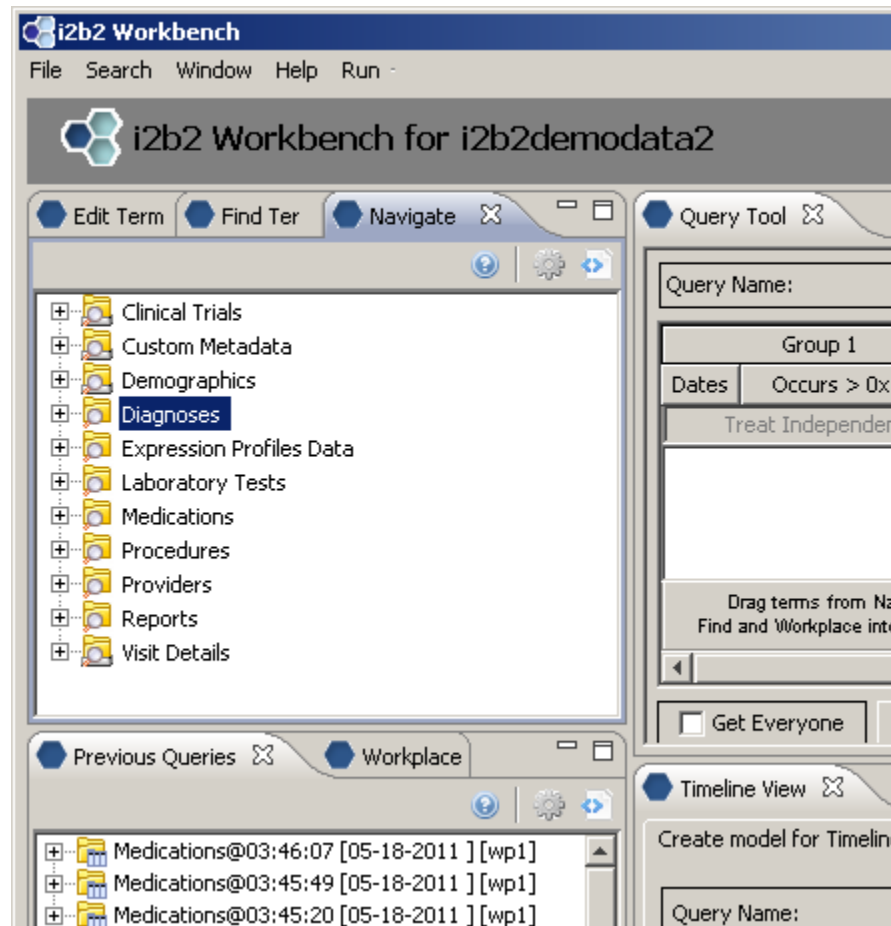# i2b2 Ontology Tutorial

Follow along for a step by step example of how metadata trees are created and configured.

i2b2 Navigate Terms View

Creating the root level nodes

There is a one-to-one mapping between the entries of the table_access table and the root level nodes for a given project.

	C_TABLE_CD	C_TABLE_NAME	C_HLEVEL	C_FULLNAME	C_NAME
1	BIRN	BIRN	0	\BIRN\	Clinical Trials
2	CUST	CUSTOM_META	0	\Custom Metadata\	Custom Metadata
3	i2b2_DEMO	I2B2	1	\i2b2\Demographics\	Demographics
4	i2b2_DIAG	I2B2	1	\i2b2\Diagnoses\	Diagnoses
5	i2b2_EXPR	I2B2	1	\i2b2\Expression Profiles Data\	Expression Profiles Data
6	i2b2_LABS	I2B2	1	\i2b2\Labtests\	Laboratory Tests
7	i2b2_MEDS	I2B2	1	\i2b2\Medications\	Medications
8	i2b2_PROC	I2B2	1	\i2b2\Procedures\	Procedures
9	i2b2_PROV	I2B2	1	\i2b2\Providers\	Providers
10	i2b2_REP	I2B2	1	\i2b2\Reports\	Reports
11	i2b2_VISIT	I2B2	1	\i2b2\Visit Details\	Visit Details

