caBIG
Tissue Banks and Pathology Tools Workspace (TBPTWS)
Requirement Specifications Survey

I. Respondent Contact Information

Center:The Jackson Laboratory, Mouse Tumor Biology Database
Contact Name: Debbie Krupke
Contact e-mail: dmk@informatics.jax.org
Role (e.g. developer, adopter): Funded Member

II. Document Purpose

The purpose of this document is to collect information regarding the specifications of existing specimen bank data management systems and the perceived requirements of any new system that would be developed and adopted for the cancer Biomedical Informatics Grid (caBIG). In order to minimize the time and effort required to collect pertinent information, a series of guided responses are provided which should be answered as indicated. In the event that the options provided do not adequately characterize features of the data management system, the respondent is asked to provide brief details regarding the unique aspects of their system. **All information obtained from this survey will be kept confidential and will only be distributed in de-identified or aggregate form**. This information will be utilized by the caBIG TBPTWS development team to guide the construction of a data management system that can be easily deployed or adopted by all caBIG members. Prior to the onset of building this system, a formal "Requirements Specification" technical document will be produced and will be available for review and comment.

III. Scope of Specimen Bank

A. Please indicate the nature of the specimen bank served by your data management system (circle all that apply):
   1. ~~Limited specimen bank support for a single clinical trial~~
   2. ~~Specimen bank support for multiple clinical trials, same organ system~~
   3. ~~Specimen bank support for multiple clinical trials, multiple organ systems~~
   4. ~~General archival specimen bank (banked specimens not tied to specific trials)~~
   5. **Specimen registry (specimens tracked but not physically held)**
   6. ~~Specimen distribution (collection and distribution, but no banking)~~
   7. ~~Other (please describe below):~~

B. Please indicate the approximate number:

1. Number of independent protocols used for specimen collection: **Unknown**
2. Total number of participants registered: **Number of mice unknown.**
3. Total number of specimens banked: **~1,500 images held**
4. Annual specimen accrual: **several hundred images/year**
5. Annual number of specimens distributed: **N/A**

C. Please indicate the type of specimens collected: **Images collected from:**

1. Frozen Tissue Specimens
2. Paraffin Blocks from Surgical Pathology Service (Physically Held)
~~3. Paraffin Blocks form Surgical Pathology Service (Registry Only)~~
~~4. Lavage Specimens~~
~~5. Serum and/or Plasma~~
~~6. Urine~~
~~7. Peripheral blood cell pellet~~
~~8. Bone marrow aspirates~~
~~9. Extracted DNA~~
~~10. Extracted RNA~~
11. ~~Protein Lysates~~
12. Other (please describe below): slides, electronic image files

D. Where are specimens collected:

~~1. From a single site within the institution~~
~~2. From multiple sites within the institution~~
3. ~~From multiple institutions~~
4. From multiple sites within multiple institutions
~~5. Other (please describe below):~~

E. What are the specimen / participant relationships:

1. Single specimen collected from a single ~~participant~~ **mouse at one time**
2. Multiple specimens collected from a single ~~participant~~ **mouse at one time**
~~3. Multiple specimens collected from a single participant at multiple times~~
~~4. Multiple specimens collected from a single participant at multiple times in multiple studies~~
~~5. Other (please describe below):~~

F. Where are specimens stored:

~~1. In a single central location~~
~~2. In multiple, physically distinct locations within the institution~~
~~3. In multiple, physically distinct locations in different institutions~~
4. Specimens are registered but not stored in bank

G. Bank to Institution Relationships:

1. Does the bank collect tissue for only one medical/research institution
~~2. Does the bank collect tissue for multiple medical/research institutions (more than one IRB, etc)~~

H. What associated clinical data is collected with each specimen?
   1. **Donor Demographics: Strain, Genetic background, Germline mutations, Sex, Age (if available)**
   2. **Pathology Diagnosis and Findings**
   3. ~~Laboratory Data (Tumor Markers, etc) on Donor~~
   4. **Therapy History of Donor (if applicable)**
   5. ~~Outcomes (Recurrence, Progression)~~
   6. ~~Patient Clinical Trials Activity:~~ **N/A**
   7. **Other: Published Citation**

I. Are participants followed to update any of the clinical data below? **No**
   1. ~~Past or Future Pathology Reports~~
   2. ~~Laboratory Data (Tumor Markers, etc)~~
   3. ~~Therapy History of Donor~~
   4. ~~Clinical Status (Quality of Life)~~
   5. ~~Outcomes (Recurrence, Progression)~~
   6. ~~Vital Status~~
   7. ~~Most recent follow up date~~
   8. ~~Patient Clinical Trials Activity~~
   9. ~~Other~~

J. What is the immediate source of the clinical data collected?
   1. **Pathology Reports**
   2. ~~Laboratory Reports~~
   3. ~~Clinical Questionnaires~~
   4. ~~Outcomes/Oncology Registries~~
   5. ~~Medical Record~~
   6. ~~Clinical Trials Management Systems~~
   7. ~~Other~~

K. What Identifiers are stored with the specimen?
   1. ~~Tissue Bank "Accession" Number (Coded Number)~~
   2. ~~Surgical Pathology LIS Accession Number~~
   3. ~~Surgical Pathology LIS Accession Number and Block Letter~~
   4. ~~Social Security Number~~
   5. ~~Clinical Trial Participant ID Code~~
   6. ~~Hospital Patient ID~~
   7. ~~Other System ID (Describe):~~

IV. Inter-Bank Relationships

A. Please indicate data relationships between your specimen bank and other specimen banks with which you are aware.
   1. **This bank is a stand-alone operation and does not interact with any other banks**
   2. **This bank is stand-alone but could potentially interact with other relevant banks (e.g. similar organ site banks at other institutions or other organ site banks at the same institution)**

3. ~~This bank interacts (but no electronic data transfer) with other banks (How many?)~~
4. ~~This bank interacts using electronic data transfer with other banks (How many?)~~
5. ~~Other (please describe below):~~

B. If there is electronic data transfer between other banks, describe the nature of the data exchanged. **N/A**

1. ~~HIPAA De-identified Data~~
2. ~~Patient Identified Data~~
3. ~~Inventory Data~~
4. ~~Demographic Data~~
5. ~~Pathology Data~~
6. ~~Outcomes Data~~
7. ~~Other Data~~

C. If there are tissue samples exchanged between banks, describe the nature and circumstance of these transactions.

V. Current Database System and Tools

Please circle all statements that apply.

A. What is the current nature of your data system:

1. ~~We have no electronic data system (written log books only)~~
2. **Spreadsheet or other non-relational electronic system**
3. **Stand alone relational database (e.g. Access, 4D, Filemaker Pro)**
4. ~~Commercial product (Name:)~~
5. ~~Multi-tiered database server with dedicated client software~~
6. ~~Multi-tiered database web server~~
7. **Other (please describe below): Single-tiered database server & web server**

B. What modes of data entry do you currently utilize:

1. **Manual entry of data**
2. ~~Bar Coding~~
3. ~~Text scanning and encoding technology~~
4. ~~Manually merging of electronic data files~~
5. **Direct database to database interconnectivity (coming soon)**
6. ~~Other (please describe below):~~

C. What is the current disposition of your data system:

1. ~~Have no system~~
2. ~~Not satisfactory. Wish to replace it as soon as possible~~
3. ~~Adequate. Would replace it if something better was available~~
4. ~~Satisfactory. Might replace it only if a newer system was substantially better~~
5. ~~Established. Would not / could not consider replacing the system~~

6. **Other (please describe below): Currently moving from FileMaker Pro to Sybase**

D. How many Information Technology FTEs support the operation of your data system? **1**

E. How is metadata handled in the tissue bank:
   1. ~~There are no written data definitions~~
   2. ~~Data definitions, Date Entry and Validation Rules are written and available on paper~~
   3. ~~Data definitions, Data Entry and Validation Rules are written and available on line~~
   4. **Data definitions, Data Entry and Validation rules are incorporated in the tissue bank software**

VI. System Access

A. Please indicate methods in which users access your data system:
   1. ~~Directly from a workstation that hosts the database~~
   2. **Through dedicated client software and intranet communication**
   3. ~~Through web-based intranet communication (single institution)~~
   4. ~~Through web-based internet communication (multiple institutions)~~
   5. **Other (please describe): Web based internet communication**

B. Please indicate the types of users that access your system:
   1. **Clinical coordinators / Honest Brokers entering HIPAA-identified participant (Donor) data**
   2. **Bank personnel entering specimen tracking data**
   3. **Supervisors which edit data and insert new projects**
   4. **Administrators with read only / report access**
   5. **Research investigators querying for specimens**
   6. ~~Other (please describe):~~

C. Do different users have levels of read permissions in your system? **YES**

D. Do different users have levels of write (i.e data entry) permissions in your system? **YES**

E. Does your system track user access to the system?
   1. **Yes (coming soon)**
   2. ~~No~~

F. Does your system log transactions:
   1. **Logs data reads (coming soon)**
   2. **Logs data writes (coming soon)**
   3. **Logs data changes/edits (coming soon)**
   4. ~~There is no transaction logging~~
   5. ~~Other (Describe)~~

