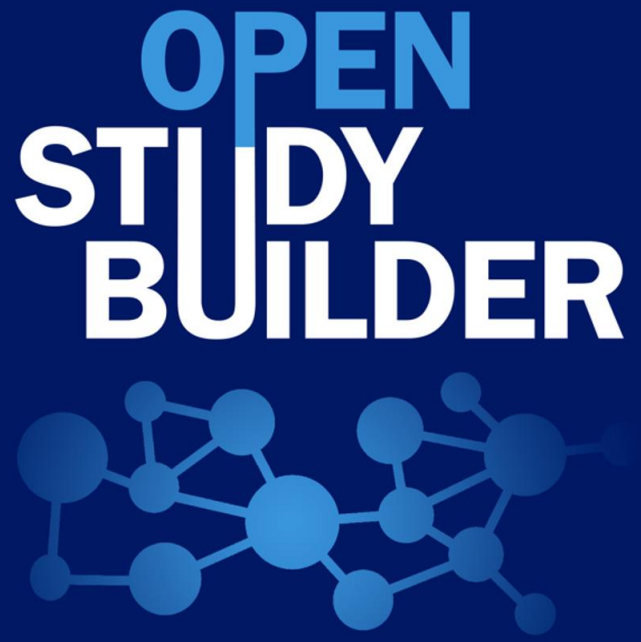
Open-Source MDR and SDR

The OpenStudyBuilder as a new Metadata Repository solution



Paris, Tuesday 21 November 2023

Katja Glass – Katja Glass Consulting

Nicolas de Saint Jorre – Novo Nordisk

What is the OpenStudyBuilder?...

A NEW APPROACH TO STUDY SPECIFICATION

- Compliance with external and internal standards
- Facilitates automation and content reuse
- Ensures a higher degree of end-to-end consistency

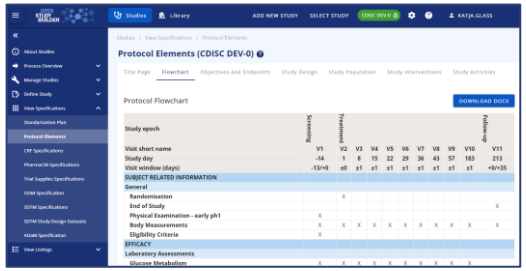
3 ELEMENTS OF OpenStudyBuilder

- **Clinical Metadata Repository (clinical MDR)**
  (central repository for all study specification data)
- **OpenStudyBuilder application / Web UI**
- **API layer**
  (allowing interoperability with other applications)
  (DDF API Adaptor – enabling DDF SDR Compatibility)

clinical **MDR**

What's in ?

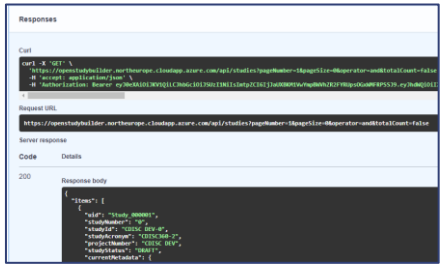
Application



Neo4j database

- Including example data

API

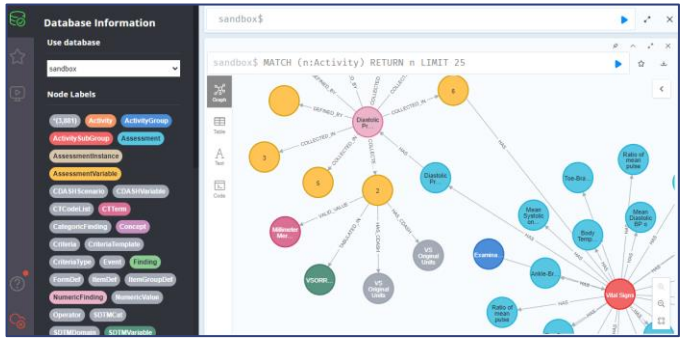


Documentation

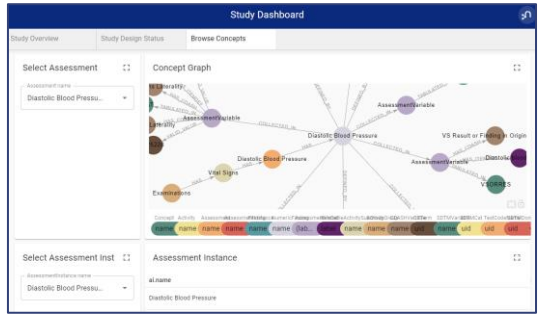
- Project Homepage
- Tool documentation
- GitLab documentation
  - Database design
  - Architecture design
  - Instructions

Scripts

DB Browser



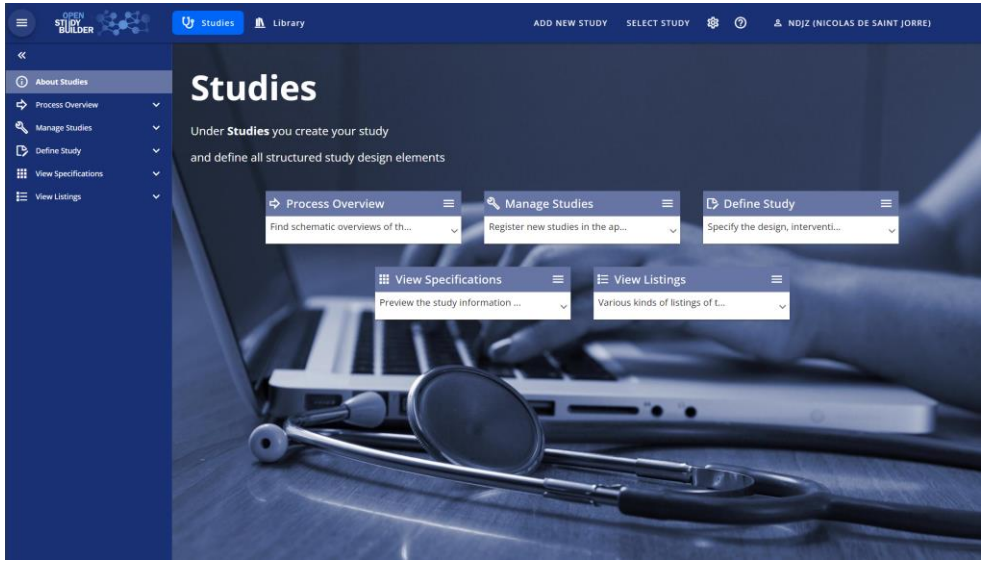
Neo4j dashboard*



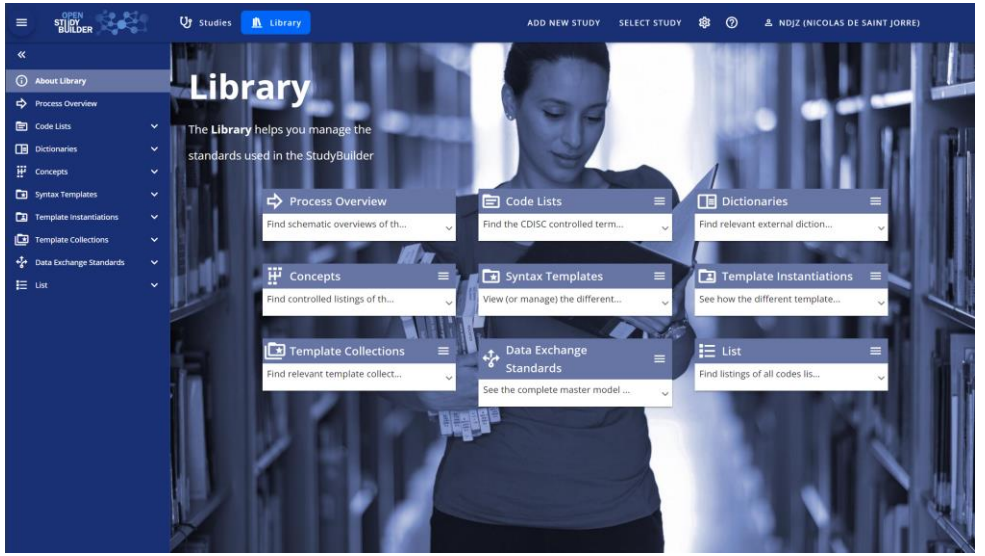
*available in sandbox, can be installed on other environments

OpenStudyBuilder Components

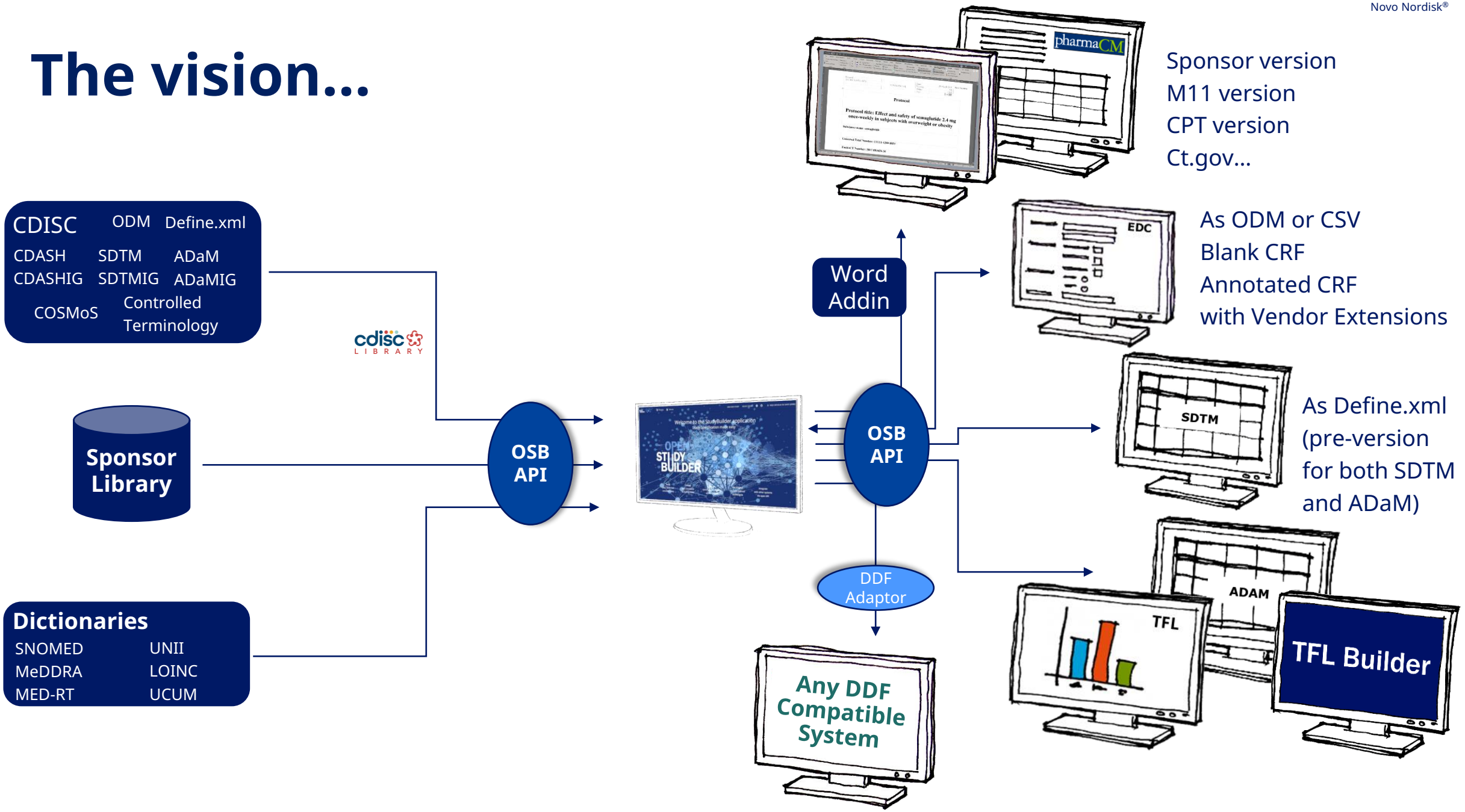
STUDIES	
TITLE	CRITERIA
REGISTRY IDENTIFERS	INTERVENTIONS
STRUCTURE	PURPOSE
POPULATION	ACTVITIES



LIBRARY	
CONTROLLED TERMINOLOGY	MEDICAL DICTIONARIES (e.g., MedDRA)
CONCEPTS (ACTIVITIES, UNITS, CRFs, COMPOUNDS)	TEMPLATES
DATA EXCHANGE STANDARDS	