Building local metadata

```
<concept>
    <level>1</level>
    <key>\\i2b2_DIAG\i2b2\Diagnoses\</key>
 <name>Diagnoses</name>
    ...
</concept>
```

	C_TABLE_CD	C_TABLE_NAME	C_HLEVEL	C_FULLNAME	C_NAME
1	BIRN	BIRN	0	\BIRN\	Clinical Trials
2	CUST	CUSTOM_META	0	\Custom Metadata\	Custom Metadata
3	i2b2_DEMO	I2B2	1	\i2b2\Demographics\	Demographics
4	i2b2_DIAG	I2B2	1	\i2b2\Diagnoses\	Diagnoses
5	i2b2_EXPR	I2B2	1	\i2b2\Expression Profiles Data\	Expression Profiles Data
6	i2b2_LABS	I2B2	1	\i2b2\Labtests\	Laboratory Tests
7	i2b2_MEDS	I2B2	1	\i2b2\Medications\	Medications

A concept's key is made up of two parts: \\c_table_cd\c_fullname
The c_table_cd tells the ONT cell which metadata table the concept resides in ('i2b2'), while c_fullname is a unique identifier for the concept itself.

Children of concept Diagnoses [\i2b2\Diagnoses\]

C_HLEVEL	C_FULLNAME	C_NAME
2	\i2b2\Diagnoses\Circulatory system (390-459)\	Circulatory system
2	\i2b2\Diagnoses\Conditions in the perinatal period (760-779)\	Conditions in the perinatal period
2	\i2b2\Diagnoses\Congenital anomalies (740-759)\	Congenital anomalies
2	\i2b2\Diagnoses\Digestive system (520-579)\	Digestive system
2	\i2b2\Diagnoses\Endocrine disorders (240-259)\	Endocrine disorders
2	\i2b2\Diagnoses\Events of pregnancy (630-677)\	Events of pregnancy
2	\i2b2\Diagnoses\Genitourinary system (580-629)\	Genitourinary system
2	\i2b2\Diagnoses\Hematologic diseases (280-289)\	Hematologic diseases
2	\i2b2\Diagnoses\Infectious and parasitic diseases (001-139)\	Infectious and parasitic diseases
2	\i2b2\Diagnoses\Injury and poisoning (800-999)\	Injury and poisoning
2	\i2b2\Diagnoses\Mental Disorders (290-319)\	Mental Disorders
2	\i2b2\Diagnoses\Metabolic and immunity disorders (270-279)\	Metabolic and immunity disorders
2	\i2b2\Diagnoses\Musculoskeletal and connective tissue (710-739)\	Musculoskeletal and connective tissue
2	\i2b2\Diagnoses\Neoplasms (140-239)\	Neoplasms
2	\i2b2\Diagnoses\Neurologic Disorders (320-389)\	Neurologic Disorders
2	\i2b2\Diagnoses\Nutritional deficiences (260-269)\	Nutritional deficiences
2	\i2b2\Diagnoses\Respiratory system (460-519)\	Respiratory system
2	\i2b2\Diagnoses\Skin diseases (680-709)\	Skin diseases
2	\i2b2\Diagnoses\Symptoms, signs, and ill-defined conditions (780-799)\	Symptoms, signs, and ill-defined conditions
2	\i2b2\Diagnoses\zz E-codes\	E-codes
2	\i2b2\Diagnoses\zz V-codes\	V-codes

Concept Diagnoses' children all start with a c_fullname of '\i2b2\Diagnoses\'
        and all reside in the same table as 'Diagnoses' (c_table_cd = 'i2b2_DIAG', c_table_name = 'i2b2')