G. Please describe any other unique access features of your system below:

VII. IRB and Patient Confidentiality – Not Applicable

~~A. Under how many different IRB (Human Studies) protocols are specimens collected? If possible, please attach copies of these protocols and corresponding consent from language (as they pertain to specimen banking) as **Appendix C**.~~

~~B. Does your IRB make provisions for banking specimens for future, unspecified research?~~

~~C. Does your IRB make provision for aggregation and/or long-term clinical follow up of tissue donors (participants).~~

~~D. Are HIPAA-defined participant identifiers stored in your system?~~

~~E. Are specimens ever distributed with HIPAA-defined participant identifiers?~~

~~F. Are objects (i.e. participants or specimens) de-identified (coded) in your system? If so, explain the method of de-identification below:~~

~~G. Does your facility maintain an NCI-issued certificate of confidentiality?~~

~~H. Are research results stored in your system?~~

~~I. Please describe below the encryption / security measures utilized by your system to prevent access to participant identifiers:~~

~~J. How would you rate your working relationship with your IRB:~~

1. ~~**Poor.** Seldom communicate with the IRB; Many outstanding policy conflicts~~
2. ~~**Fair.** Seldom communicate with the IRB; No outstanding policy conflicts~~
3. ~~**Good.** Regular communication with the IRB; No policy conflicts~~
4. ~~**Excellent.** Proactively working with the IRB to shape policies~~

K. ~~As much as possible, please briefly describe scenarios where the specimen bank has had policy conflicts with the IRB or where matters of patient confidentiality have been problematic.~~

L. ~~Who is responsible for the appropriate research use of banked tissue?~~

VIII. Distribution, Sharing, Material Transfer, and Intellectual Property (IP)

A. Does the Bank work with Tissue Utilization Committees? (How many?) **NO**

B. ~~Who actually selects and approves the distribution of tissue to an investigator?~~

C. ~~How are specimens "prioritized" for distribution in the tissue bank?~~

D. ~~How does your tissue bank measure investigator feedback?~~

E. ~~How does the bank "market" itself and its tissue to investigators?~~

F. ~~Do you distribute specimens to extramural investigators who are named investigators on prospective collection studies?~~

G. ~~Do you distribute specimens to extramural investigators who are not part of the original collection protocol or who are requesting specimens from your general specimen bank archive?~~

H. ~~Do you have a standardized Materials Transfer Agreement for any specimen that is distributed extramurally? If so, please attach a copy of this agreement as **Appendix D**.~~

I. ~~Do you distribute specimens to commercial entities?~~

J. ~~How would you rate your working relationship with your Technology Transfer Office:~~

1. ~~**Poor.** Prohibited from distributing materials extramurally; Many outstanding policy conflicts~~

2. **Fair.** Policies for material/data transfer developed ad hoc on a case by case basis
3. **Good.** Standardized agreements available
4. **Excellent.** Proactive in working with Technology Office to streamline issues surrounding material transfer and IP specifically related to human specimens and associated data

K. As much as possible, please list key IP issues that have been raised at your institution with regard to sharing specimens and associated data with extramural institutions. **Permission to reproduce published images is sometimes difficult to get from the journal publishers.**

L. Does your institution have an official policy on the release of pre-publication and post-publication data? If so, please describe: **Pre-publication data is held private until the date of publication if requested by the submitter.**

IX. Data System Objects

For the purposes of this survey, 'Objects' are defined as physical entities about which data is collected and stored, usually in discrete data tables. Please indicate which objects are represented in your data system (note that the actual names of these objects may differ from system to system). In addition, please include your system's data schema as **Appendix A**.

A. *Studies* (Projects): A collection of participants and corresponding specimens that are collected under a uniform protocol and informed consent process
B. *Participants* (Donors): An individual from whom specimens are collected
C. *Sites* (Collection Sites): An institution or collection area within an institution where specimens are collected
D. *Collectors*: Clinical staff that collect specimens.
E. *Admissions* (Tissue Collection Event): An event in time that results in one or more collected specimens from a participant
F. *Specimens*: Biological material that is collected from a participant
G. *Segments*: Aliquot or subdivision of a single collected specimen
H. *Samples*: Molecular material (e.g. DNA or RNA) that is isolated from a specimen or segment
I. *Arrays*: An ordered collection of specimens, segments, or samples grouped as a single unit
J. *Investigators* (Research Projects): A researcher to whom a specimen, segment, sample, or array is distributed for laboratory investigation
K. *Distributions*: An event in time that results in one or more collected specimens, segments, samples, or arrays to be distributed to an investigator under a defined IRB protocol for a specific research project
L. *Users*: An individual who has access to the data system
M. *Other*: Use the format above to list other objects represented in your data system:

N. *Strains*: Defined strains (inbred, hybrid, or mutant strains) of mice or cohorts of mice.
O. *Strain Notes*: Details regarding the associated mice.
P. *Tumor*: A lesion identified in a mouse. These may be pre-neoplastic, benign, or malignant.
Q. *Gene*: The basic unit of heredity.
R. *Allele*: A variant form of a gene.
S. *Allele Pair*: Combinations of alleles (generally one from each copy of a chromsome.)
T. *Organ*: Organ, tissue, or cell type either of the origin of the lesion or affected by the lesion.
U. *Anatomical System*: Anatomical groups of organs and organ systems.
V. *Agent*: Substance or method utilized in the treatment of the mice.
W. *Incidence*: The frequency of a lesion in a strain under certain conditions.
X. *References*: A published citation or record of a personal communication.
Y. *Synonyms*: Alternate tumor designations.
Z. *Pathology*: Pathology reports
AA. *Image*: Data regarding electronic images
BB. *Probe*: Antibody or other agent used in histopathological analysis.
CC. *Tumor Notes*: Notes specific to a lesion.

X. System Data Elements

A. Please attach as **Appendix B**, a list of system data elements in the following format (This can be a dump of the table structures of a database):
Table NameData Element NameData TypeControlled Values? Description
See Appendix B

B. Please list any sources of common data elements or unified coding schemes employed by your system.
1. **Genes – Mouse Genome Informatics (MGI)**
2. **Alleles – MGI**
3. **Chromosomes - MGI**
4. **Organ – Coordinated with Mouse Adult Anatomy developed for the Gene Expression Database, part of MGI**

C. Does your system store other specialized data types (e.g. digital images)? Please specify and describe how they are used.
1. **Electronic images (in JPEG format) displayed via the internet. The files are held on the web server and are referenced via URL stored in the Image table in FMPro.**

XI. Use Cases

Below is a list of representative use cases that may be commonly employed by a specimen banking data system. Please see section IX for definitions of representative

objects. For each scenario, please indicate: 1=This functionality is not needed in the system; 2=This functionality is currently not employed in the system, but would be desirable; 3=This functionality is absolutely essential for the system.

A. Data Entry (all ranked "3")
    1. Enter a new reference
        a. Associate a reference with a strain
        b. Associate a reference with a tumor
    2. Enter a new strain
    3. Enter strain genetics
        a. Enter a new gene
        b. Enter a new allele
        c. Enter a new allele pair
        d. Associate an allele pair with a strain (linked to a reference)
    4. Enter strain notes (linked to a reference)
    5. Enter a new tumor
        a. Associate an organ with a tumor via the organ of origin relationship
        b. Associate an organ with a tumor via the organ affected relationship
        c. Add a new agent
        d. Associate an agent with a tumor
    6. Enter a new organ
    7. Enter a new synonym
        a. Associate a synonym with a tumor (linked to a reference)
    8. Enter a new incidence
    9. Enter pathology data
        a. Enter pathology report
        b. Enter image data
        c. Associate pathology report with tumor (linked to a reference)
        d. Associate image with pathology report
        e. Enter probe data
        f. Associate probe with image
    10. Enter tumor genetics
        a. Enter a new gene
        b. Enter a new allele
        c. Enter a new allele pair
        d. Associate an allele pair with a tumor (linked to a reference)
    11. Enter tumor notes (linked to a reference)
    12. Associate a tumor with another tumor via a parent/child relationship (i.e. metastases of a primary tumor)

B. Data Update/Delete (all ranked "3")
    1. Update/Delete reference data
        a. Dissociate a reference from a strain
        b. Dissociate a reference from a tumor
    2. Update/Delete strain data
    3. Update/Delete strain genetics
        a. Update/Delete gene data

   b. Update/Delete allele data
   c. Update/Delete allele pair data
   d. Dissociate allele pair from a strain
4. Update/Delete strain notes
5. Update/Delete tumor
   a. Update organ of origin for a tumor
   b. Update organ affected of a tumor
   c. Update/Delete an agent
   d. Dissociate an agent from a tumor
6. Update/Delete an organ
7. Update/Delete synonym
   a. Dissociate a synonym from a tumor
8. Update/Delete incidence
9. Update/Delete pathology data
   a. Update/Delete pathology report
   b. Update/Delete image data
   c. Dissociate a pathology report from a tumor
   d. Dissociate an image from a pathology report
   e. Update/Delete probe data
   f. Dissociate a probe from an image
10. Update/Delete tumor genetics
   a. Update/Delete gene data
   b. Update/Delete allele data
   c. Update/Delete allele pair data
   d. Dissociate allele pair from a tumor
11. Update/Delete tumor notes
12. Dissociate a tumor from another by removing a parent/child association

C. Data Querying (all ranked "3")
   1. Query for any data in any table

D. Other
   1. Associate mouse model pathology data with clinical pathology data for comparative pathology. (ranked "2")

XII. The caBIG Virtual Specimen Repository

One potential goal of the caBIG initiative is to create a virtual specimen repository where institutions could exchange specimen inventory data, actual biospecimens, and research data generated from such specimens.