The vision…

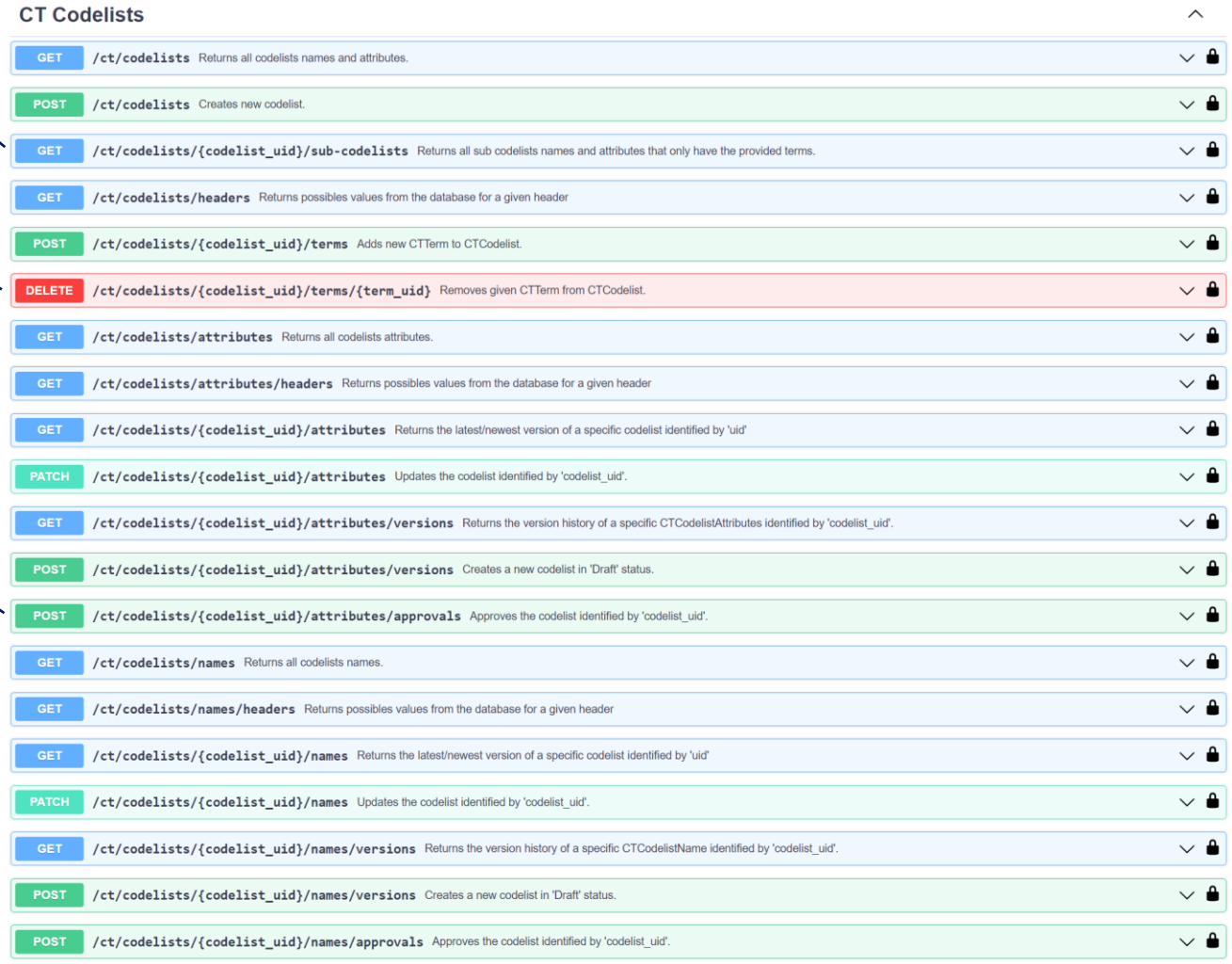

CDISC
ODM
Define.xml
CDASH
SDTM
ADaM
CDASHIG
SDTMIG
ADaMIG
COSMoS
Controlled Terminology
cdisc LIBRARY
Sponsor Library
Dictionaries
SNOMED
UNII
MeDDRA
LOINC
MED-RT
UCUM
OSB API
OSB API
Word Addin
DDF Adaptor
Any DDF Compatible System
pharmaCM
Sponsor version
M11 version
CPT version
Ct.gov…
EDC
As ODM or CSV
Blank CRF
Annotated CRF
with Vendor Extensions
SDTM
As Define.xml
(pre-version
for both SDTM
and ADaM)
ADAM
TFL
TFL Builder

Example of API endpoints to manage CDISC CT

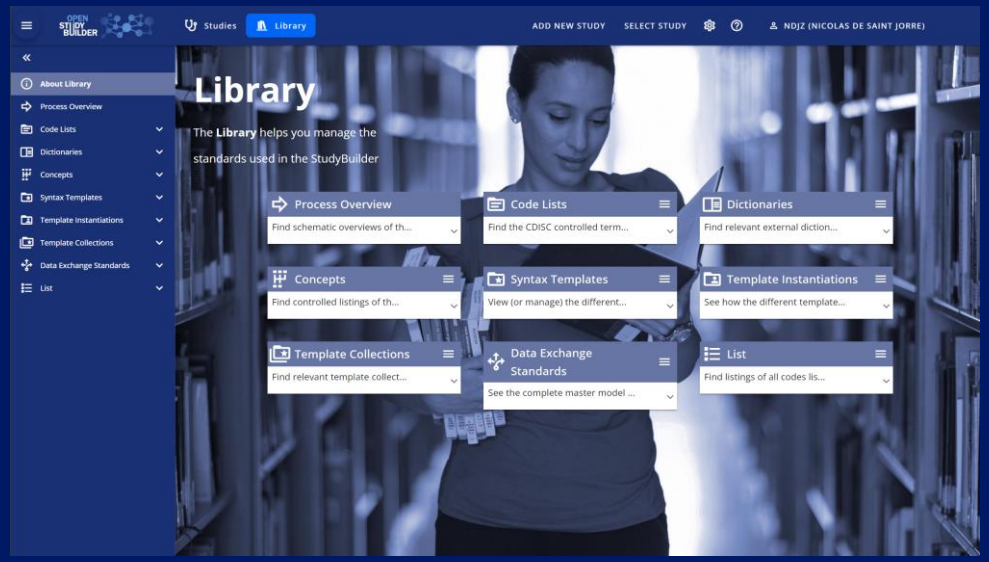
To Get metadata

To Delete metadata (soft delete)

To Modify metadata

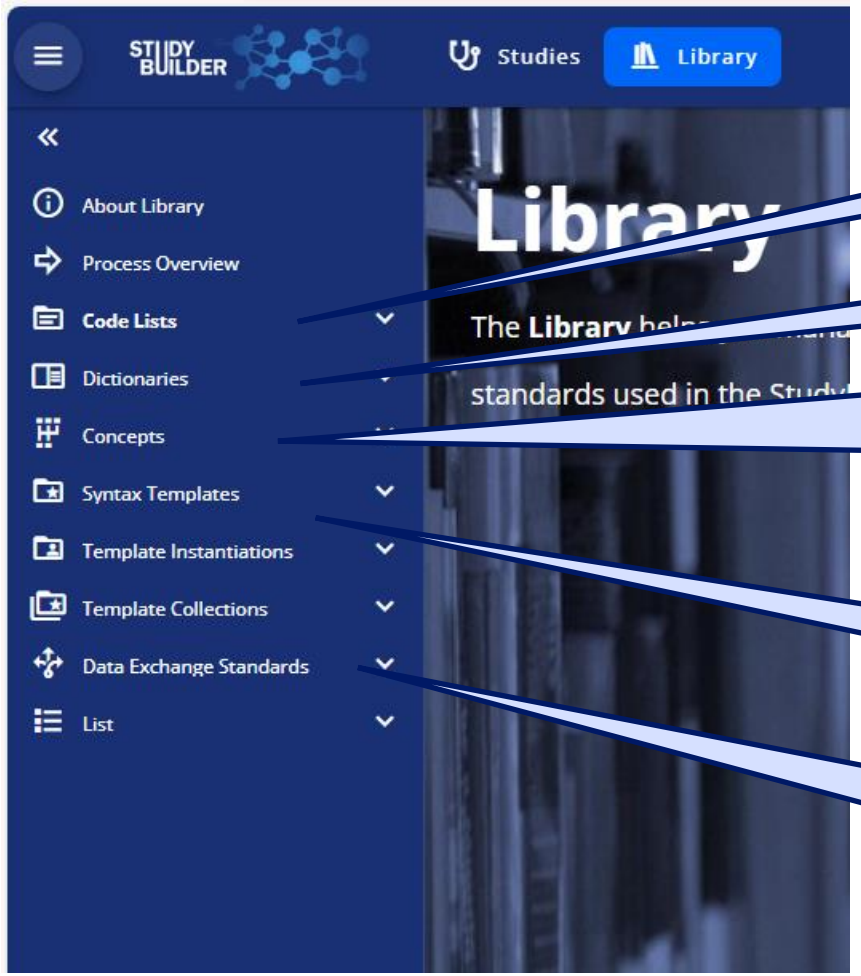


Library



LIBRARY	
CONTROLLED TERMINOLOGY	MEDICAL DICTIONARIES (e.g., MedDRA)
CONCEPTS (ACTIVITIES, UNITS, CRFs, COMPOUNDS)	TEMPLATES
DATA EXCHANGE STANDARDS	

Library content



Code Lists := CTTerm
CDISC + Sponsor

Dictionaries
Subset of values & dictionaries

Concepts
Activities, Compounds and Units
(legacy migration)
CRF (PoC)

Syntax Templates
Objectives, Endpoints, Criteria,
Activities, Footnotes

Data Exchange Standards
From CDISC Library + Sponsor extensions

About Library
Process Overview
Code Lists
Dashboard
CT Catalogues
CT Packages
CDISC
Sponsor
Dictionaries
Concepts
Syntax Templates
Template Instantiations
Template Collections
Data Exchange Standards
List

Code list C66737 - TPHASE / Term Detail (Concept ID: C15602_PHASE__III__TRIAL)

For all terminologies we include the option to define the sponsor preferred name, in UK spelling, in Title and sentence case

In this case, we can use Arabic numbers as a synonym in the protocol template for study phase

Code List Summary

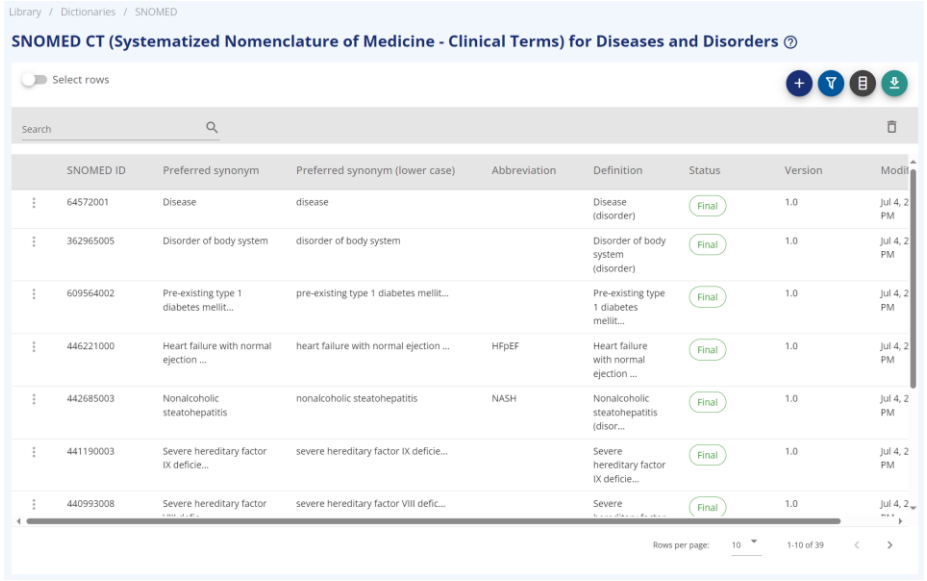
For the term sponsor values

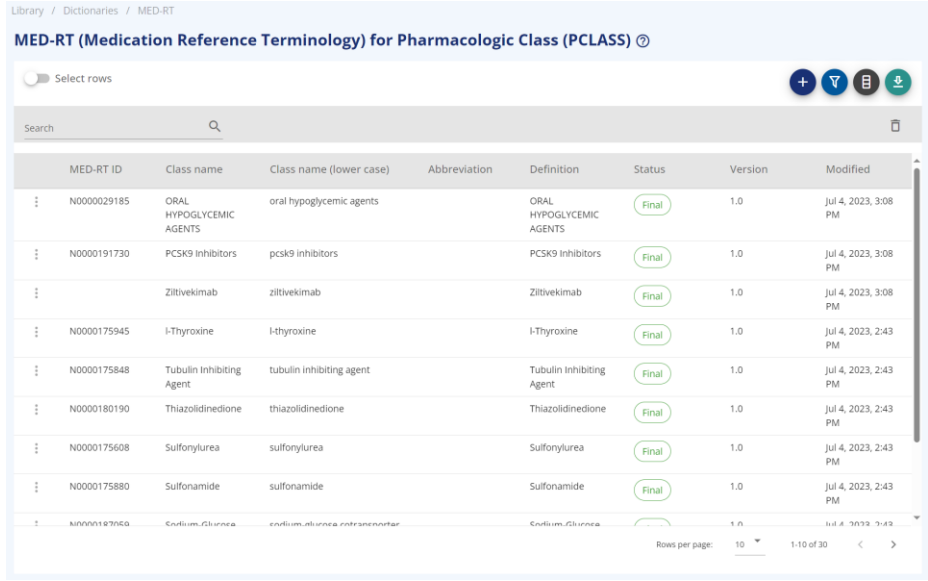
CT identifiers	Selected values	Status	Modified	Version	Actions
Sponsor Preferred Name	3	Final	Oct 19, 2023, 11:06 PM	2.0	
Sentence case name	3				
Order	3				