Children of concept Diagnoses display
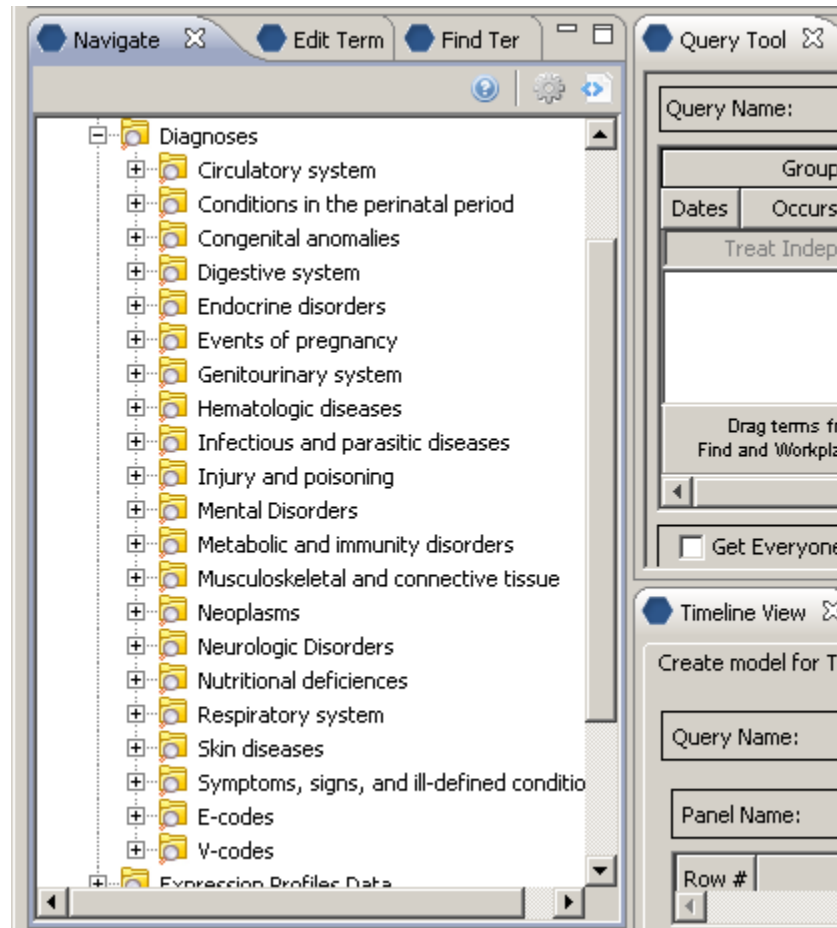
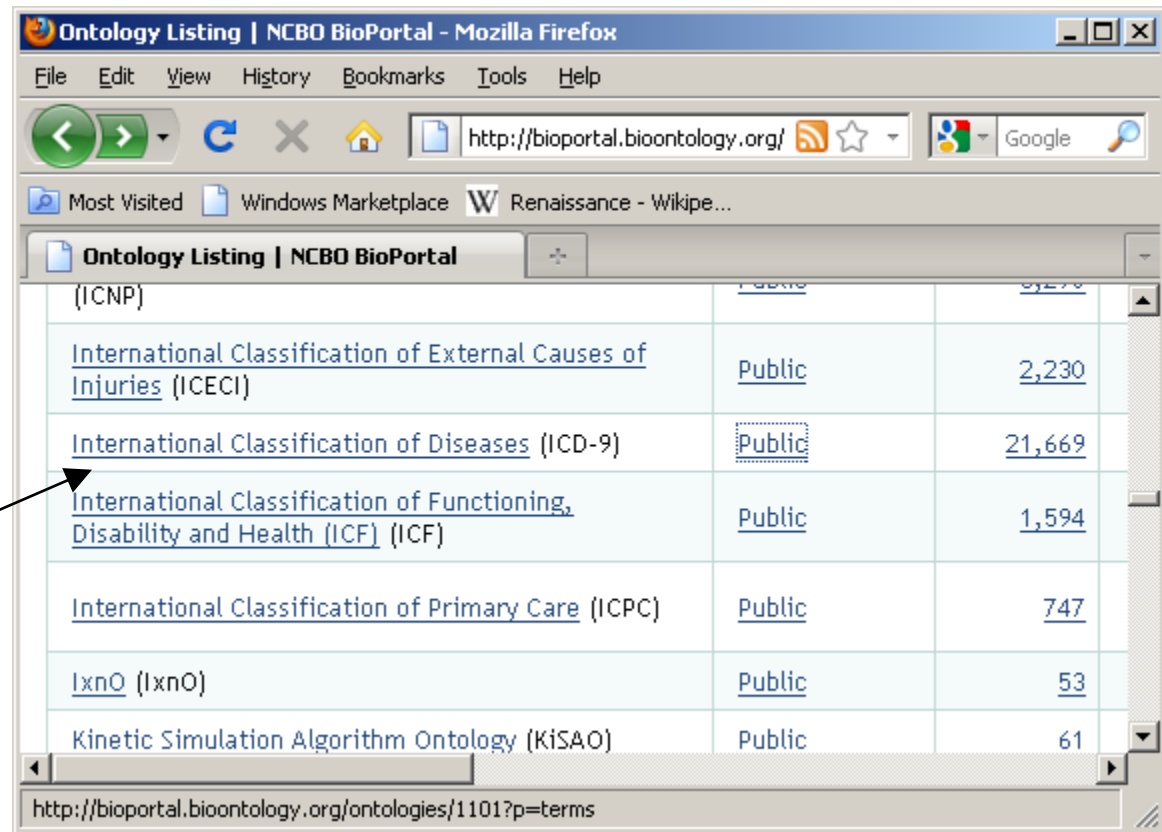# Creating