A. Is your bank part of such a multi-institutional virtual tissue bank today? **NO**

B. Below, please indicate whether any of the following issues will impede the progress toward this goal at your institution (1=significantly prevent, 2=may prevent, 3=can be resolved, 4=will not impede):

1. IRB / Human Studies concerns about sharing specimen data (e.g. creating a web-accessible specimen catalog) **4**

2. IRB / Human Studies concerns about sharing specimens with other investigators for research studies not initially presented in the collection protocol / consent form **4**

3. IP concerns about sharing specimens with extramural institutions **4**

4. IP concerns about sharing research data generated from shared specimens **4**

5. Competing scientific interests for use of specimens **2**

6. Limited Information Systems support to create the required interfaces for inter-institutional data systems communication **2**

7. Perceived loss of control of specimens/data **2**

8. Please list below other specific restrictions that may limit the ability to share biospecimens and biospecimen data at your institution: **The OncoMouse patent is continually an impediment to any research involving genetically engineered mouse models for cancer.**

Appendix A. Please attach your system's data schema

Appendix B. Please attach a list of your system's data elements

~~**Appendix C**. Please attach language utilized by IRB protocols and consent form documents associated with specimen collection and banking~~

~~**Appendix D**. Please attach any standardized Materials Transfer Agreement utilized by your bank~~

~~**Appendix E**. Please attach examples of any administrative or client reports generated by your bank~~

XIII. FREE TEXT SECTION

A. Please provide a diagram identifying the main stakeholders in the tissue bank (IRB, Sponsoring Projects, Research Projects, Tissue Donors etc.) and their

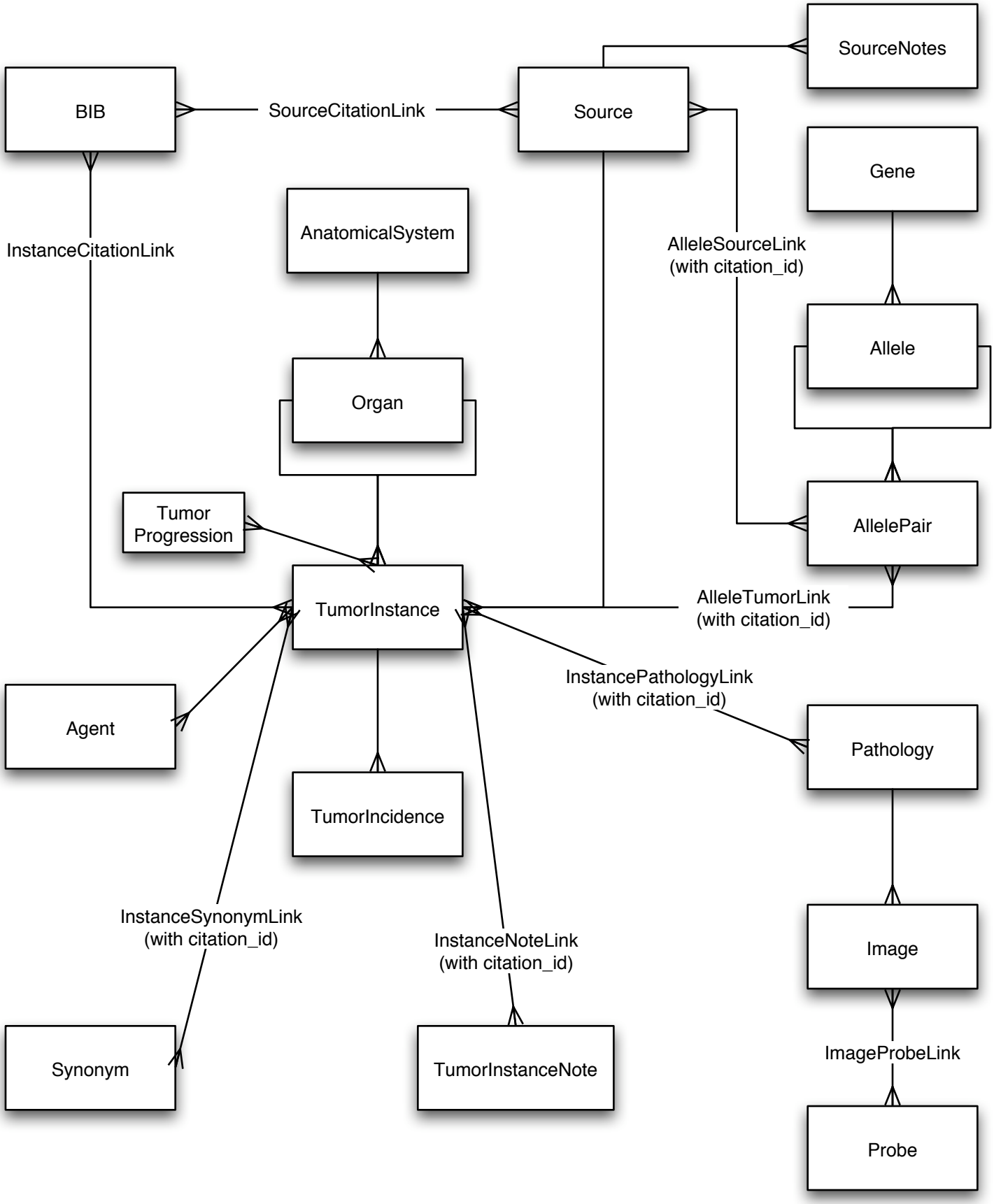
relationships between each other and the tissue bank. **Investigators (either internal to The Jackson Laboratory or external) donate tissues, slides, or images which are processed, annotated, reviewed, and then entered into the Mouse Tumor Biology Database.**

B. Please provide a free text description of how the following activities occur in the tissue bank:
    1. How is a typical Specimen Accessioned? **MTB doesn't hold specimens.**
    2. ~~How does an investigator request tissue from the bank and how does that request become a formal order and an actual distribution?~~
    3. ~~How does the bank Q/A its inventory?~~

XIV. **In my opinion, the one thing that caBIG could build that would most facilitate integration of the Mouse Tumor Biology Database with the clinical data from other cancer centers is a module to annotate and display comparative pathology data.**

Mouse Tumor Biology Database (MTB) FileMaker Pro schema

(soon to be replaced with a redesigned schema implemented in Sybase)



Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
citation_id	Number	Serial Number with Current Value: “1165” Increment: “1” Required value Unique values only Indexed
--- Entry fields journal ---	Global (Number)	
jnum	Text	Auto-enter: “J:” Required value Unique values only Indexed
authors	Text	Indexed
title	Text	Indexed
journal	Text	Indexed
vol	Text	Indexed
issue	Text	Indexed
year	Text	Only allow values in the range from “1926” to “2004” Message: “The value entered for the year of publication must be within the following range: 1926 to 2004.” Indexed
pgs	Text	Indexed
note	Text	Indexed
coded_by	Text	Indexed
checked_by	Text	Indexed
--- Entry fields personal ---	Global (Number)	
institution	Text	Indexed
department	Text	
street	Text	
city	Text	
state	Text	
country	Text	
zip	Text	
url	Text	
person_email	Text	
person	Text	Indexed
--- Entry fields misc. ---	Global (Number)	
coded_date	Date	Only allow values of type: “4-Digit Year Date” Indexed
checked_date	Date	Only allow values of type: “4-Digit Year Date” Indexed
priority	Text	Value List (Custom Values): Review Top High Medium Low Rejected Indexed
--- Calculation fields ---	Global (Text)	
first_author	Calculation (Text)	= Case(WordCount(authors) > 2, LeftWords(authors, 2) & ", et al.", WordCount(authors) = 2, LeftWords(authors, 2) & ".")
count_tumors	Calculation (Number)	Unstored calculation = Count(InstanceCitationLink::instance_id)
count_strains	Calculation (Number)	Unstored calculation = Count(SourceCitationLink::source_id)
--- Not Used ---	Global (Number)	
journal_duplicate_check	Calculation (Number)	Unstored calculation = Case(citation_id = JournalDuplicates::citation_id, 1,0)
MasterBibLinkURL	Calculation (Text)	= "http://prodwww.informatics.jax.org/usrlocalmgi/live/wi/www/searches/accession_report.cgi?id=" & jnum
journal_dup_check	Calculation (Number)	Unstored calculation = If(JournalDuplicates::citation_id = citation_id, 1, 0)
journal_count	Calculation (Number)	Unstored calculation = Count(JournalDuplicates::citation_id)