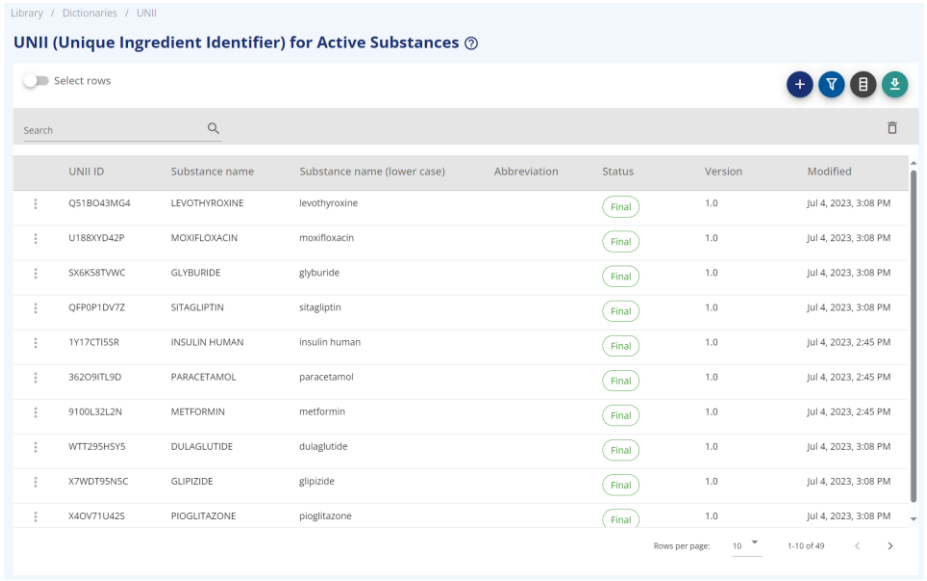
For the code list attributes values

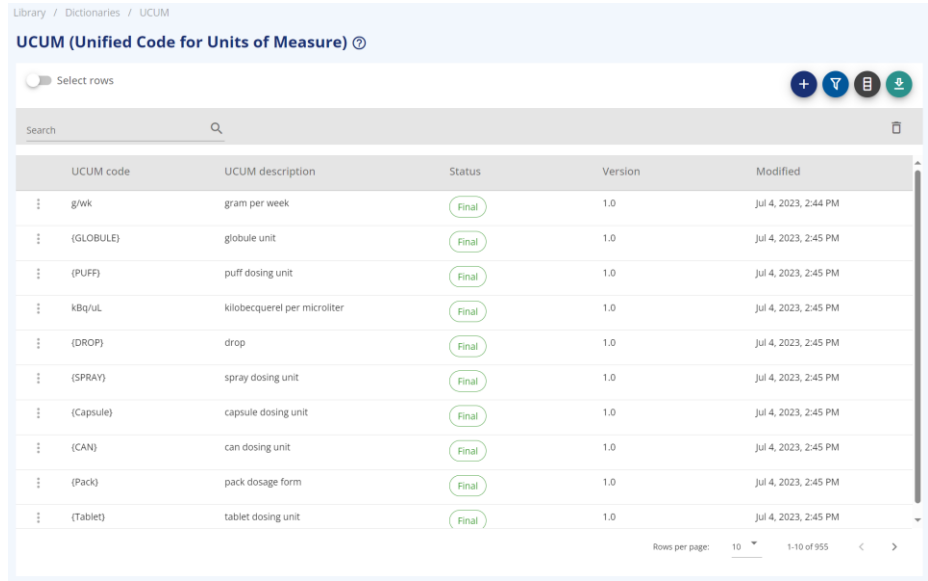
CT identifiers	Selected values	Status	Modified	Version	Actions
Concept ID	C15602_PHASE__III__TRIAL	Final	Mar 31, 2023, 2:00 AM	2.0	
Name submission value					
Code submission value	PHASE III TRIAL				
NCI preferred name	Phase III Trial				
Definition	Phase that includes the controlled clinical trials intended to confirm safety and effectiveness, evaluate the overall benefit-risk relationship, and to provide substantial				

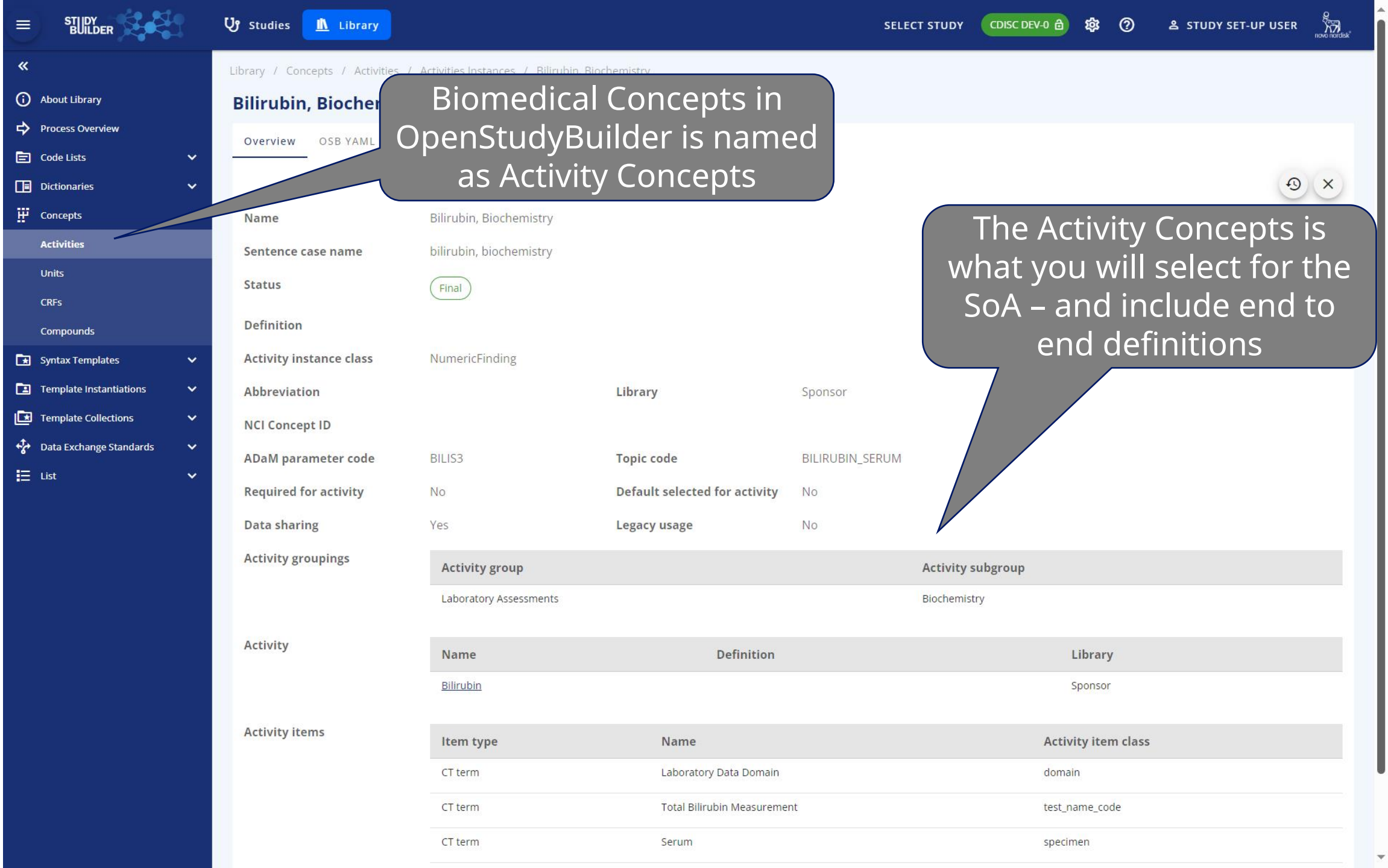
Dictionaries










STUDY BUILDER
Studies
Library
SELECT STUDY
CDISC DEV-0
STUDY SET-UP USER
About Library
Process Overview
Code Lists
Dictionaries
Concepts
Activities
Units
CRFs
Compounds
Syntax Templates
Template Instantiations
Template Collections
Data Exchange Standards
List
Library / Concepts / Activities / Activities Instances / Bilirubin, Biochemistry
Bilirubin, Biocher
Overview
OSB YAML
Biomedical Concepts in OpenStudyBuilder is named as Activity Concepts
The Activity Concepts is what you will select for the SoA – and include end to end definitions
Name
Bilirubin, Biochemistry
Sentence case name
bilirubin, biochemistry
Status
Final
Definition
Activity instance class
NumericFinding
Abbreviation
Library
Sponsor
NCI Concept ID
ADaM parameter code
BILIS3
Topic code
BILIRUBIN_SERUM
Required for activity
No
Default selected for activity
No
Data sharing
Yes
Legacy usage
No
Activity groupings
Activity group
Activity subgroup
Laboratory Assessments
Biochemistry
Activity
Name
Definition
Library
Bilirubin
Sponsor
Activity items
Item type
Name
Activity item class
CT term
Laboratory Data Domain
domain
CT term
Total Bilirubin Measurement
test_name_code
CT term
Serum
specimen