metadata for standard ontologies using BioPortal
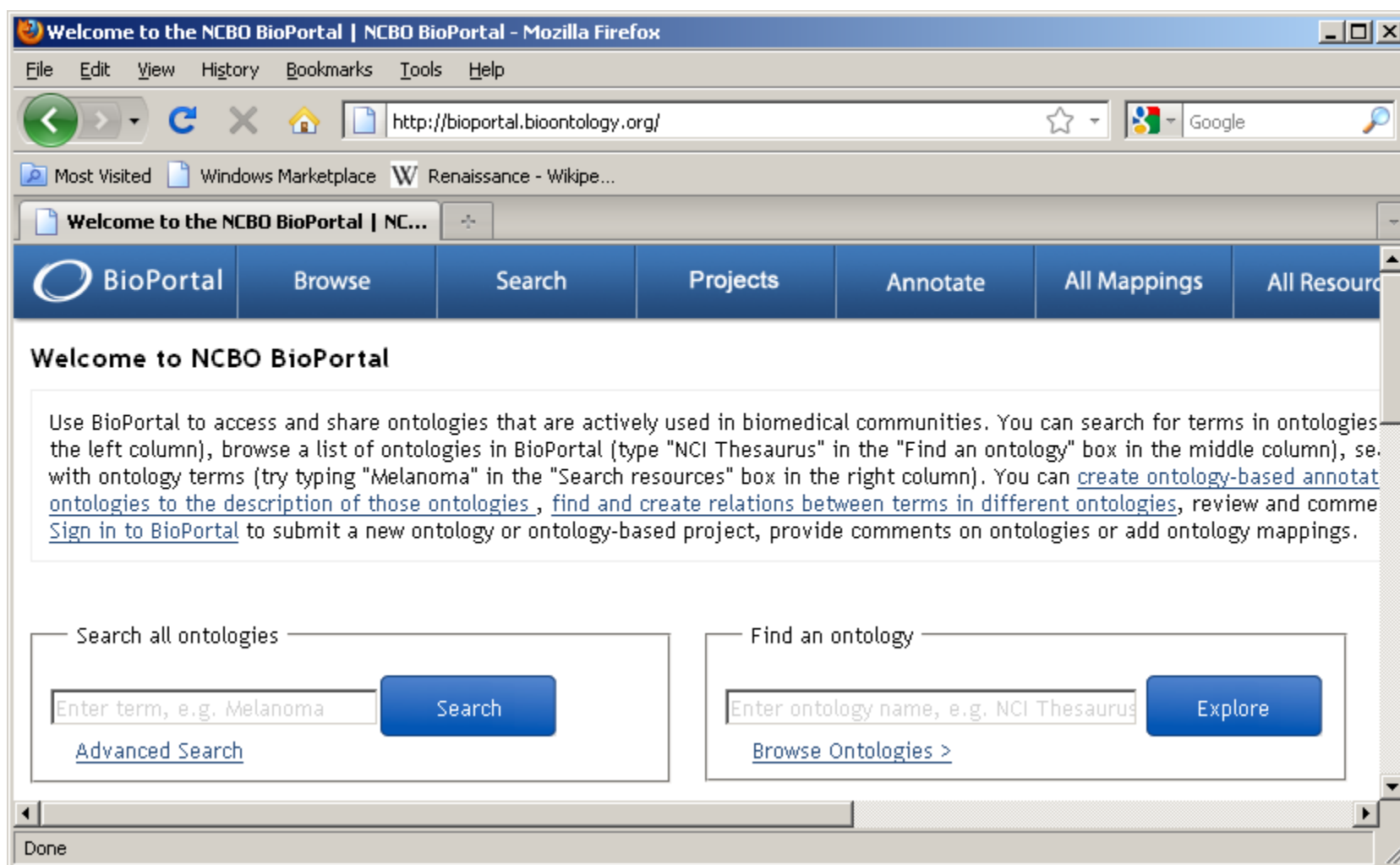
NCBO BioPortal hosts over 250 ontologies