Field Name	Field Type	Formula / Entry Option
citation_id	Number	Required value Indexed
instance_id	Number	Required value Indexed
--- Entry fields ---	Global (Number)	
--- Lookup fields tumor ---	Global (Number)	
organ_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::organ_lkp” If no match: “Do not Copy” Indexed
subclass_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::tumor_subclass” If no match: “Do not Copy”
organ_aff_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::organ_aff_lkp” If no match: “Do not Copy”
tumor_mode_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::tumor_mode” If no match: “Do not Copy”
agent1_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent1_lkp” If no match: “Do not Copy”
agent2_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent2_lkp” If no match: “Do not Copy”
agent3_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent3_lkp” If no match: “Do not Copy”
strain_id_lkp	Number	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_origin_id” If no match: “Do not Copy” Indexed
strain_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_lkp” If no match: “Do not Copy” Indexed
strain_sex_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_sex_lkp” If no match: “Do not Copy”
strain_type_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_type_lkp” If no match: “Do not Copy”
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy” Indexed
authors_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::authors” If no match: “Do not Copy”
title_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::title” If no match: “Do not Copy”
journal_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::journal” If no match: “Do not Copy”
vol_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::vol” If no match: “Do not Copy”

Field Name	Field Type	Formula / Entry Option
issue_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::issue” If no match: “Do not Copy”
pgs_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::pgs” If no match: “Do not Copy”
year_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::year” If no match: “Do not Copy”
person_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::person” If no match: “Do not Copy”
institution_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::institution” If no match: “Do not Copy”
department_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::department” If no match: “Do not Copy”
street_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::street” If no match: “Do not Copy”
city_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::city” If no match: “Do not Copy”
state_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::state” If no match: “Do not Copy”
zip_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::zip” If no match: “Do not Copy”
country_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::country” If no match: “Do not Copy”
url_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::url” If no match: “Do not Copy”
person_email_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::person_email” If no match: “Do not Copy”
--- Lookup fields reference ---	Global (Number)	
first_author_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::first_author” If no match: “Do not Copy”
trash_can	Global (Container)	
--- Global fields ---	Global (Number)	
all_agents_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::all_agents” If no match: “Do not Copy”

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
source_citation_id	Number	Serial Number with Current Value: “1724752” Increment: “1” Do not allow user to override validation Required value Unique values only Only allow values of type: “Numeric Only” Indexed
--- Entry fields ---	Global (Number)	
citation_id	Number	Required value Indexed
source_id	Number	Required value Indexed
--- Lookup fields tumor ---	Global (Number)	
strain_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::strain_name” If no match: “Do not Copy” Indexed
strain_sex_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::sex” If no match: “Do not Copy”
strain_type_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::source_type” If no match: “Do not Copy”
--- Lookup fields reference ---	Global (Number)	
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy” Indexed
authors_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::authors” If no match: “Do not Copy”
title_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::title” If no match: “Do not Copy”
journal_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::journal” If no match: “Do not Copy”
vol_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::vol” If no match: “Do not Copy”
issue_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::issue” If no match: “Do not Copy”
pgs_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::pgs” If no match: “Do not Copy” Indexed
year_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::year” If no match: “Do not Copy” Indexed
person_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::person” If no match: “Do not Copy”
institution_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::institution” If no match: “Do not Copy”
department_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::department” If no match: “Do not Copy”

Field Name	Field Type	Formula / Entry Option
street_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::street” If no match: “Do not Copy”
city_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::city” If no match: “Do not Copy”
state_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::state” If no match: “Do not Copy”
zip_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::zip” If no match: “Do not Copy”
country_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::country” If no match: “Do not Copy”
url_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::url” If no match: “Do not Copy”
person_email_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::person_email” If no match: “Do not Copy”
first_author_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::first_author” If no match: “Do not Copy”
--- Global fields ---	Global (Number)	
trash_can	Global (Container)	
--- temp fields ---	Global (Number)	
citation_source_combo	Calculation (Text)	Indexed = citation_id & "," & source_id
citation_source_dup_check	Calculation (Number)	Unstored calculation = If(CitationSourceCombo::source_citation_id = source_citation_id, 1, 0)

Field Name	Field Type	Formula / Entry Option
source_id	Number	Serial Number with Current Value: “3630” Increment: “1” Required value Unique values only Indexed
strain_name	Text	Indexed
sex	Text	Value List (Custom Values): female male mixed population sex not specified Indexed
source_type	Text	Value List (Custom Values): chemically induced mutation chemically induced mutation & spontaneous mutation chemically induced mutation & targeted mutation (knockout) chimeric chimeric & targeted mutation (knockout) chimeric & targeted mutation (knockout) & transgenic chimeric & transgenic congenic congenic & chemically induced mutation congenic & chemically induced mutation & targeted mutation (knockout) congenic & spontaneous mutation congenic & targeted mutation (knockout) congenic & transgenic congenic & transgenic & chemically induced mutation congenic & transgenic & consomic congenic & transgenic & targeted mutation (conditional) congenic & transgenic & targeted mutation (knockout) consomic hybrid hybrid & chemically induced mutation hybrid & chemically induced mutation & targeted mutation (knockout) hybrid & congenic hybrid & fostered hybrid & radiation induced mutation hybrid & recombinant inbred hybrid & spontaneous mutation hybrid & targeted mutation (knockout) hybrid & transgenic inbred inbred & embryo transfer inbred & fostered non-inbred not specified other outbred outbred & spontaneous mutation outbred & transgenic partial consomic radiation induced mutation recombinant congenic recombinant congenic & hybrid recombinant congenic & targeted mutation (knockout) recombinant inbred recombinant inbred & embryo transfer Robertsonian translocation Robertsonian translocation & chemically induced mutation spontaneous mutation spontaneous mutation & fostered spontaneous mutation & targeted mutation (knockout) targeted mutation (knockout) targeted mutation (knockout) & targeted mutation (knock-in) targeted mutation (knockout) & transgenic targeted mutation (knock-in) targeted mutation (conditional) targeted mutation (gene trap) targeted mutation (conditional) & targeted mutation (knock-in) targeted mutation (conditional) & targeted mutation (knockout) targeted mutation (conditional) & targeted mutation (knockout) & targeted mutation (knock-in) transgenic transgenic & chemically induced mutation transgenic & consomic transgenic & spontaneous mutation transgenic & targeted mutation (conditional) transgenic & targeted mutation (conditional) & targeted mutation (knockout) transgenic & targeted mutation (knockout) translocation Indexed
family	Text	Validation calculation = source_type = "inbred" or source_type = "spontaneous mutation" or source_type = "fostered" Message: “This field is designed for use in records for inbred strains, fostered strains and strains carrying spontaneous mutations. Allow this entry anyhow?” Indexed

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
source_note_id	Number	Serial Number with Current Value: “2578” Increment: “1” Required value Unique values only Indexed
--- Entry fields ---	Global (Number)	
source_id	Number	Required value Indexed
citation_id	Number	Required value Indexed
notes	Text	Required value Indexed
--- Lookup fields ---	Global (Number)	
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy”
--- Global fields ---	Global (Number)	
trash_can	Global (Container)	
--- Temp fields ---	Global (Number)	

Field Name	Field Type	Formula / Entry Option
--- Used for Calculation fields ---	Global (Number)	
allele_source_link_id	Number	Serial Number with Current Value: “2960” Increment: “1” Required value Unique values only
--- Entry fields ---	Global (Number)	
source_id	Number	Required value Indexed
allelepair_id	Number	Required value Indexed
citation_id	Text	Indexed
--- Lookup fields strain ---	Global (Number)	
strain_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::strain_name” If no match: “Do not Copy” Indexed
strain_sex_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::sex” If no match: “Do not Copy”
strain_type_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::source_type” If no match: “Do not Copy”
strain_family_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::family” If no match: “Do not Copy”
strain_jaxnum_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::jax_stock_num” If no match: “Do not Copy”
strain_note_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::note” If no match: “Do not Copy”
strain_allnames_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::all_names” If no match: “Do not Copy”
strain_lothar_lkp	Text	Lookup: Use relationship “Source” “source_id” = “Source::source_id” If exact match, copy “Source::Lothar_link” If no match: “Do not Copy”
--- Lookup fields allele ---	Global (Number)	
gene_symb_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_symb_lkp” If no match: “Do not Copy” Indexed
gene_name_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_name_lkp” If no match: “Do not Copy” Indexed
gene_chrom_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_chrom_lkp” If no match: “Do not Copy”
gene_species_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_species_lkp” If no match: “Do not Copy” Indexed
gene_acc_num_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_acc_num_lkp” If no match: “Do not Copy” Indexed
allele1_id_lkp	Number	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_id” If no match: “Do not Copy”