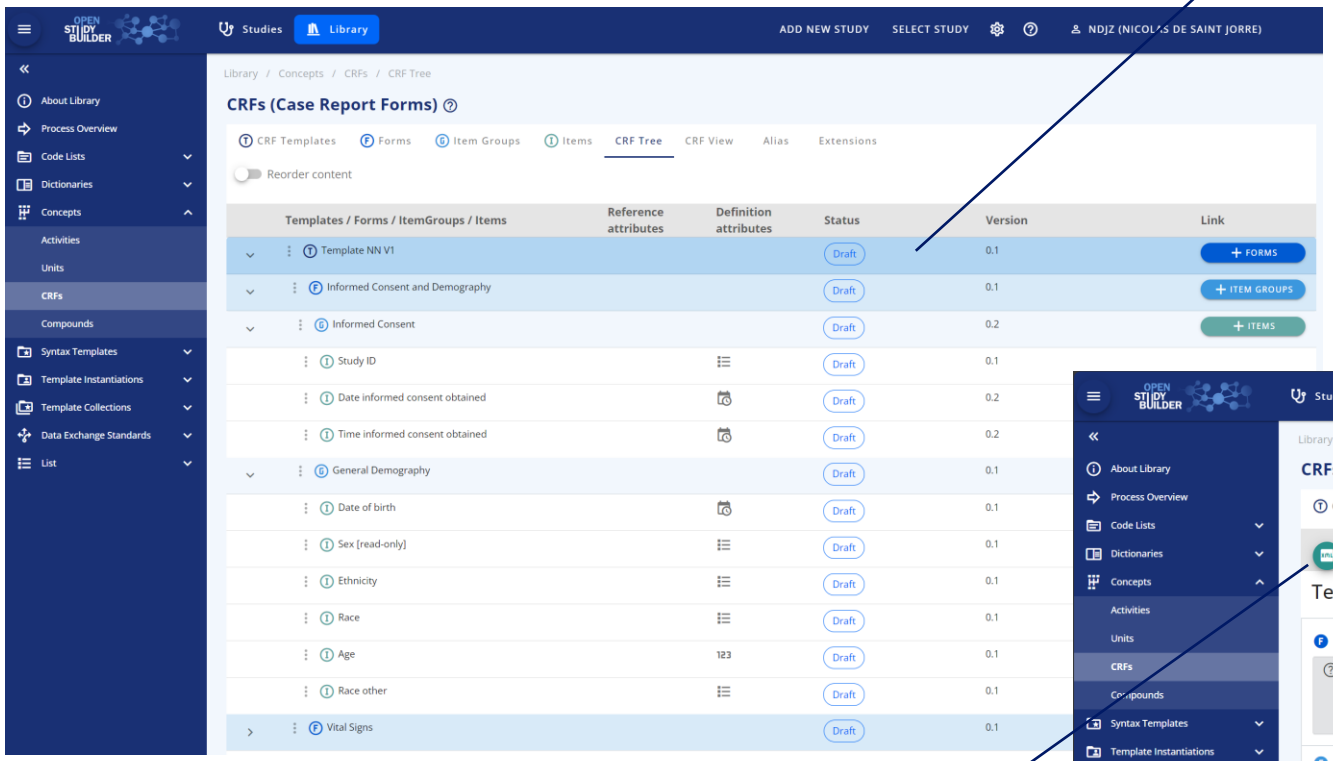
Concept: CRFs

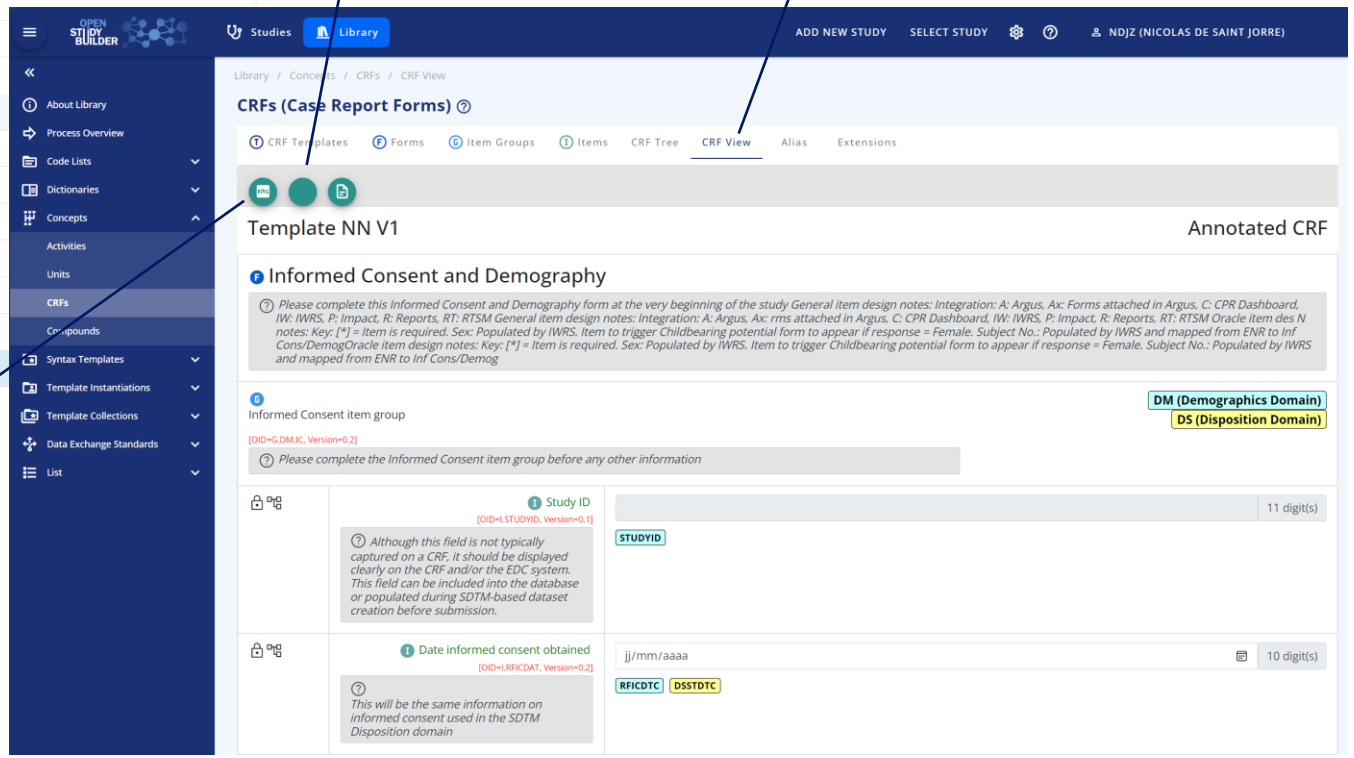
Templates used to defined multiple CRF version

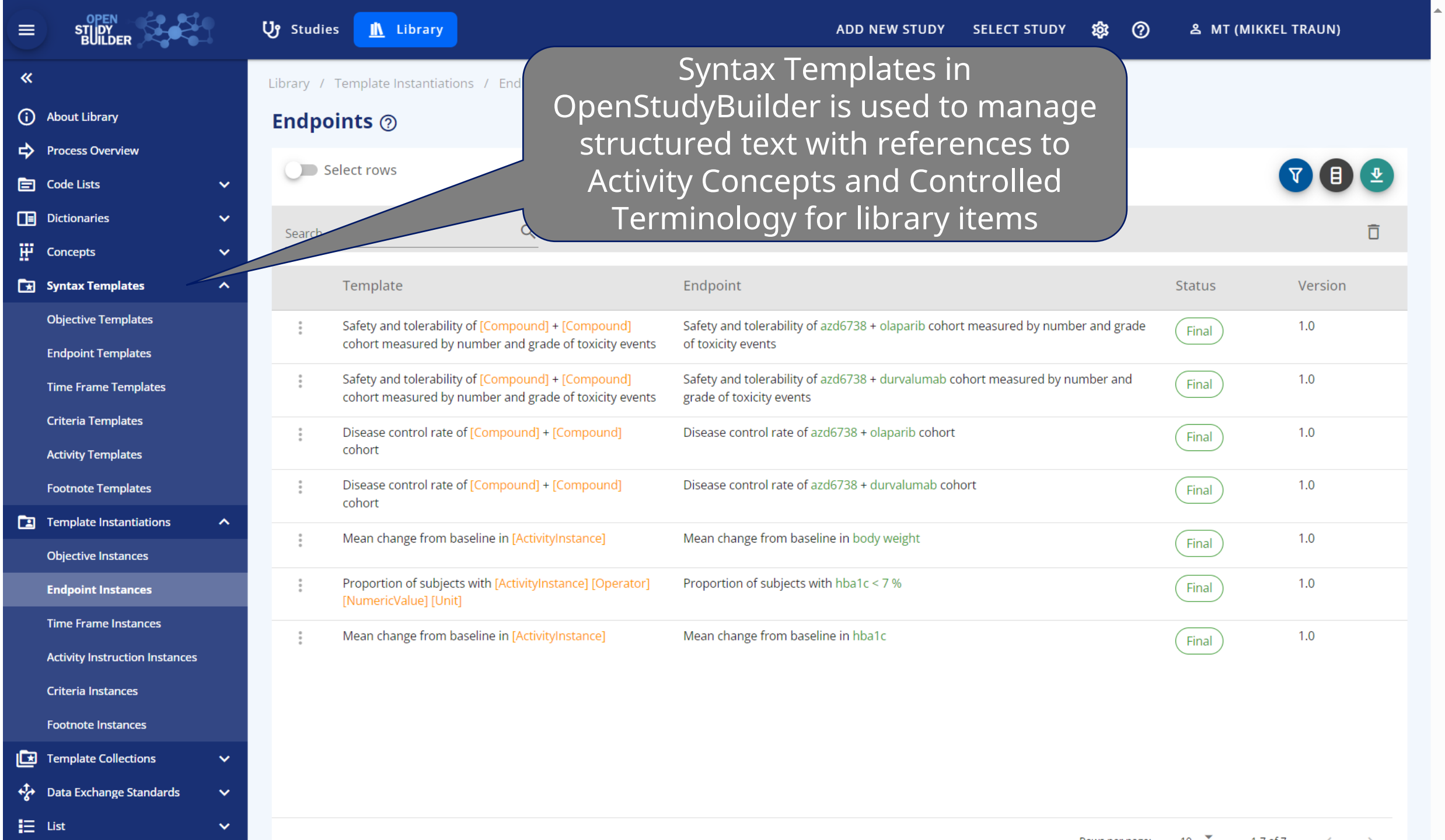
Blank or Annotated CRF following MSG 2.0 standard

PDF format

ODM.xml with vendor extensions (or CSV)






Studies
Library
ADD NEW STUDY
SELECT STUDY
MT (MIKKEL TRAUN)
Syntax Templates in OpenStudyBuilder is used to manage structured text with references to Activity Concepts and Controlled Terminology for library items
About Library
Process Overview
Code Lists
Dictionaries
Concepts
Syntax Templates
Objective Templates
Endpoint Templates
Time Frame Templates
Criteria Templates
Activity Templates
Footnote Templates
Template Instantiations
Objective Instances
Endpoint Instances
Time Frame Instances
Activity Instruction Instances
Criteria Instances
Footnote Instances
Template Collections
Data Exchange Standards
List
Library / Template Instantiations / End
Endpoints
Select rows
Search
Template
Endpoint
Status
Version
Safety and tolerability of [Compound] + [Compound] cohort measured by number and grade of toxicity events
Safety and tolerability of azd6738 + olaparib cohort measured by number and grade of toxicity events
Final
1.0
Safety and tolerability of [Compound] + [Compound] cohort measured by number and grade of toxicity events
Safety and tolerability of azd6738 + durvalumab cohort measured by number and grade of toxicity events
Final
1.0
Disease control rate of [Compound] + [Compound] cohort
Disease control rate of azd6738 + olaparib cohort
Final
1.0
Disease control rate of [Compound] + [Compound] cohort
Disease control rate of azd6738 + durvalumab cohort
Final
1.0
Mean change from baseline in [ActivityInstance]
Mean change from baseline in body weight
Final
1.0
Proportion of subjects with [ActivityInstance] [Operator] [NumericValue] [Unit]
Proportion of subjects with hba1c < 7 %
Final
1.0
Mean change from baseline in [ActivityInstance]
Mean change from baseline in hba1c
Final
1.0

Manage Protocol Standard Texts

- Objectives
- Endpoints
- Criteria

- Re-usability
- Standardization
- Search capabilities

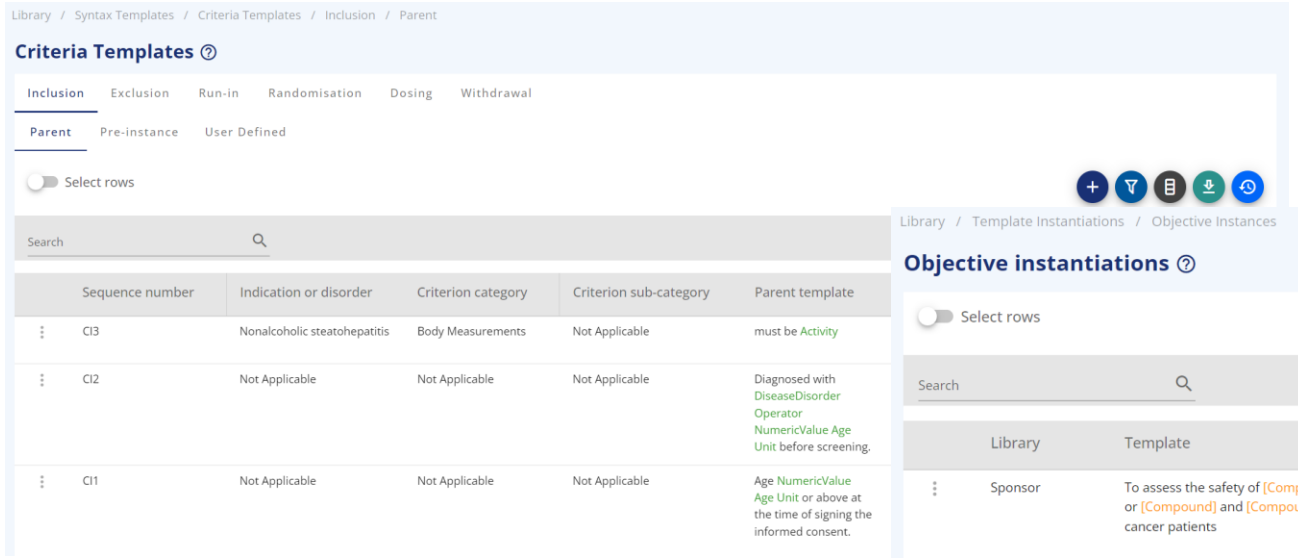
Objective
To compare the effect of [Compound] relative to [Comparator] on [ActivityInstance]