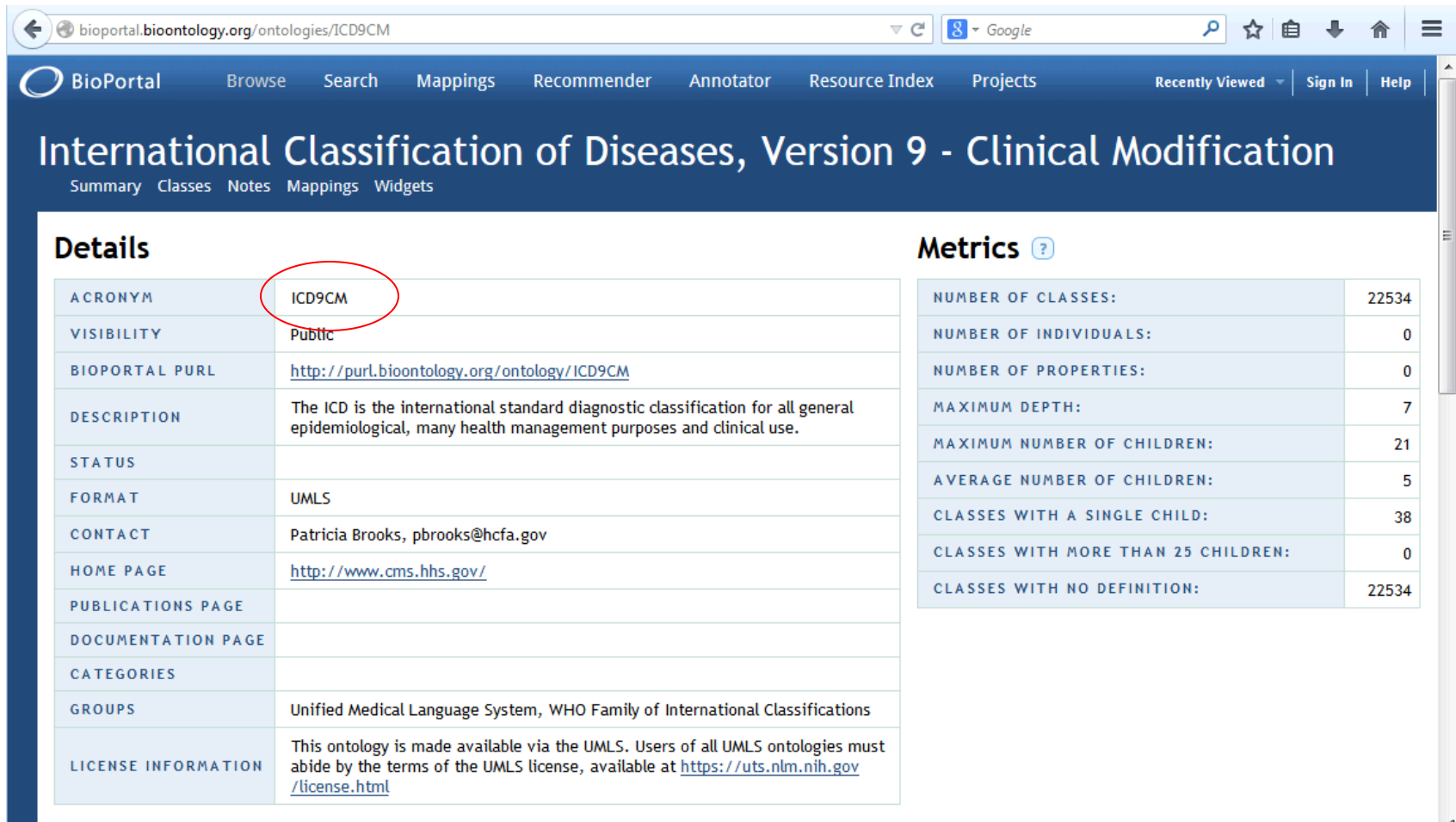Any of these ontologies may be extracted for use within i2b2 through use of a standalone Extraction tool. (https://community.i2b2.org/wiki/display/NCBO/NCBO+Ontology+Tools)

