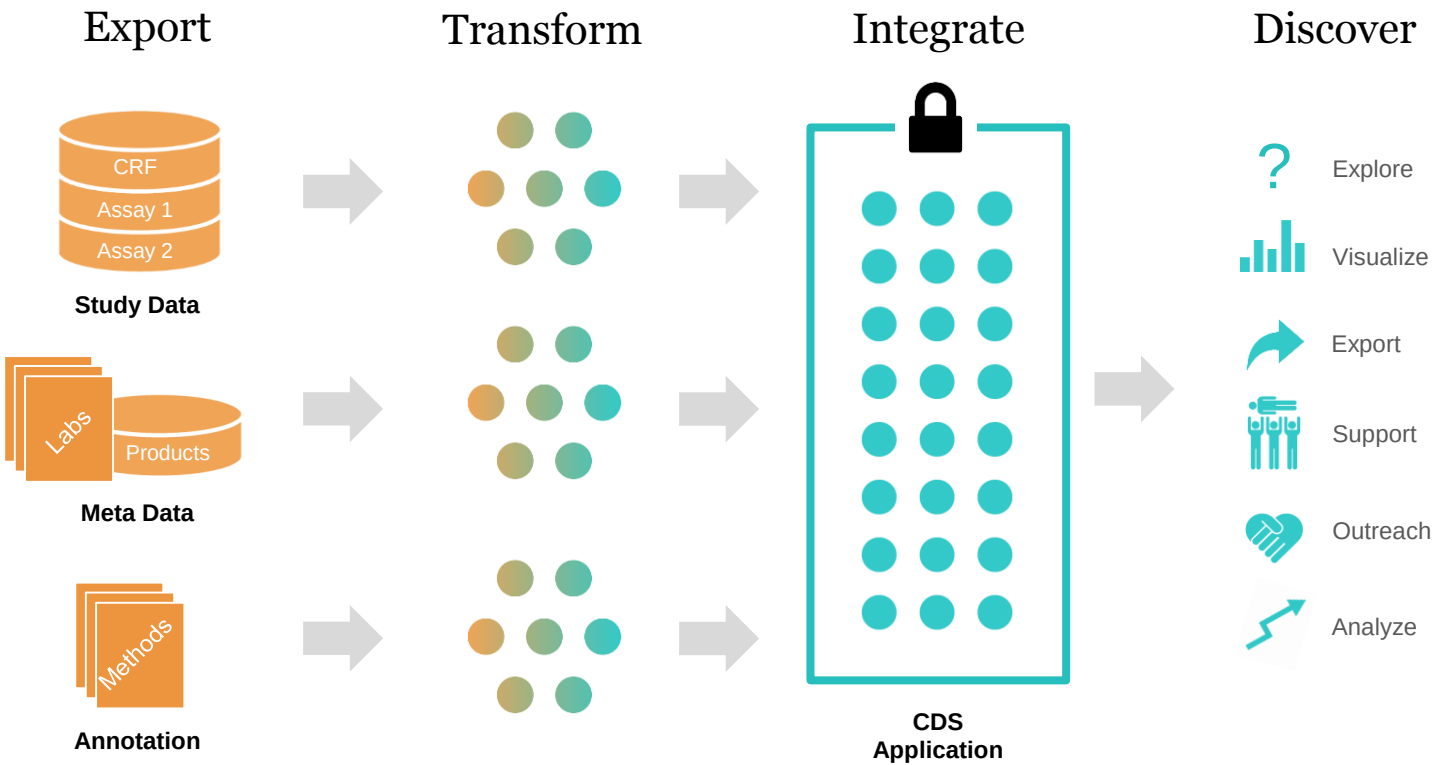
- Analytic front-end over integrated ImmPort data, including rich tools for specialized analyses
- Systems biology approach to high-dimensional/high-throughput data; e.g., gene expression

Atlas

- Operations-oriented portal for SCHARP networks focused on data acquisition
- Study and dataset-based sharing with light analytics

ImmPort

- Repository for data generated and submitted by NIAID/DAIT investigators
- Focus on data standardization and curation, with a handful of analytic tools for selected data types


Export
Transform
Integrate
Discover
CRF
Assay 1
Assay 2
Study Data
Labs
Products
Meta Data
Methods
Annotation
CDS Application
Explore
Visualize
Export
Support
Outreach
Analyze