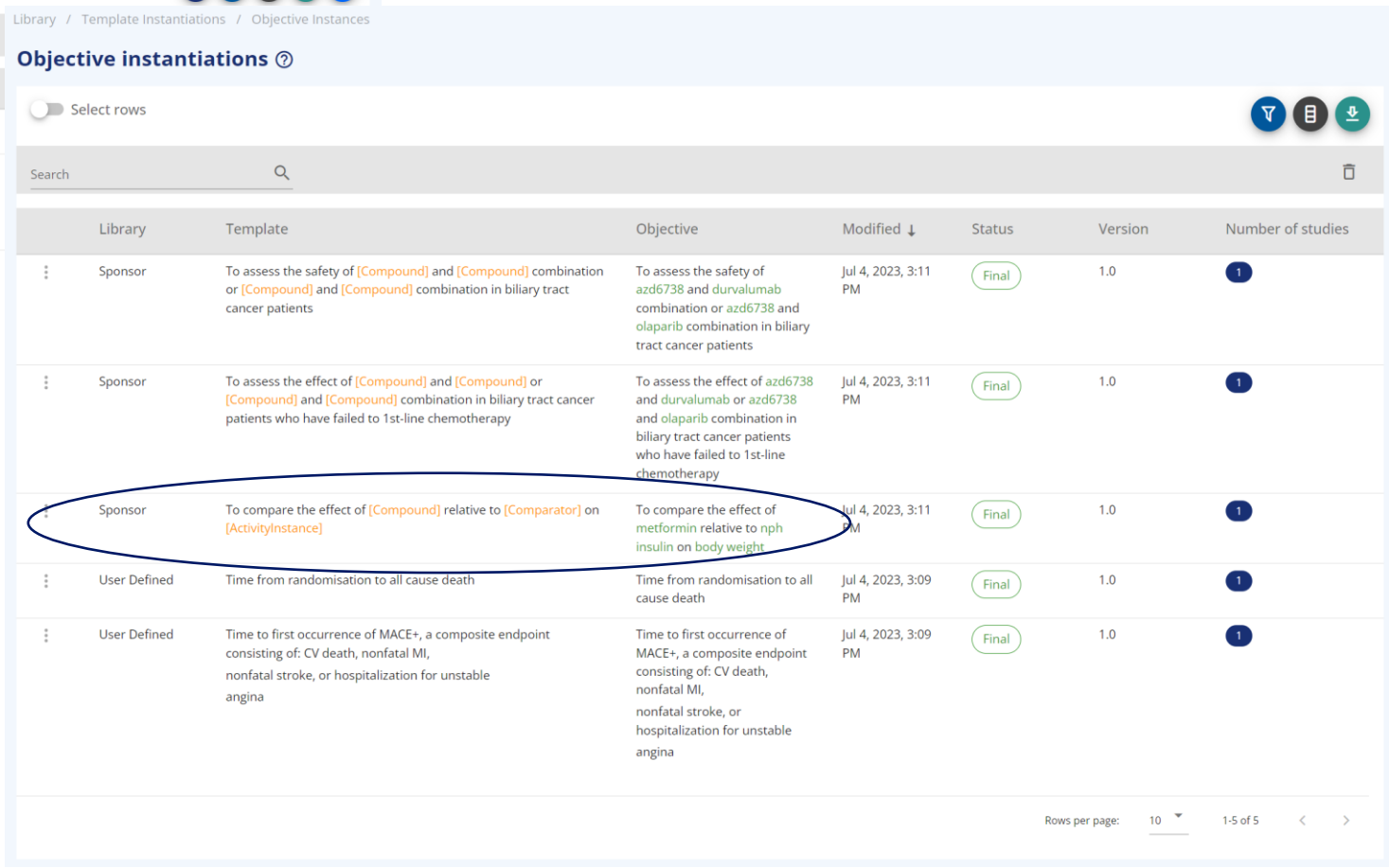
Endpoint
Occurrence of [Activity] (yes/no)

Endpoint
Mean change from baseline in [ActivityInstance]

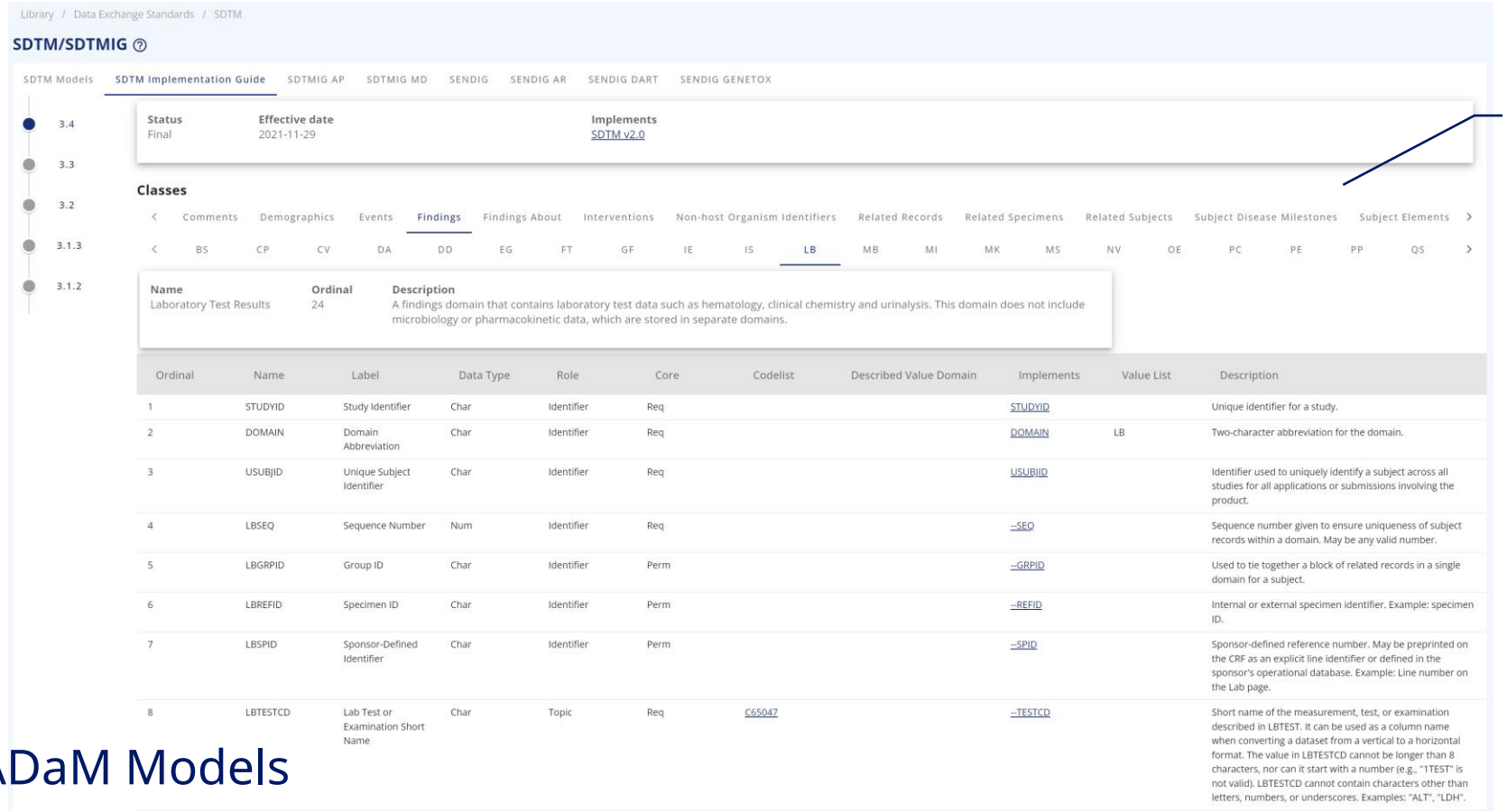
Criteria
Age [NumericValue] [Age Unit] or above at the time of signing the informed consent.