Field Name	Field Type	Formula / Entry Option
allele1_muttype_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_muttype_lkp” If no match: “Do not Copy” Indexed
allele1_symb_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_symb_lkp” If no match: “Do not Copy” Indexed
allele1_name_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_name_lkp” If no match: “Do not Copy”
allele1_notes_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_notes_lkp” If no match: “Do not Copy” Indexed
allele2_id_lkp	Number	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_id” If no match: “Do not Copy”
allele2_muttype_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_muttype_lkp” If no match: “Do not Copy” Indexed
allele2_symb_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_symb_lkp” If no match: “Do not Copy” Indexed
allele2_name_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_name_lkp” If no match: “Do not Copy”
allele2_notes_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_notes_lkp” If no match: “Do not Copy” Indexed
both_alleles_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::both_alleles” If no match: “Do not Copy”
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy” Repeating field with 999 repetitions Indexed
--- Calculation fields ---	Global (Number)	
unique	Calculation (Text)	Indexed = source_id & "," & allelepair_id
unique_dup_check	Calculation (Number)	Unstored calculation = If(Unique::allele_source_link_id = allele_source_link_id, 1, 0)
allele1_acc_num_lkp	Calculation (Text)	Unstored calculation = AllelePair::allele1_acc_num_lkp
allele2_acc_num_lkp	Calculation (Text)	Unstored calculation = AllelePair::allele2_acc_num_lkp
--- Global fields ---	Global (Number)	
trash_can	Global (Container)	
--- Temp fields ---	Global (Number)	
temp_global	Global (Number)	

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
allelepair_id	Number	Serial Number with Current Value: “1870” Increment: “1” Required value Unique values only Indexed
--- Entry fields ---	Global (Number)	
allele1_id	Number	Indexed
allele2_id	Number	Indexed
--- Lookup fields ---	Global (Number)	
marker_id	Number	Lookup: Use relationship “Allele1” “allele1_id” = “Allele1::allele_id” If exact match, copy “Allele1::marker_id” If no match: “Do not Copy” Indexed
gene_symb_lkp	Text	Lookup: Use relationship “Gene” “marker_id” = “Gene::marker_id” If exact match, copy “Gene::symbol” If no match: “Do not Copy” Indexed
gene_acc_num_lkp	Text	Lookup: Use relationship “Gene” “marker_id” = “Gene::marker_id” If exact match, copy “Gene::other_acc_num” If no match: “Do not Copy” Indexed
gene_name_lkp	Text	Lookup: Use relationship “Gene” “marker_id” = “Gene::marker_id” If exact match, copy “Gene::name” If no match: “Do not Copy” Indexed
gene_species_lkp	Text	Lookup: Use relationship “Gene” “marker_id” = “Gene::marker_id” If exact match, copy “Gene::species” If no match: “Do not Copy” Indexed
gene_chrom_lkp	Text	Lookup: Use relationship “Gene” “marker_id” = “Gene::marker_id” If exact match, copy “Gene::chromosome” If no match: “Do not Copy” Indexed
allele1_acc_num_lkp	Text	Lookup: Use relationship “Allele1” “allele1_id” = “Allele1::allele_id” If exact match, copy “Allele1::allele_accession_number” If no match: “Do not Copy” Indexed
allele1_symb_lkp	Text	Lookup: Use relationship “Allele1” “allele1_id” = “Allele1::allele_id” If exact match, copy “Allele1::allele_symbol” If no match: “Do not Copy” Indexed
allele1_muttype_lkp	Text	Lookup: Use relationship “Allele1” “allele1_id” = “Allele1::allele_id” If exact match, copy “Allele1::mutation_type” If no match: “Do not Copy” Indexed
allele1_name_lkp	Text	Lookup: Use relationship “Allele1” “allele1_id” = “Allele1::allele_id” If exact match, copy “Allele1::allele_name” If no match: “Do not Copy” Indexed
allele1_notes_lkp	Text	Lookup: Use relationship “Allele1” “allele1_id” = “Allele1::allele_id” If exact match, copy “Allele1::allele_note” If no match: “Do not Copy” Indexed
allele2_acc_num_lkp	Text	Lookup: Use relationship “Allele2” “allele2_id” = “Allele2::allele_id” If exact match, copy “Allele2::allele_accession_number” If no match: “Do not Copy” Indexed
allele2_symb_lkp	Text	Lookup: Use relationship “Allele2” “allele2_id” = “Allele2::allele_id” If exact match, copy “Allele2::allele_symbol” If no match: “Do not Copy” Indexed

Field Name	Field Type	Formula / Entry Option
allele2_muttype_lkp	Text	Lookup: Use relationship “Allele2” “allele2_id” = “Allele2::allele_id” If exact match, copy “Allele2::mutation_type” If no match: “Do not Copy” Indexed
allele2_name_lkp	Text	Lookup: Use relationship “Allele2” “allele2_id” = “Allele2::allele_id” If exact match, copy “Allele2::allele_name” If no match: “Do not Copy” Indexed
allele2_notes_lkp	Text	Lookup: Use relationship “Allele2” “allele2_id” = “Allele2::allele_id” If exact match, copy “Allele2::allele_note” If no match: “Do not Copy”
--- Calculation fields ---	Global (Number)	
both_alleles	Calculation (Text)	Indexed = allele1_id & "¶" & allele2_id
both_muttypes	Calculation (Text)	Indexed = allele1_muttype_lkp & "¶" & allele2_muttype_lkp
gene_mut_calc	Calculation (Text)	Indexed = marker_id & ", " & allele1_muttype_lkp & "¶" & marker_id & ", " & allele2_muttype_lkp
gene_id_muttype2	Calculation (Text)	Indexed = marker_id & ", " & allele2_muttype_lkp
count_tumors	Calculation (Number)	Unstored calculation = Count(AlleleTumorLink::instance_id)
count_strains	Calculation (Number)	Unstored calculation = Count(AlleleSourceLink::source_id)
count_related	Calculation (Number)	Unstored calculation = Count(AlleleTumorLink::instance_id) + Count(AlleleSourceLink::source_id)
same_gene_check	Calculation (Text)	Unstored calculation = If(Allele1::marker_id > 0 and Allele2::marker_id > 0 and Allele1::marker_id ≠ Allele2::marker_id, "WARNING: These two alleles are from two different genes.", "")
--- Not Used ---	Global (Number)	
--- New fields ---	Global (Number)	

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
allele_id	Number	Serial Number with Current Value: “1925” Increment: “1” Required value Unique values only Indexed
--- Entry fields ---	Global (Number)	
marker_id	Number	Indexed
mutation_type	Text	Value List (Custom Values): Normal Aberrant splicing Amplification Antisense CGH - Gain CGH - Loss CGH - No changes detected Chemically induced mutation Chromatid fragmentation Chromosomal fragmentation Deletion Deletion & point mutation Deletion of a whole copy of a chromosome Derivative chromosome Derivative chromosome & translocation Dicentric chromosome Double minute chromosomes Double point mutations Extralong chromosome Gain of a whole copy of a chromosome Gain of a whole copy of a chromosome & translocation Gain of a whole copy of a partially deleted chromosome Gain of a whole copy of a Robertsonian translocation Gene fragment Genomic instability Genomic instab. not detected Insertion Isochromosome Isogene (congenic) Loss of heterozygosity Monosomy Mutation type not specified Nonsense mutation Ploidy - Aneuploid Ploidy - Diploid Ploidy - Pseudodiploid Ploidy - Subtetraploid Ploidy - Tetraploid Ploidy - Triploid Point mutation Promoter methylation Quadriradials Quantitative trait locus (QTL) Radiation induced mutation Robertsonian translocation Somatic mutation Spontaneous mutation Tandem repeat Targeted mutation (conditional) Targeted mutation (gene trap) Targeted mutation (hypomorphic allele) Targeted mutation (knockout) Targeted mutation (knock-in) Transgene Transgene & fusion protein Transgene & Point mutation Transgene & truncation mutant Translocation Triradials Trisomy Truncation mutation Unspecified mutation Indexed
allele_symbol	Text	Indexed
allele_name	Text	Indexed
allele_accession_number	Text	Unique values only Indexed
allele_note	Text	Indexed

Field Name	Field Type	Formula / Entry Option
marker_id	Number	Serial Number with Current Value: “453” Increment: “1” Required value Unique values only Indexed
other_acc_num	Text	Indexed
species	Text	Value List (Custom Values): mouse human rat hamster cattle quail bacterial viral monkey, African green firefly not specified Required value Indexed
chromosome	Text	Value List (Custom Values): 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 X Y unknown Indexed
symbol	Text	Indexed
name	Text	Indexed
Marker_URL	Calculation (Text)	= Case(species = "mouse", "http://www.informatics.jax.org/searches/accession_report.cgi?id=" & other_acc_num, species = "human", "http://www.informatics.jax.org/searches/accession_report.cgi?id=" & other_acc_num)