Browse ontologies within BioPortal and locate ontology of interest: (double click on name of ontology)

ICD-9

Details summary page: 'ICD9CM' is the ontology's acronym.

NCBO-specific Ontology Extraction tool inputs:

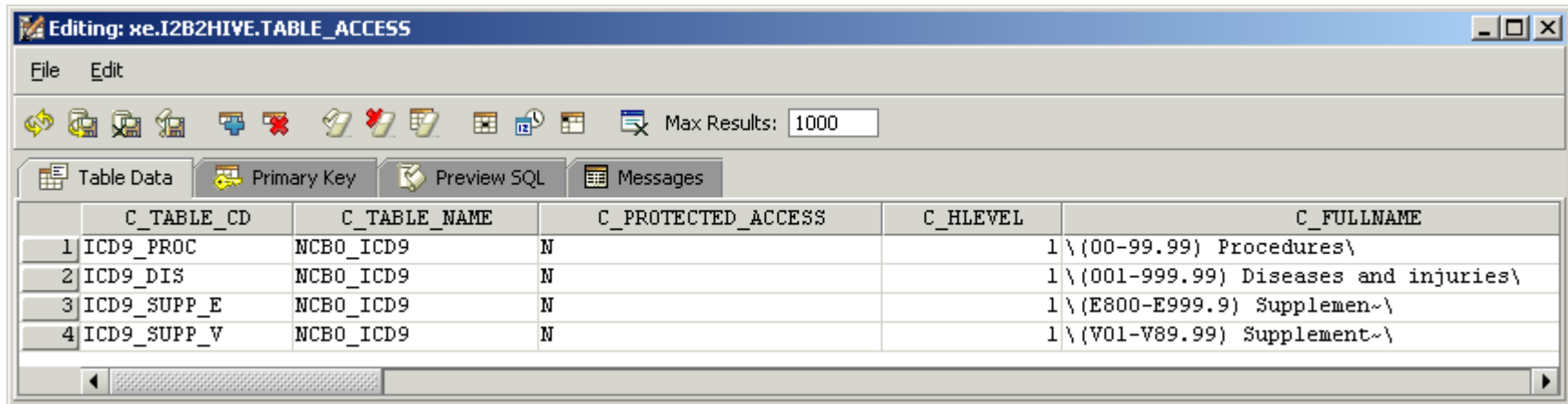**Ontology id: acronym of the ontology**

apikey: An API key assigned to you by NCBO. Log onto BioPortal (or get an account); your apikey is located on your Account page.

NCBO Ontology Extraction Workflow (2-stage process)

1. Extract data from NCBO to staging table

Request to extract ontology

Ontology id, apikey

Extraction Workflow

NCBO REST XML

2. Process data in staging table

Process

Extracted Data (Staging)