Syntax Templates and Instanciations





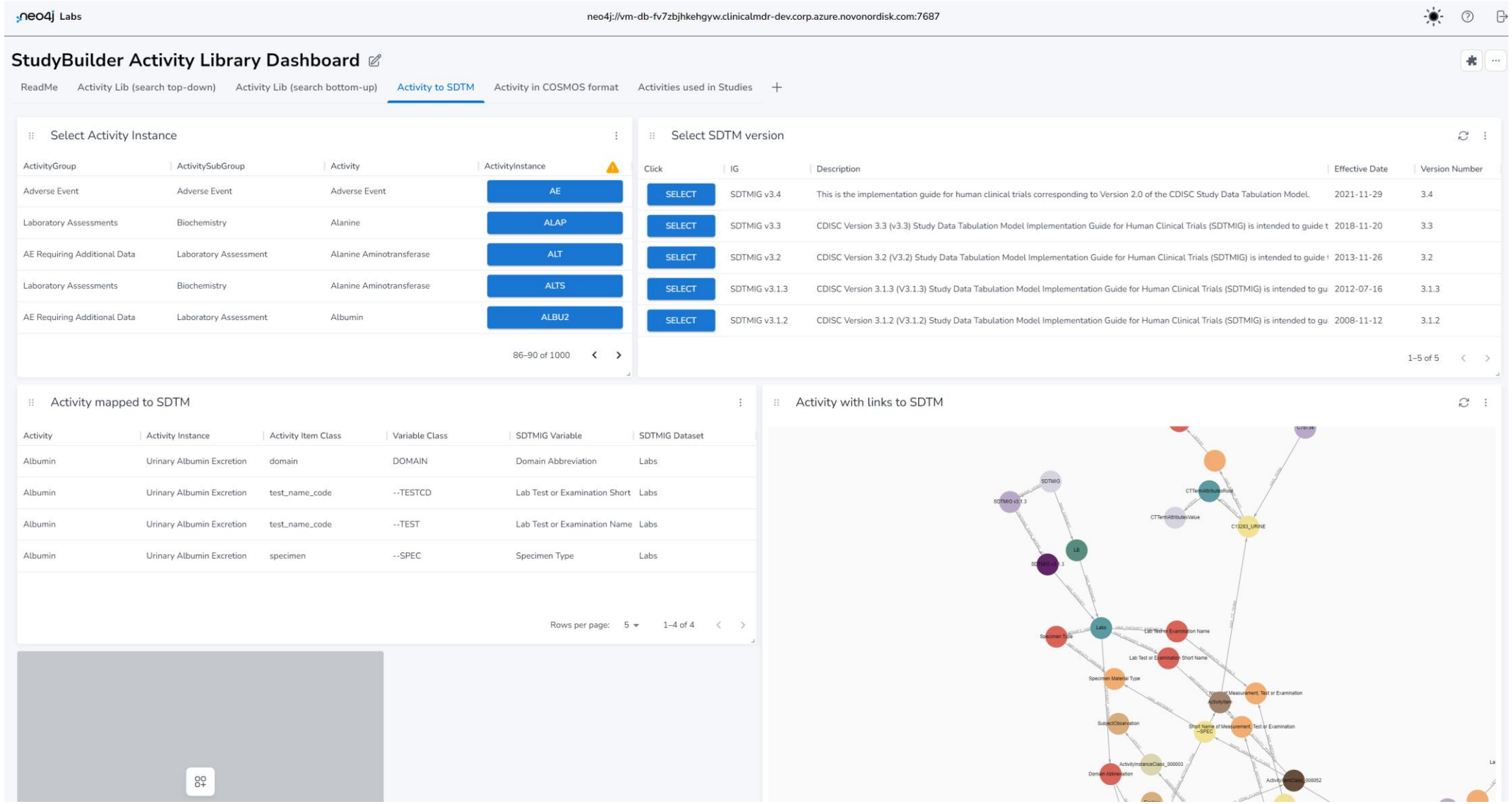
Data Exchange Standards – CDISC Models



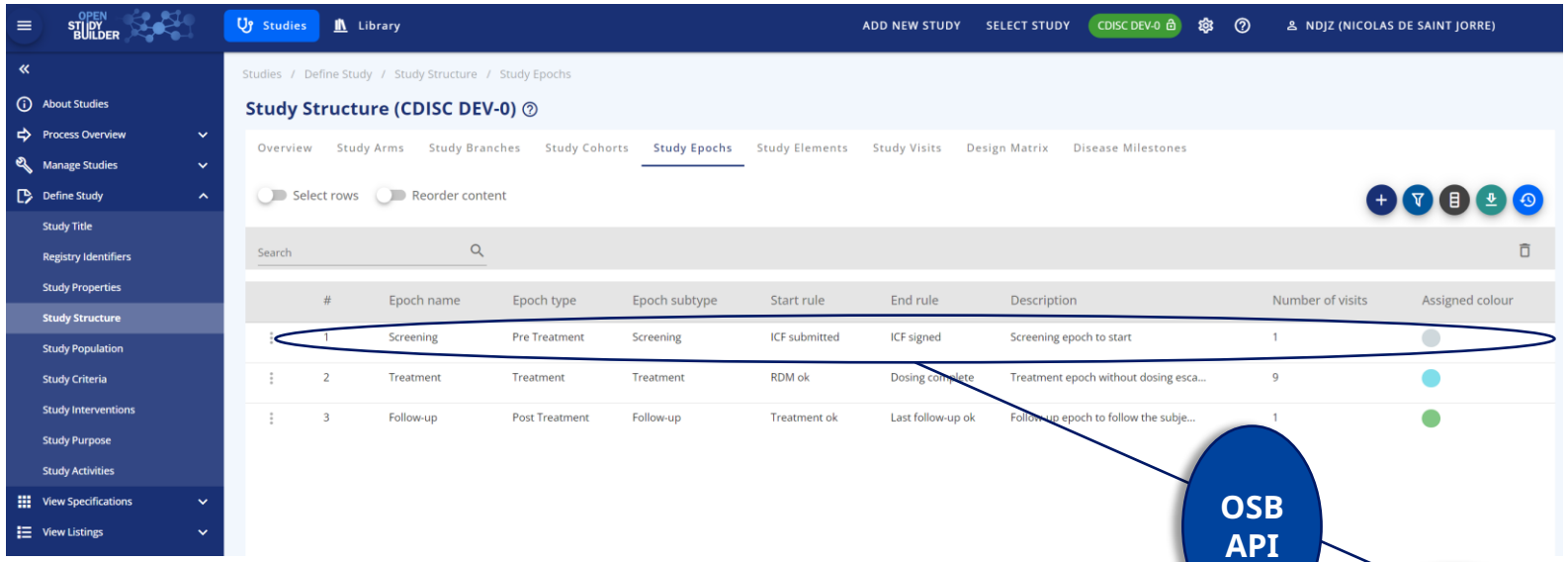
Importing Models from the CDISC Library with Version Control + Sponsor additional metadata

CDASH and ADaM Models will be added soon…

NeoDash reports to view Activity to SDTM Variables

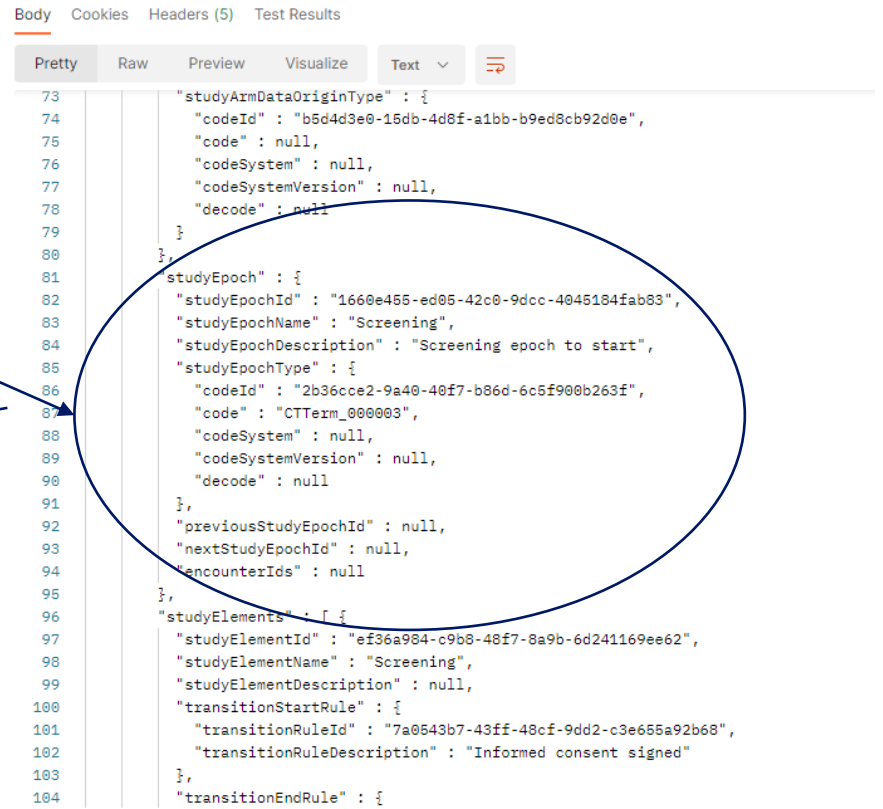


Digital Data Flow Adaptor (TransCelerate DDF)

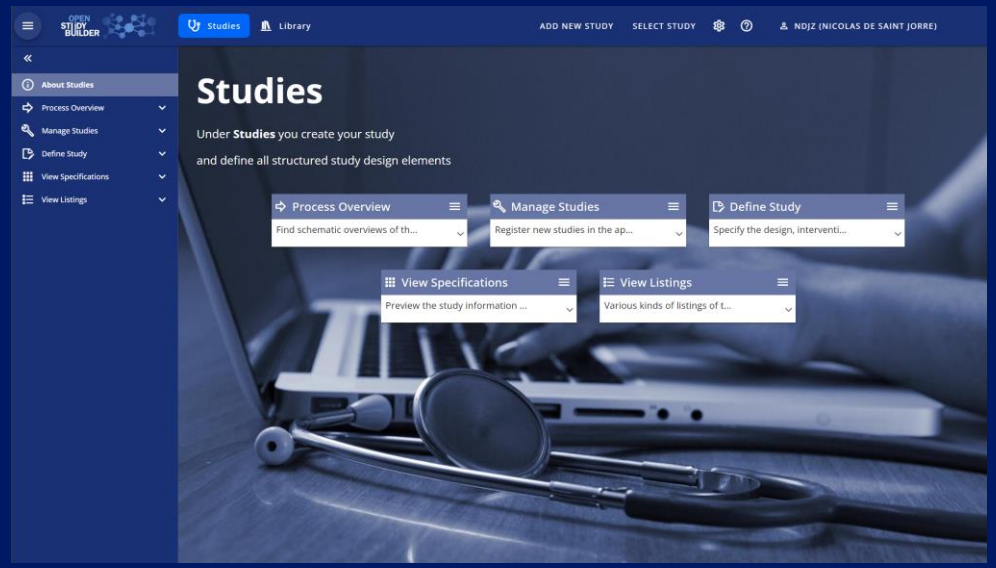


accenture

Microsoft



Study Protocol



STUDIES	
TITLE	CRITERIA
REGISTRY IDENTIFERS	INTERVENTIONS
STRUCTURE	PURPOSE
POPULATION	ACTVITIES

Manage Studies

- Enter study information
  - Title, Description, Objectives, Endpoints, Criteria, Schedule of Activities …

- Reuse in Protocol (and more)

About Studies
Process Overview
Manage Studies
Define Study
View Specifications
Protocol Elements
SDTM Study Design Datasets
View Listings

Protocol Elements (CDISC DEV-0)

Title Page | Protocol SoA | Objectives and Endpoints | Study Design | Study Population | Study Interventions | Study Activities

Title Page Information

Title page elements	Values
Protocol title	My first study
Protocol short title	my first study short title
Substance name	NPH Insulin
Universal Trial Number	
EudraCT number	2019-123456-42
IND number	
Study phase	3

The Studies module support
- general study attributes
- study design
- study criteria
- study SoA

And preview of structured protocol content

Studies / Define Study / Study Activities / Detailed SoA

About Studies
Process Overview
Manage Studies
Define Study
Study Title
Registry Identifiers
Study Properties
Study Structure
Study Population
Study Criteria
Study Interventions
Study Purpose
Study Activities
View Specifications
View Listings

Study Activities (CDISC DEV-0)

Study Activities | Study Activity Instances | Detailed SoA | SoA footnotes | Protocol SoA | Activity Instructions

The detailed SoA describe scheduling of the specific Activities and their grouping for the study

roups

Activities	Window	Screening V1	Treatment V2	V3	V4	V5	V6	V7	V8	V9	V10	Follow-up V11
		-14	1	8	15	22	29	36	43	57	183	213
		-13/+0	±0	-1/+1	-1/+1	-1/+1	-1/+1	-1/+1	-1/+1	-1/+1	-1/+1	0/+35
SUBJECT RELATED INFORMATION												
EFFICACY												
Laboratory Assessments												
Glucose Metabolism												
HbA1c		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○
Self Measured Plasma Glucose												
Self Measured Plasma Glucose												
Mean Plasma Glucose		○	○	○	○	○	○	○	○	○	○	○
SAFETY												

Each level in the Activity hierarchy can be selected for display in the “Protocol SoA”

About Studies
Process Overview
Manage Studies
Define Study
Study Title
Registry Identifiers
Study Properties
Study Structure
Study Population
Study Criteria
Study Interventions
Study Purpose
Study Activities
View Specifications
View Listings

Study Activities (CDISC DEV-0)

Study Activities | Study Activity Instances | Detailed SoA | SoA footnotes | Protocol SoA | Activity Instructions

Produce a copy of the SoA compatible with Word

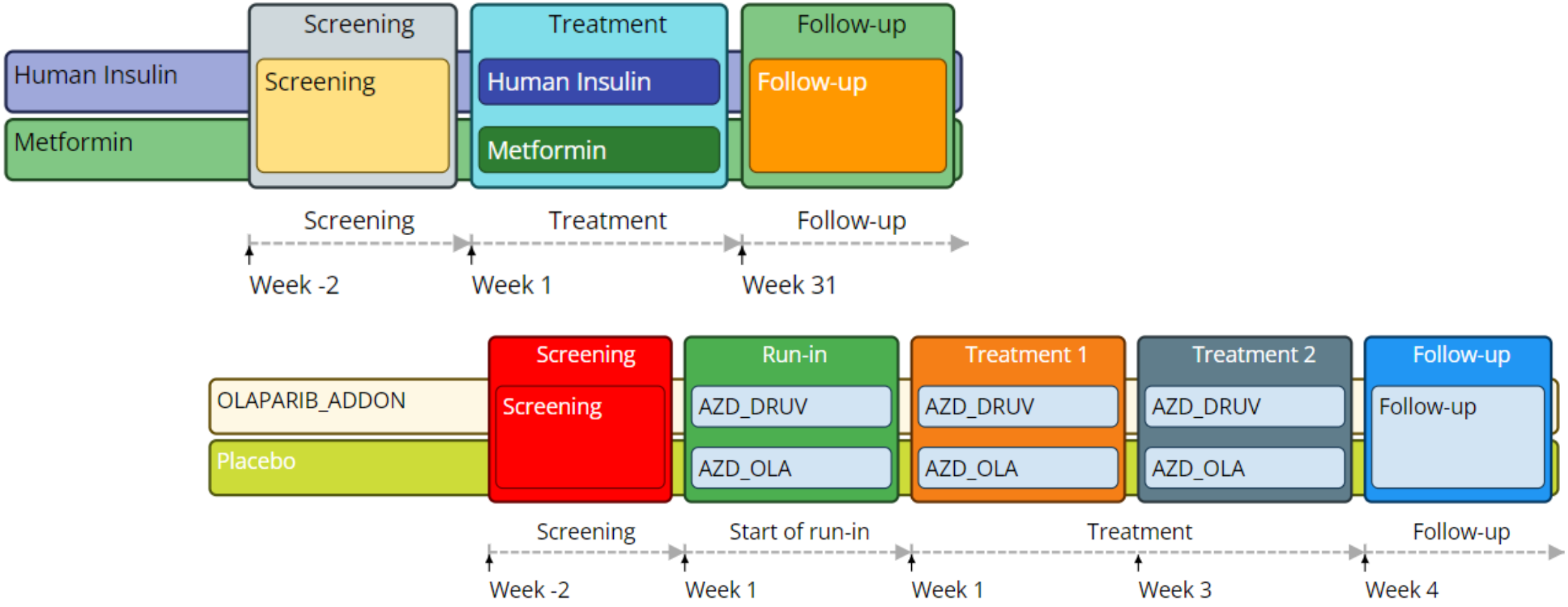
The "Protocol SoA" only displaying the selected activity level of detail as a preview