Field Name	Field Type	Formula / Entry Option
--- Used for Calculations ---	Global (Number)	
allele_tumor_link_id	Number	Serial Number with Current Value: “2630” Increment: “1” Required value Unique values only Indexed
--- Entry fields ---	Global (Number)	
instance_id	Number	Required value Indexed
allelepair_id	Number	Required value Indexed
citation_id	Text	Required value Indexed
--- Lookup fields ---	Global (Number)	
strain_origin_id	Number	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_origin_id” If no match: “Do not Copy” Indexed
marker_id	Number	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::marker_id” If no match: “Do not Copy” Indexed
allele1_id	Number	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_id” If no match: “Do not Copy” Indexed
organ_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::organ_lkp” If no match: “Do not Copy” Indexed
subclass_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::tumor_subclass” If no match: “Do not Copy”
organ_aff_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::organ_aff_lkp” If no match: “Do not Copy”
tumor_mode_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::tumor_mode” If no match: “Do not Copy” Indexed
agent1_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent1_lkp” If no match: “Do not Copy”
agent2_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent2_lkp” If no match: “Do not Copy”
agent3_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent3_lkp” If no match: “Do not Copy”
all_agents	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::all_agents” If no match: “Do not Copy”
strain_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_lkp” If no match: “Do not Copy”
strain_sex_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_sex_lkp” If no match: “Do not Copy”
strain_type_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_type_lkp” If no match: “Do not Copy”

Field Name	Field Type	Formula / Entry Option
gene_symb_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_symb_lkp” If no match: “Do not Copy” Indexed
gene_name_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_name_lkp” If no match: “Do not Copy”
gene_chrom_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_chrom_lkp” If no match: “Do not Copy”
gene_acc_num_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_acc_num_lkp” If no match: “Do not Copy” Indexed
gene_species_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::gene_species_lkp” If no match: “Do not Copy” Indexed
allele1_id_lkp	Number	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_id” If no match: “Do not Copy”
allele1_muttype_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_muttype_lkp” If no match: “Do not Copy” Indexed
allele1_symb_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_symb_lkp” If no match: “Do not Copy”
allele1_name_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_name_lkp” If no match: “Do not Copy”
allele1_notes_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele1_notes_lkp” If no match: “Do not Copy”
allele2_id_lkp	Number	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_id” If no match: “Do not Copy” Indexed
allele2_muttype_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_muttype_lkp” If no match: “Do not Copy” Indexed
allele2_symb_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_symb_lkp” If no match: “Do not Copy”
allele2_name_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_name_lkp” If no match: “Do not Copy”
allele2_notes_lkp	Text	Lookup: Use relationship “AllelePair” “allelepair_id” = “AllelePair::allelepair_id” If exact match, copy “AllelePair::allele2_notes_lkp” If no match: “Do not Copy”
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy” Indexed
--- Calculation fields ---	Global (Number)	
unique	Calculation (Text)	Indexed = instance_id & "," & allelepair_id

Field Name	Field Type	Formula / Entry Option
unique_dup_check	Calculation (Number)	Unstored calculation = If(Unique::allele_tumor_link_id=allele_tumor_link_id, 1, 0)
allele_calc	Calculation (Text)	Indexed = marker_id & "," & allele1_id
allele_calc_dup_check	Calculation (Number)	Unstored calculation = If(AlleleCalc::allele_tumor_link_id=allele_tumor_link_id, 1, 0)
allele_calc_count	Calculation (Number)	Unstored calculation = Count(AlleleCalc::allele_tumor_link_id)
both_muttypes	Calculation (Text)	Indexed = allele1_muttype_lkp & "¶" & allele2_muttype_lkp
--- Global fields ---	Global (Container)	
trash_can	Global (Container)	

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
instance_id	Number	Serial Number with Current Value: “16419” Increment: “1” Required value Unique values only Indexed
--- Entry fields ---	Global (Number)	
organ_id	Number	Indexed
tumor_subclass	Text	Value List (Custom Values): acanthoma adenoacanthoma adenoacanthoma - ciliated areas adenoacanthoma - molluscoid type adenoacanthoma - mucinous glandular areas adenoacanthoma - non-ciliated areas adenoacanthoma - pale cell type adenocarcinoma adenocarcinoma - acinar adenocarcinoma - anaplastic adenocarcinoma - ciliated adenocarcinoma - differentiated adenocarcinoma - endophytic adenocarcinoma - exophytic adenocarcinoma - exophytic/endophytic adenocarcinoma - fibroid adenocarcinoma - intraductal adenocarcinoma - large cystic adenocarcinoma - mixed adenocarcinoma - mucinous adenocarcinoma - non-ciliated adenocarcinoma - papillary adenocarcinoma - papillary/cystic adenocarcinoma - small acinar adenocarcinoma - solid adenocarcinoma - tubulostromal adenocarcinoma - type A adenocarcinoma - type B adenocarcinoma - type C adenocarcinoma - type L adenocarcinoma - type Y adenocarcinoma - undifferentiated adenocarcinoma - well-differentiated adenoma adenoma - acidophilic adenoma - acinar adenoma - atypical adenoma - basophilic adenoma - clear cell adenoma - cystic adenoma - cystic papillary adenoma - fibroid adenoma - follicular adenoma - macroadenoma adenoma - mammotropic adenoma - microadenoma adenoma - microfollicular adenoma - mixed adenoma - mixed solid-papillary adenoma - papillary adenoma - prolactin-producing adenoma - sebaceous adenoma - solid adenoma - thyrotropic adenoma - tubular adenoma - tubular - complex-multiple cell type adenoma - tubular - simple type adenoma - tubular-villous adenoma - tubulostromal adenoma - type A cell adenoma - type B cell adenoma - undifferentiated adenoma - vacuolated adenomyoepithelioma ameloblastoma anaplasia - moderate angioma angiosarcoma astrocytoma astrocytoma - cystic astrocytoma - fibrillary astrocytoma - pilocytic astrocytoma - protoplasmic atypia blastoma carcinoid

Field Name	Field Type	Formula / Entry Option
organ_id	Number	Serial Number with Current Value: “322” Increment: “1” Required value Unique values only Indexed
organ_name	Text	Value List (Custom Values): ~~~Integument System (AnatomyID# 1)~~~ Skin Skin - Anogenital region Skin - Dermis Skin - Dorsal region Skin - Epidermis Skin - Epidermis - Basal cell Skin - Epidermis - Hair matrix cell Skin - Epidermis - Keratinocyte Skin - Melanocyte Skin - Hair follicle Skin gland - Sebaceous gland Skin gland - Sweat gland Skin gland - Mucous gland Subcutis Mammary gland Mammary fat pad (Unspecified organ) - ~~~Special Sensory Organs (AnatomyID# 9)~~~ Eye Eye - Choroid Eye - Choroid - Melanocyte Eye - Conjunctiva Eye - Cornea Eye - Eyelid Eye - Harderian gland Eye - Iris Eye - Lacrimal gland Eye - Lens Eye - Retina Nose Nose - Nasal cavity Nose - Nasal cavity - Olfactory cell Nose - Nasal cavity - Nasal gland Nose - Nasal turbinate Nose - Olfactory gland Ear Ear - Inner ear/cochlea Ear - Middle ear Ear - Outer ear/external - ~~~Digestive System (AnatomyID# 7)~~~ Gingivae - Epithelium Mouth Oral cavity Tongue Salivary gland Salivary gland - Parotid Salivary gland - Sublingual Salivary gland - Submandibular Pharynx Esophagus Esophagus - Glandular Forestomach Forestomach - Squamocolumnar junction with the glandular stomach Stomach Stomach - Glandular Stomach - Glandular - Pyloric antrum Stomach - Neuroendocrine cell Stomach - Fundus Liver Liver (fetal) Liver - Hepatocyte Liver - Sinusoid Liver - Sinusoid - Ito cell Liver - Bile duct Gallbladder Intestine Intestine - Small Intestine Intestine - Small Intestine - Duodenum Intestine - Small Intestine - Jejunum Intestine - Small Intestine - Ileum Intestine - Small Intestine - Proximal

Field Name	Field Type	Formula / Entry Option
		Intestine - Small Intestine - Medial
		Intestine - Small Intestine - Distal
		Intestine - Ileocecal Junction
		Intestine - Large Intestine
		Intestine - Large Intestine - Cecum
		Intestine - Large Intestine - Colon
		Intestine - Large Intestine - Colon - Proximal
		Intestine - Large Intestine - Colon - Medial
		Intestine - Large Intestine - Colon - Distal
		Intestine - Large Intestine - Rectum
		Intestine - Large Intestine - Anus
		(Unspecified organ)
		-
		~~Respiratory System (AnatomyID# 4)~~~
		Lung
		Lung - Alveolus
		Lung - Alveolus - type II cell
		Lung - Bronchus
		Lung - Bronchiole
		Lung - Clara cell
		Larynx
		Trachea
		-
		~~Cardiovascular System (AnatomyID# 10)~~~
		Heart
		Blood vessel
		Blood vessel - Pericyte
		-
		~~Urinary System (AnatomyID# 11)~~~
		Kidney
		Kidney - Capsule
		Kidney - Cortex
		Kidney - Cortex - Glomerulus
		Kidney - Cortex - Renal tubule
		Kidney - Cortex - Renal tubule - Loop of Henle
		Kidney - Cortex - Renal tubule - Collecting duct
		Kidney - Medulla
		Renal pelvis
		Ureter
		Ureter - Transitional cell
		Urinary Bladder
		Urinary Bladder - Transitional cell
		Urethra
		Urethra - Gland
		Urethra - Transitional cell
		-
		~~Male Reproductive System (AnatomyID# 8)~~~
		Testis
		Testis - Germ cell
		Testis - Interstitial cell
		Testis - Leydig cell
		Testis - Seminiferous tubules
		Testis - Seminiferous tubules - Sertoli cell
		Rete testis
		Tunica vaginalis testis
		Epididymis
		Epididymis - Interstitial cell
		Ampullary gland
		Bulbourethral gland
		Coagulating gland
		Preputial gland
		Prostate gland
		Prostate gland - anterior lobe
		Prostate gland - dorsolateral lobe
		Prostate gland - epithelial cell
		Prostate gland - neuroendocrine cell
		Prostate gland - ventral lobe
		Vesicular gland
		Seminal vesicle
		Vas deferens
		Scrotum
		Penis
		Prepuce
		(Unspecified organ)
		-
		~~Female Reproductive System (AnatomyID# 5)~~~
		Clitoral gland
		Clitoris
		Ovary