i2b2 Metadata (Final)
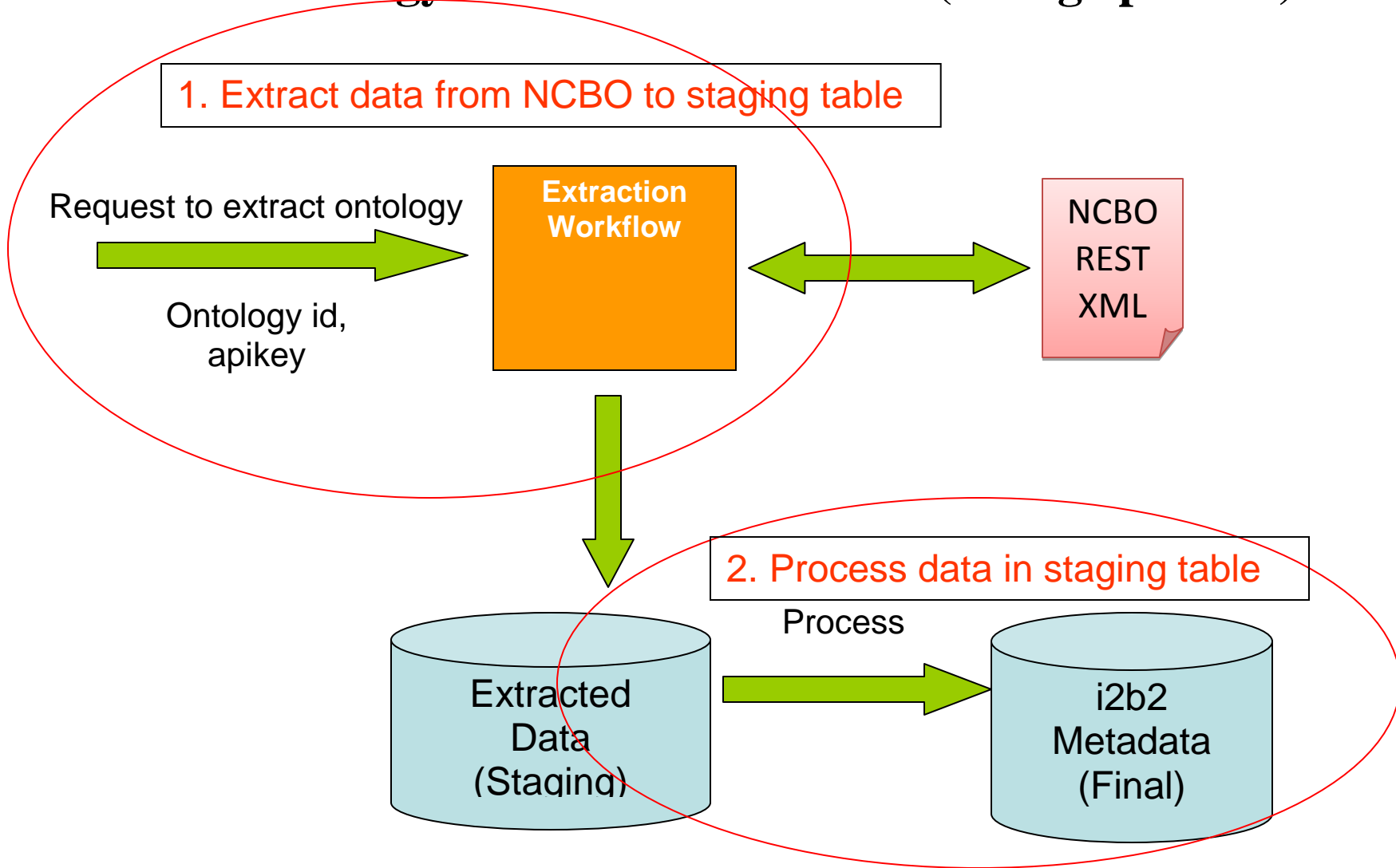
Point table_access to root nodes of your newly extracted metadata.

	C_TABLE_CD	C_TABLE_NAME	C_PROTECTED_ACCESS	C_HLEVEL	C_FULLNAME
1	ICD9_PROC	NCBO_ICD9	N	1	\(00-99.99) Procedures\
2	ICD9_DIS	NCBO_ICD9	N	1	\(001-999.99) Diseases and injuries\
3	ICD9_SUPP_E	NCBO_ICD9	N	1	\(E800-E999.9) Supplemen~\
4	ICD9_SUPP_V	NCBO_ICD9	N	1	\(V01-V89.99) Supplement~\