Protocol SoA

DOWNLOAD DOCX

Procedure	Screening	Treatment									Follow-up
Visit short name	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11
Study day	-14	1	8	15	22	29	36	43	57	183	213
Visit window (days)	-13/+0	±0	±1	±1	±1	±1	±1	±1	±1	±1	+0/+35
Randomisation											
Randomisation		X									
End of Study											
End of Study											X
Body Measurements											
Body Measurements	X	X	X	X	X	X	X	X	X	X	X
Eligibility Criteria											
Eligibility Criteria	X										
Laboratory Assessments											
Glucose Metabolism	X	X	X	X	X	X	X	X	X	X	
Lipids	X	X			X			X		X	
Biochemistry	X	X			X			X		X	
AE Requiring Additional Data											
Laboratory Assessment	X	X			X			X		X	
Adverse Event											
Adverse Event	X	X	X	X	X	X	X	X	X	X	X
Vital Signs											
Vital Signs	X	X	X	X	X	X	X	X	X	X	X
Medical History/Concomitant Illness											
Medical History/Concomitant Illness	X	X	X	X	X	X	X	X	X	X	X

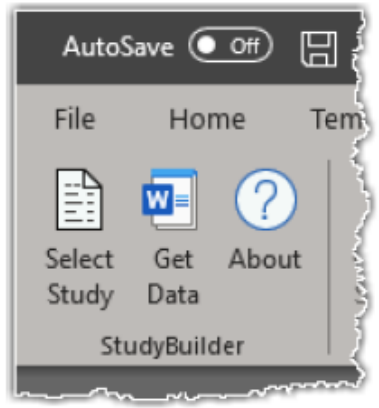
Study Design



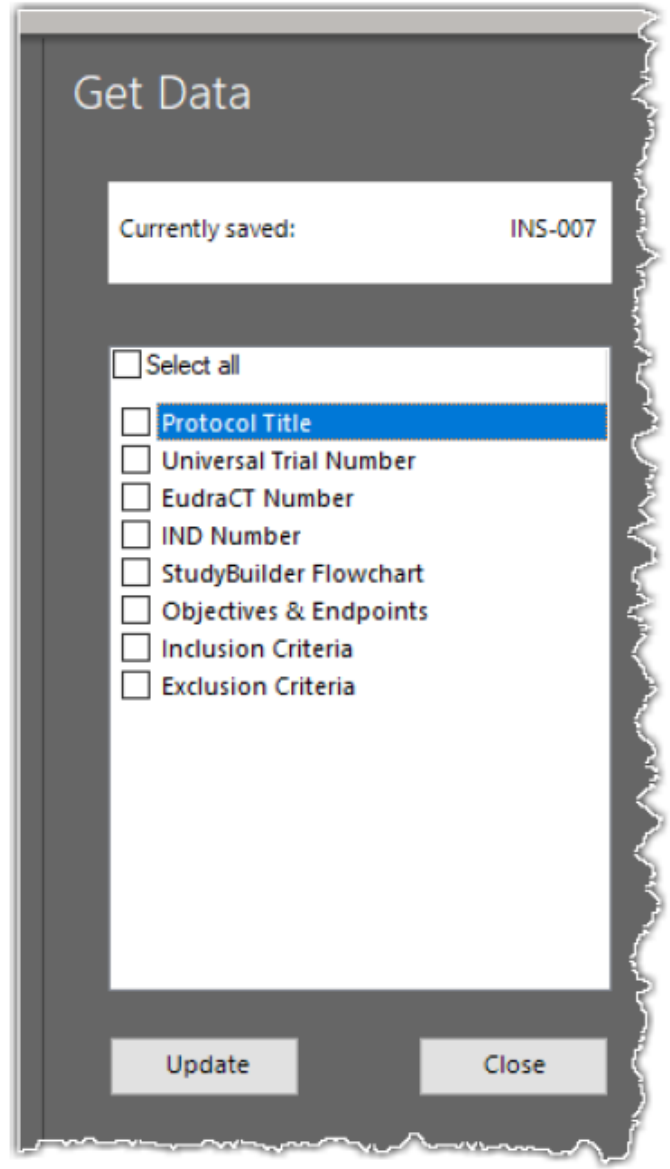
StudyBuilder ribbon
(Word add-in)

- ✓ One-way connection

- ✓ Code recognizes the document type
- ✓ User-friendly ribbon and ‘fly-out’ in Word
- ✓ Styles ensure proper formatting in Word



Protocol



Protocol

This template is based on the *NN Authoring Master Template* and requires the **NN Authoring ribbon,** which you install (once) from the Software portal.

*To remove this guidance text, click it and tap Delete **twice**. To bulk remove all guidance text boxes in the document, use the NN Authoring ribbon: Document Fix > Remove Guidance Text.*

For template support and more information type: TemplateSupport/ in your browser

For explanation of the formatting and text conventions, see Instructions for Protocol Templates on page 2.

*To remove this guidance text box, click it and tap Delete **twice**.*

Protocol Title: Insert via the StudyBuilder ribbon.

The title must include the name of the investigational intervention(s), the condition being studied, the study population included and the primary purpose, and should not be longer than 300 characters, including spaces. Two studies must not have identical titles.

Study intervention name(s) must be consistent throughout the protocol and protocol-related documents. The investigational medicinal product name must comply with document *Q145046*. Consult HQ Regulatory Affairs and/or project vice president/project director for correct use of product/substance name(s)/devices.

*To remove this guidance text box, click it and tap Delete **twice**.*

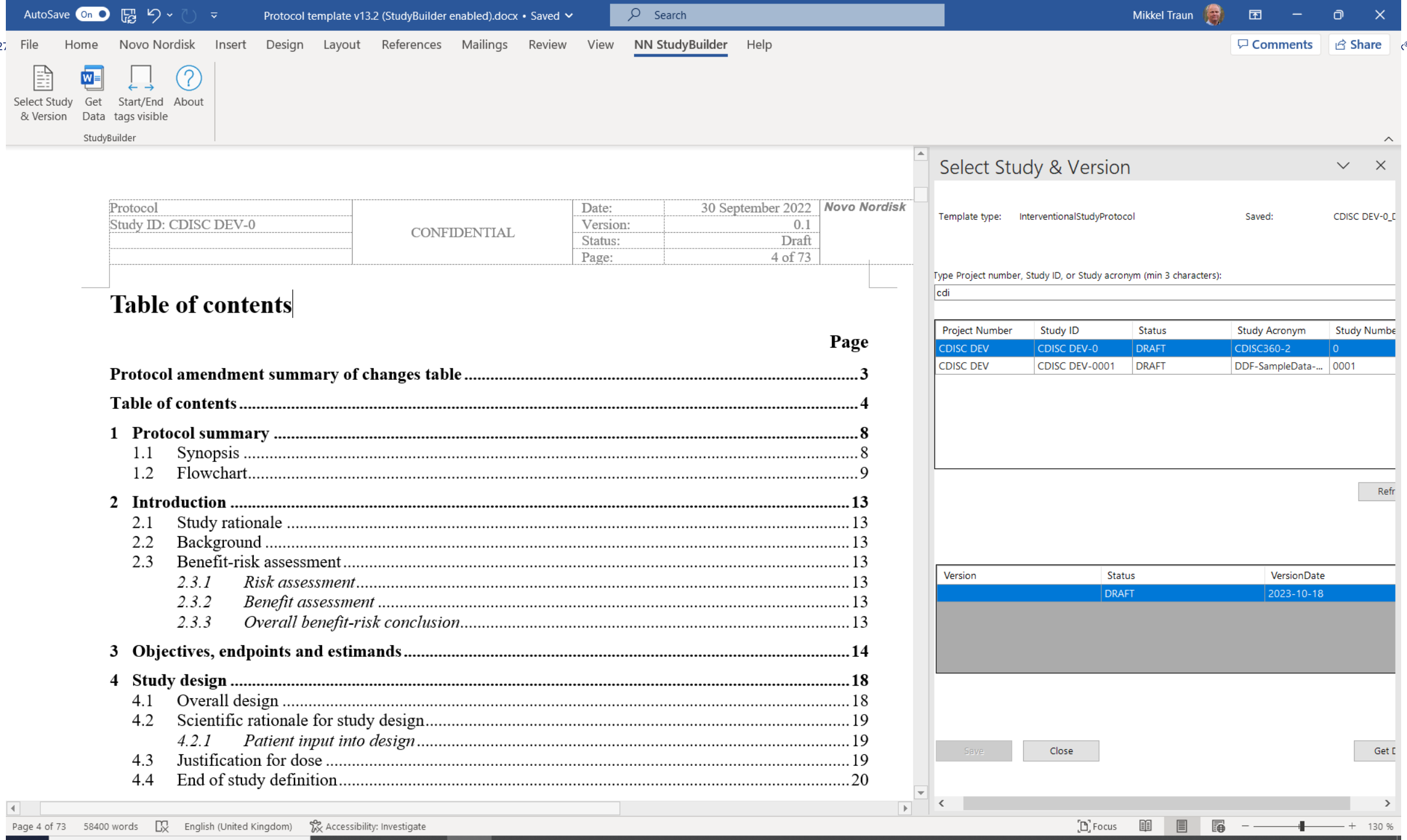
Short Title: Insert via the StudyBuilder ribbon.

Include a short title in lay language, to be aligned with the participant information/informed consent (PI/IC) title. Maximum 300 characters. For guidance on lay language titles please refer to the User guide on lay language titles in the PI/IC toolbox on SharePoint.

*To remove this guidance text box, click it and tap Delete **twice**.*

***Substance** Number / Name (as applicable):*

Protocol Version Number: Version *X*.0 *(add the version number that the protocol ultimately will*


AutoSave On
Protocol template v13.2 (StudyBuilder enabled).docx • Saved
Search
Mikkel Traun
File Home Novo Nordisk Insert Design Layout References Mailings Review View NN StudyBuilder Help
Comments Share
Select Study & Version
Get Data
Start/End tags visible
About
StudyBuilder
Protocol
Study ID: CDISC DEV-0
CONFIDENTIAL
Date: 30 September 2022
Version: 0.1
Status: Draft
Page: 4 of 73
Novo Nordisk
Table of contents
Page
Protocol amendment summary of changes table 3
Table of contents 4
1 Protocol summary 8
1.1 Synopsis 8
1.2 Flowchart 9
2 Introduction 13
2.1 Study rationale 13
2.2 Background 13
2.3 Benefit-risk assessment 13
2.3.1 Risk assessment 13
2.3.2 Benefit assessment 13
2.3.3 Overall benefit-risk conclusion 13
3 Objectives, endpoints and estimands 14
4 Study design 18
4.1 Overall design 18
4.2 Scientific rationale for study design 19
4.2.1 Patient input into design 19
4.3 Justification for dose 19
4.4 End of study definition 20
Select Study & Version
Template type: InterventionalStudyProtocol
Saved: CDISC DEV-0_D
Type Project number, Study ID, or Study acronym (min 3 characters):
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Page 4 of 73 58400 words English (United Kingdom) Accessibility: Investigate
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Structured content including SoA will be transferred to the content controls Word based Protocol Template

1.2 Flowchart

Schedule of Activities

Procedure	Screening	Treatment									Follow-up
Visit short name	**V1**	**V2**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9**	**V10**	**V11**
Study day	**-14**	**1**	**8**	**15**	**22**	**29**	**36**	**43**	**57**	**183**	**213**
Visit window (days)	**-13/+0**	**±0**	**±1**	**±1**	**±1**	**±1**	**±1**	**±1**	**±1**	**±1**	**+0/+35**
Randomisation											
Randomisation		X									
End of Study											
End of Study											X
Body Measurements											
Body Measurements	X	X	X	X	X	X	X	X	X	X	X
Eligibility Criteria											
Eligibility Criteria	X										
Laboratory Assessments											
Glucose Metabolism	X	X	X	X	X	X	X	X	X	X	
Lipids	X	X			X			X		X	
Biochemistry	X	X			X			X		X	
AE Requiring Additional Data											