Field Name	Field Type	Formula / Entry Option
		Ovary - Capsule
		Ovary - Germinal epithelium
		Ovary - Germ cell
		Ovary - Follicle
		Ovary - Follicular cell
		Ovary - Granulosa cell
		Ovary - Hilus cell
		Ovary - Interstitial cell
		Ovary - Lutein cell
		Ovary - Sertoli cell
		Ovary - Sex cord stromal cell
		Ovary - Theca cell
		Oviduct
		Placenta
		Placenta - Trophoblast
		Preputial gland
		Rete ovarii
		Uterus
		Uterus - Cervix
		Uterus - Endometrium
		Uterus - Endometrium - Stroma
		Uterus - Myometrium
		Uterus - Serosa
		Uterus - Uterine gland
		Vagina
		Vulva
		Yolk sac
		(Unspecified organ)
		-
		~~Endocrine Gland System (AnatomyID# 12)~~~
		Adrenal gland
		Adrenal gland - Cortex
		Adrenal gland - Medulla
		Adrenal gland - Subcapsular cell
		Pancreas
		Pancreas - Acinar cell
		Pancreas - Duct
		Pancreas - Islet of Langerhans
		Pancreas - Islet of Langerhans - Alpha cell
		Pancreas - Islet of Langerhans - Beta cell
		Pancreas - Islet of Langerhans - Delta cell
		Pancreas - Islet of Langerhans - PP cell
		Parathyroid gland
		Pineal gland
		Pituitary gland
		Pituitary gland - pars anterior
		Pituitary gland - pars intermedia
		Pituitary gland - pars distalis
		Thyroid gland
		Thyroid gland - medulla
		Thyroid gland - medulla - C cell
		Thyroid gland - parafollicular cell
		Thyroid gland - follicular cell
		(Unspecified organ)
		-
		~~Soft Tissues (AnatomyID# 3)~~~
		Mesodermal cell/mesoblast
		Muscle
		Muscle - Immature
		Muscle - Smooth
		Muscle - Striated
		Muscle - Striated - Melanocyte
		Muscle - Striated - Cardiac
		Muscle - Striated - Skeletal
		Muscle - Striated - Skeletal - Diaphragm
		Muscle - Striated - Skeletal - Limb
		Muscle - Striated - Skeletal - Trunk
		Myoepitheliocyte
		Adipose tissue
		Adipose tissue - Brown
		Adipose tissue - White
		Connective tissue
		Connective tissue - Cartilage
		Connective tissue - Fibroblast
		Connective tissue - Ligament
		Connective tissue - Tendon
		Synovial membrane
		Abdominal cavity
		Mediastinum

Field Name	Field Type	Formula / Entry Option
		Mesothelium
		Myocardium
		Pericardium
		Periosteum
		Peritoneum
		Peritoneum - Mesentery
		Peritoneum - Omentum
		Peritoneum - Parietal
		Peritoneum - Visceral
		Lymphatic vessel
		(Unspecified organ)
		-
		~~Lymphohematopoietic System (AnatomyID# 2)~~~
		Stem cell
		Myeloerythroid progenitor
		Erythroblast
		Erythrocyte
		Megakaryocyte
		Platelet
		Leukoblast
		Leukocyte
		Leukocyte - Lymphoblast
		Leukocyte - Lymphocyte
		Leukocyte - Lymphocyte - Immature B-lymphocyte
		Leukocyte - Lymphocyte - Pre-B-lymphocyte
		Leukocyte - Lymphocyte - Pro-B-lymphocyte
		Leukocyte - Lymphocyte - B-lymphocyte
		Leukocyte - Lymphocyte - B-lymphocyte - Plasma cell
		Leukocyte - Lymphocyte - B-lymphocyte - Follicular center cell
		Leukocyte - Lymphocyte - Immature T-lymphocyte
		Leukocyte - Lymphocyte - Natural killer (NK) cell
		Leukocyte - Lymphocyte - Null (non-T, non-B) cell
		Leukocyte - Lymphocyte - Pre-T-lymphocyte
		Leukocyte - Lymphocyte - Pro-T-lymphocyte
		Leukocyte - Lymphocyte - T-lymphocyte
		Leukocyte - Lymphocyte - Thymocyte
		Leukocyte - Monoblast
		Leukocyte - Promonocyte
		Leukocyte - Monocyte
		Leukocyte - Monocyte - Macrophage
		Leukocyte - Monocyte - Macrophage - Histiocyte
		Leukocyte - Myeloblast
		Leukocyte - Myelocyte (Granulocyte)
		Leukocyte - Myelocyte (Granulocyte) - Basophil
		Leukocyte - Myelocyte (Granulocyte) - Basophil - Mast cell
		Leukocyte - Myelocyte (Granulocyte) - Eosinophil
		Leukocyte - Myelocyte (Granulocyte) - Neutrophil
		Dendritic cell
		Dendritic cell - Langerhans' cell
		Reticular cell
		Bone marrow
		Thymus
		Thymus - Cortex
		Thymus - Medulla
		Spleen
		Spleen - Red pulp
		Spleen - White pulp
		Blood
		Blood (fetal)
		Lymph node
		Peyer's patch
		(Unspecified organ)
		-
		~~Skeletal System (AnatomyID# 13)~~~
		Bone
		Bone - Jaw
		Bone - Nose
		Bone - Skull
		Bone - Spinal canal
		Osteoblast
		Osteoclast
		Teeth
		(Unspecified organ)
		-
		~~Nervous System (AnatomyID# 14)~~~
		CNS
		CNS - Brain
		CNS - Brain - Astrocyte
		CNS - Brain - Basal ganglia

Field Name	Field Type	Formula / Entry Option
		CNS - Brain - Brain Stem CNS - Brain - Cerebellum CNS - Brain - Cerebellum - Posterior CNS - Brain - Cerebellum - Dorsal CNS - Brain - Cerebrum/cortex CNS - Brain - Choroid plexus CNS - Brain - Ependyma CNS - Brain - Forebrain CNS - Brain - Glial cell CNS - Brain - Hindbrain CNS - Brain - Hippocampus CNS - Brain - Hypothalamus CNS - Brain - Neuron CNS - Brain - Olfactory bulb CNS - Brain - Oligodendroglial cell CNS - Brain - Optic chiasma CNS - Brain - Optic nerve CNS - Brain - Striatum CNS - Brain - Thalamus CNS - Brain - Thalamus - Periventricular zone CNS - Brain - Undifferentiated cell CNS - Meninges CNS - Spinal cord CNS - Spinal cord - Neuron CNS - Spinal cord - Neuron - Ganglion Nerve Nerve - Raphe nuclei Nerve - Trigeminal Neuroblast PNS - Nerve sheath PNS - Neuron - Ganglion - Paraganglion PNS - Schwann cell (Unspecified organ) - ~~~Unspecified System (AnatomyID# 6)~~~ (Unspecified organ) Germ cell (sex not specified) Sex cord stromal cell (sex not specified) Embryonic stem cell (ES cell) Head Leg Mandible Melanocyte Muzzle Neck Paranasal sinus Pelvis Perianal Tail Do not allow user to override validation Required value Message: “The value in this field must appear on the organ master list. Add new organs to the master list before creating a record for them.” Indexed
anatomy_id	Number	Indexed
anatomical_sys_lkp	Text	Lookup: Use relationship “AnatomicalSystem” “anatomy_id” = “AnatomicalSystem::anatomy_id” If exact match, copy “AnatomicalSystem::anatomical_system” If no match: “Do not Copy” Indexed

Field Name	Field Type	Formula / Entry Option
anatomy_id	Number	Serial Number with Current Value: “15” Increment: “1” Required value Unique values only Indexed
anatomical_system	Text	Value List (Custom Values): Integument System Special Sensory Organs Digestive System Respiratory System Cardiovascular System Urinary System Male Reproductive System Female Reproductive System Endocrine Gland System Soft Tissues Lymphohematopoietic System Skeletal System Nervous System - Unspecified Indexed

