To create new type,

/ctakes/ctakes-dictionary-lookup-
fast/src/main/java/org/apache/ctakes/dictionary/lookup2/util/SemanticUtil.java

In SemanticUtil(), create a variable for the type and define the associated TUIs

Example in SemanticUtil.java

static private final String[] GENE = { "T028","T085","T086","T087","T088" }; //
TUIs related to that type

Create a new set, which uses a hash table, for the newly defined type

static private final Collection<String> GENE_TUIS = new HashSet<>(Arrays.asList(
GENE));

Associate the ctakes group id with their TUIs,

In getTuiSemanticGroupId(final String tui), add a case to the "if-else" block
    else if (GENE_TUIS.contains(tui)) { //**
      return CONST.NE_TYPE_ID_GENE;   // or just some integer, e.g. 11
    }

Add new cases in the switch block inside the term consumer so that it will identify
the annotated terms
/ctakes/ctakes-dictionary-lookup-
fast/src/main/java/org/apache/ctakes/dictionary/lookup2/consumer/DefaultTer
mConsumer.java

Example in DefaultTermConsumer.java

In IdentifiedAnnotation createSemanticAnnotation
case NE_TYPE_ID_GENE: {   //defined in CONST.java
        return new GeneMention(jcas);
     }

Constants are defined in
/ctakes/ctakes-type-
system/src/main/java/org/apache/ctakes/typesystem/type/constants/CONST.jav
a

Adding a new type,

/ctakes/ctakes-type-
system/src/main/resources/org/apache/ctakes/typesystem/types/TypeSystem.x
ml
Define the new type within the following

Example in TypeSystem.xml
```
<typeSystemDescription xmlns="http://uima.apache.org/resourceSpecifier">
 <types>
....
....
<typeDescription>
<name>org.apache.ctakes.typesystem.type.textsem.GeneMention</name>
<description>Corresponds to the UMLS Gene or Genome semantic
group</description>
<supertypeName>org.apache.ctakes.typesystem.type.textsem.EntityMention</supe
rtypeName>
<features>
<featureDescription>
<name>entity</name>
<description/>
<rangeTypeName>org.apache.ctakes.typesystem.type.refsem.Entity</rangeTypeNa
me>
</featureDescription>
</features>
</typeDescription>

....
....
 </types>
</typeSystemDescription>
```

Once all the changes are made, generate two new jar files from these directories
(below) to put in {binary-ctakes-directory}/lib/

/ctakes/ctakes-dictionary-lookup-fast/
/ctakes/ctakes-type-system/

Modify the pom files of their respective directories to use the new jar files

Changed the version name for common type system in /ctakes/ctakes-type-
system/pom.xml:

Example
```
    <name>Apache cTAKES common type system</name>
```

      <description>Defines the cTAKES type system UIMA annotation classes.</description>
     <version>3.2.3-SNAPSHOT-selina</version>

Changed dependency name for ctakes-type-system in /ctakes/ctakes-dictionary-lookup-fast/pom.xml:

Example
     <dependency>
       <groupId>org.apache.ctakes</groupId>
       <artifactId>ctakes-type-system</artifactId>
       <version>3.2.3-SNAPSHOT-selina</version>
     </dependency>

Generate two new jar files from these directories to put in binary-ctakes-directory/lib/

cd /ctakes/ctakes-dictionary-lookup-fast/
mvn package
cd target
cp ctakes-dictionary-lookup-fast-3.2.3-SNAPSHOT.jar {binary-ctakes-directory}/lib/.

/ctakes/ctakes-type-systemmvn package/
mvn package
cd target
cp ctakes-type-system-3.2.3-SNAPSHOT-selina.jar {binary-ctakes-directory}/lib/.