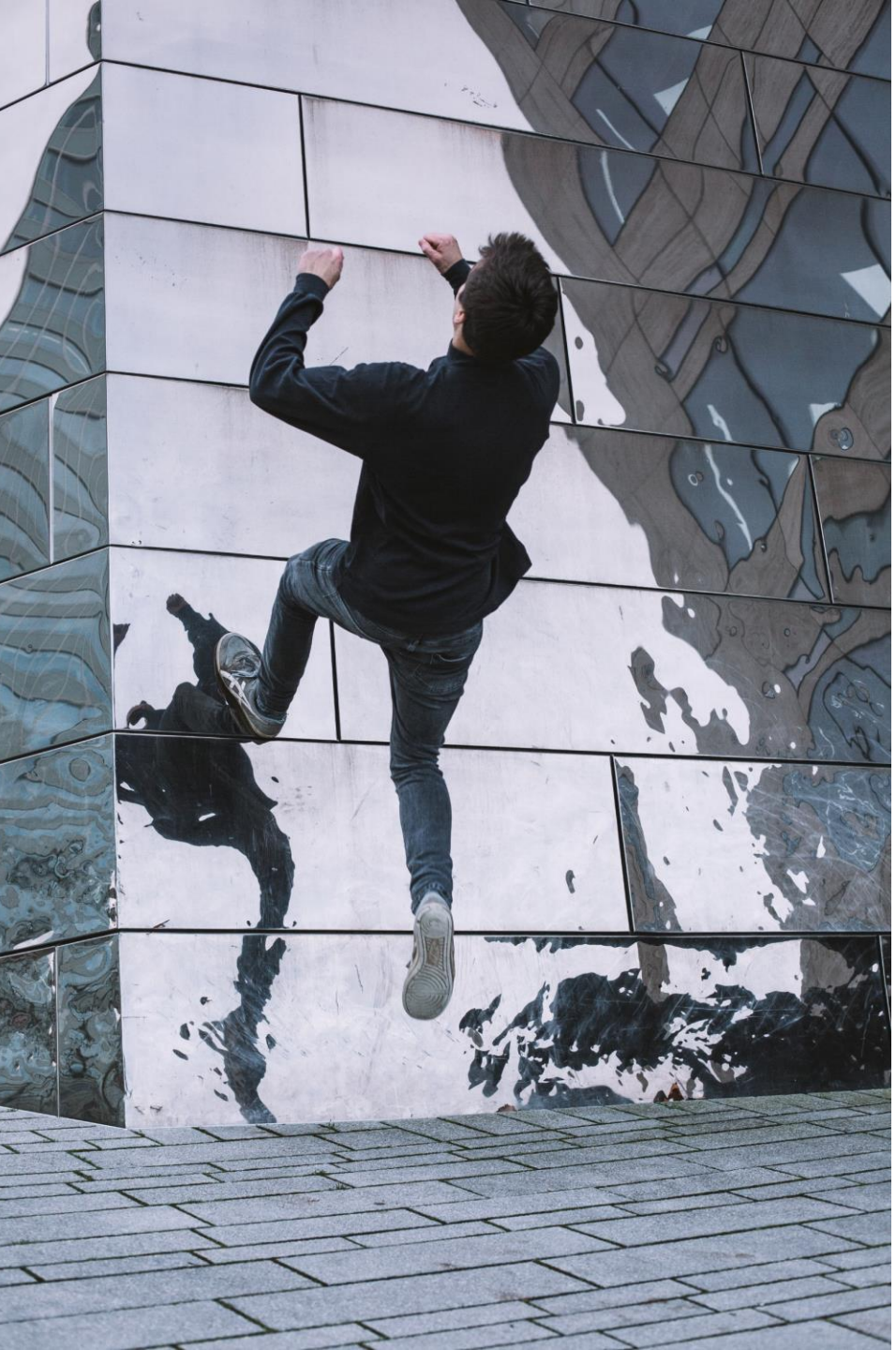
Get Data

Currently saved: CDISC DEV-(

Select all
- Protocol Title
- Protocol Short Title
- Universal Trial Number
- EudraCT Number
- IND Number
- Schedule of Activities
- Objectives & Endpoints
- Inclusion Criteria
- Exclusion Criteria

Update

Conclusion



OpenStudyBuilder next steps

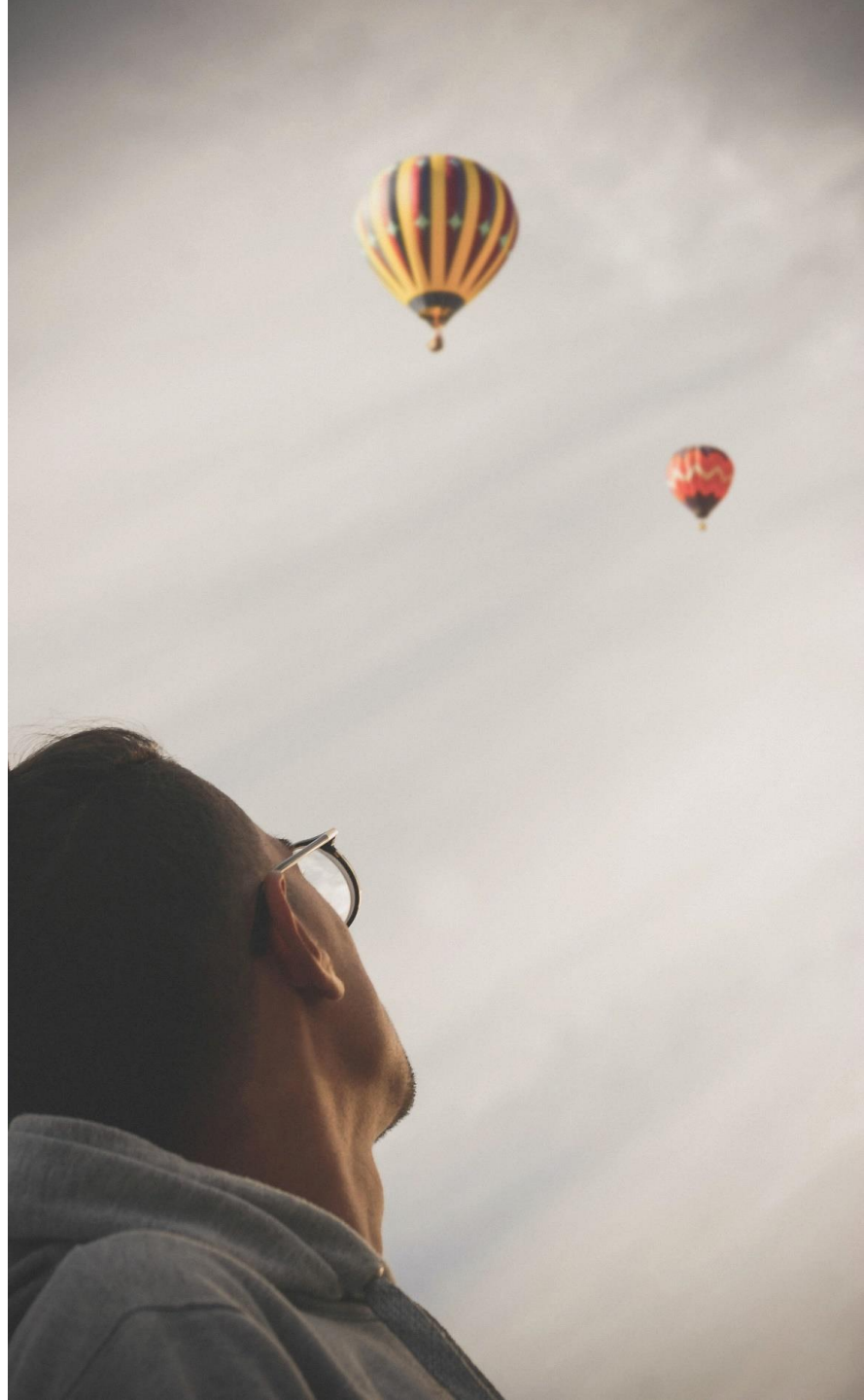
- Non-GCP MVP released internally at Novo Nordisk in September 2022 for pilots
- Business go-live November 2023 for phase 2-4 studies with protocol outline kickoff
- Share as open source project under COSA
  - https://cosa.cdisc.org/directory/openStudyBuilder
  - https://openstudybuilder.com/
- Word Addin planned to be released as open source

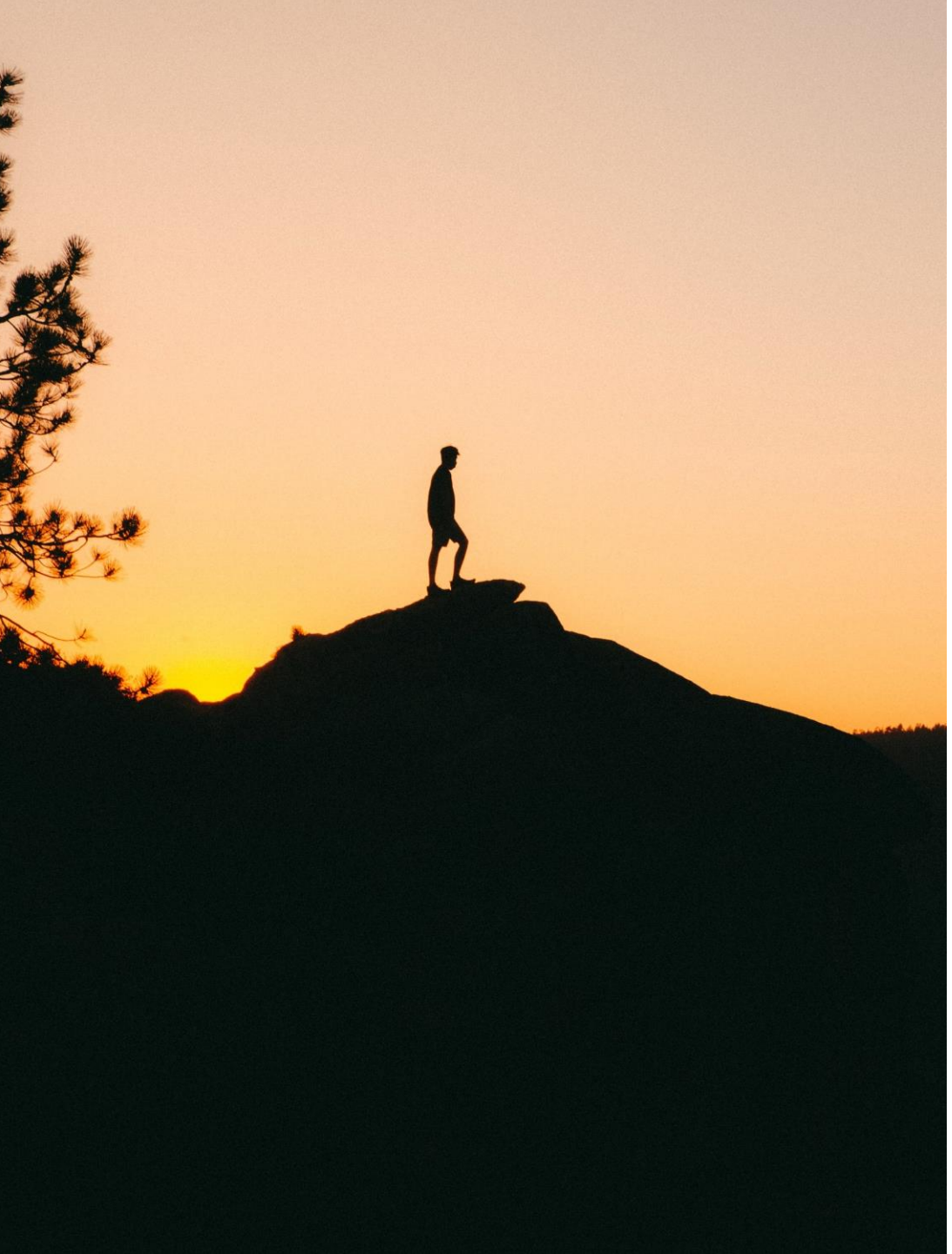
- Seek to actively collaborate with CDISC, TransCelerate DDF, peers and vendors

Links

- LinkedIn Newsletter
- Project Homepage: https://openstudybuilder.com/
  - Information
  - Guides
  - References
  - Events
- Demonstration Video (YouTube)
- GitLab Source Code
- Slack (invite Link)
- E-Mail: openstudybuilder@gmail.com

- Public Sandbox:
- Mail openstudybuilder@neotechnology.com – Subject “Request Sandbox access”
- Note: when add/modify/delete, you mail might be exposed in the version history





Getting along

- **Support**
  - Documentation
  - Newsletter (LinkedIn)
  - OpenStudyBuilder Q&A sessions (LinkedIn)
  - Slack & Mail
  - Commercial support options of vendors

- **Share**
  - Documentation, Feedback, Ideas
  - Enhancements, connected tools
  - Biomedical Concepts discussions & additions

Thanks!

Questions?