Field Name	Field Type	Formula / Entry Option
agent_id	Number	Serial Number with Current Value: “448” Increment: “1” Required value Unique values only Indexed
agent	Text	Value List (Custom Values): ~~~Chemicals/Drugs~~~ 1-aminobenzo[a]pyrene (1-ABaP) 1-ethyl-1-nitrosourea (ethylnitrosourea) (ENU) 1-methyl-1-nitrosourea (MNU) 1-nitrobenzo[a]pyrene (1-NBaP) 1-nitrobenzo[a]pyrene trans-7,8-dihydrodiol (1-NBaP trans-7,8-dihydrodiol) 1-nitropyrene (1-NP) 1-propanol-3,3'-imino dimethanesulfonate 1,1-dimethylhydrazine (UDMH) 1,2-dibromoethane 1,2-dimethylhydrazine (DMH) 1,2-dimethylhydrazine-di-HCl (DMH) doxycycline 12-O-tetradecanoylphorbol-13-acetate (TPA) 1,3-butadiene 1,4-dimethanesulfonoxybutane (myleran) 1,4-dioxane 1,4-phenylenebis(methylene)selenocyanate (p-XSC) 2-acetylaminofluorene (AAF) 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP) 2-amino-3,4-dimethylmidazole[4,5-*f*]quinoline (MeIQ) 2-amino-3-methylimidazo[4,5-*f*]quinoline (IQ) 2-difluoromethylornithine (DFMO) 2-fluoroadenine 2-methoxybenzoylhydrazine 20-methylcholanthrene (MCA) 2,3,7,8-tetrachorodibenzo-p-dioxin (TCDD) 2,6-diaminopurine 3-aminobenzo[a]pyrene (3-ABaP) 3-methylcholanthrene (MCA) (MC) 3-nitrobenzo[a]pyrene (3-NBaP) 3-nitrobenzo[a]pyrene trans-7,8-dihydrodiol (3-NBaP trans-7,8-dihydrodiol) 3,4-dichlorophenyl-N-carbamoyl aziridine 4-aminosalicylic acid, sodium salt (4-ASA) 4-hydroxytamoxifen (4-OHT) 4-methoxybenzoylhydrazine 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) 4-nitroquinoline-1-oxide (4NQO) 4-nitroquinoline-N-oxide 4-o-tolylazo-o-toluidine (2-amino-5-azotoluene) 5-aminosalicylic acid, free acid (5-ASA) 5-chloroquine mustard 5-chloroquine mustard pamoate 5-methoxy-7-propylbenz[a]-anthracene (3-methoxy-10-propyl-1,2-benzanthracene) 5-methylchrysene (5-MeC) 6-nitrochrysene (6-NC) 6-thioguanine 7,12-dimethylbenz[a]anthracene (DMBA) 7H-dibenzo[c,g]carbazole (3,4,5,6-dibenzocarbazole) (DBC) 7-methylbenzo[a]pyrene (4'-methyl-3,4-benzopyrene) 8-methylbenzo[c]phenanthrene (2-methyl-3,4-benzophenanthrene) 9-cis-retinoic acid 9,10-dimethyl-1,2-benzanthracene (DMBA) 16,16-dimethyl-prostaglandin E2 (16,16dmPGE2) acetaminophen acetone acetylsalicylic acid (ASA) acronycine Adriamycin aflatoxin B1 AG-1478 airborne particulate matter (APM) allyl carbamate aminoguanidine hemisulfate aminopterin ampicillin angiostatin aniline mustard Aroclor 1254 aspirin (buffered) aspirin (non-buffered) aziridyl benzoquinone azoxymethane (AOM)

Field Name	Field Type	Formula / Entry Option
		batimastat (BB-94)
		beclomethasone dipropionate
		benz[a]anthracene (1,2-benzanthracene)
		benzalpurine mustard (Elderfield purine mustard)
		benzene
		benzimidazole mustard
		benzo[a]pyrene (BP) (BaP) (B[a]P)
		benzo[a]pyrene (3,4-benzopyrene)
		benzo[a]pyrene trans-7,8-dihydrodiol (BaP trans-7,8-dihydrodiol)
		benzo[b]fluoranthene (B[b]F)
		benzoylhydrazine
		benzotrichloride (BTC)
		benzyl carbamate
		beta-chloroethyl carbamate
		beta-deoxythioguanosine
		beta-hydroxyethyl carbamate
		beta-hydroxypropyl carbamate
		beta-naphthoflavone (betaNF)
		black tea
		black tea (decaffeinated)
		budesonide
		butyl carbamate
		butylated hydroxytoluene (BHT)
		caffeic acid phenethyl ester (CAPE)
		carbon disulfide
		(+)-catechin
		catechol
		celecoxib
		ceramide (N-palmitoylsphingosine)
		Cetrorelix acetate (SB-75)
		chenodeoxycholate (chenodeoxycholic acid)
		chlorambucil mustard
		chlordane
		chloroethyl carbamate
		chloroethylmesulfan
		chloroform
		chloroquine mustard
		chloroquine mustard pamoate
		chlorpromazine
		cholestyramine
		chromium(III) chloride
		cigarette smoke
		cisplatin
		clofibrate
		corn oil
		crocidolite asbestos
		croton oil
		curcumin (diferuloylmethane)
		cyclohexyl-N-carbamoyl aziridine
		cyclopental[c,d]pyrene (CPP)
		cyclophosphamide (Cytoxan)
		Cyclosporin A
		dacarbazine
		DDT
		dexamethasone (DEX)
		dextran sulfate sodium (DSS)
		diacylglycerol (DAG)
		dibenz[a,h]acridine (1,2,5,6-dibenzacridine)
		dibenz[a,h]anthracene (1,2,5,6-dibenzanthracene)
		dibenz[a,j]aceanthrylene (15,16-benzdehydrocholanthrene)
		dibenzo[a,l]pyrene (DB[a,l]P)
		dibutylnitrosamine
		diepoxybutane (L-butadiene epoxide)
		diepoxypiperazine
		diethyl bicarbamate
		diethylhexylphthalate (DEHP)
		difluoromethylornithine (DFMO)
		dimethyl sulfoxide (DMSO)
		dimethylbenzanthracene (DMBA)
		dimethylnitrosamine (DMN)
		emetine
		endostatin
		environmental cigarette smoke (ECS)
		environmental tobacco smoke (ETS)
		epodyl (diglycidyltriethylene glycol)
		epoxypropidine
		estradiol mustard
		ether
		ethyl methanesulfonate (EMS)

Field Name	Field Type	Formula / Entry Option
		ethylene diurethane
		ethylene oxide
		ethylene thiourea
		ethylidene diurethane
		ferric-nitrilotriacetate (Fe-NTA)
		folate
		FTI-276 (farnesyltransferase inhibitor 276)
		FTI L-744,832
		glycidol
		glycyrrhizin (GL)
		green tea
		green tea (decaffeinated)
		haloperidol
		Helicobacter felis
		hexyl carbamate
		hydrazine sulfate
		hydroquinone (HQ)
		hydroquinone mustard (Weatherbee mustard)
		imidazole mustard
		iproniazid
		isoamyl carbamate
		isoniazid
		isonicotinic acid
		isophosphamide
		isoprene
		isopropyl carbamate
		kojic acid
		letrozole
		lovastatin
		lyophilized strawberries
		m-chlorophenyl-N-carbamoyl aziridine
		mainstream cigarette smoke condensate (MCSC)
		mainstream cigarette smoke (MCS)
		mannitol mustard
		mannitol myleran
		melphalan (L-phenylalanine mustard) (L-sarcolysin)
		metaproterenol
		methallyl carbamate
		methapyrilene
		methyl carbamate
		methylcholanthrene (MCA)
		methylene chloride (MC)
		methylene diurethane
		MF-tricyclic
		mineral oil
		myo-inositol
		N-(4-hydroxyphenyl)retinamide (4HPR)
		N-[4-(3-chloro-4-fluoro-phenylamino)-quinazolin-6-yl]acrylamide, (CFPQA)
		N-acetyl-S-carbethoxycysteine
		N-acetylcysteine (NAC)
		N-acetylethyl carbamate
		N-amyl-N-methylnitrosoamine (AMN)
		N-butyl-N-(4-hydroxybutyl)nitrosamine (BBN)
		N-butylurethane
		N-cyanoacetylethyl carbamate
		N-dibutylurethane
		N-diethylnitrosamine (N,N-diethylnitrosamine) (N-nitrosodiethylamine) (DEN) (NDEA)
		N-diethylurethane
		N-dimethylurethane
		N-diphenylurethane
		N-dipropylurethane
		N-disopropylurethane
		N-ethyl-N'-nitro-N-nitrosoguanidine
		N-ethyl-N'-nitro-N-nitroguanidine (ENNG)
		N-ethyl-N-nitrosourea (N-nitrosoethylurea) (ENU)
		N-ethylurethane
		N-hydroxy-2-acetylaminofluorene
		N-hydroxyethyl carbamate
		N-isopropyl-a-(2-methylhyrazino)-p-toluamide hydrochloride
		N-isopropylurethane
		N-methyl-N-nitrosourea (methylnitrosourea) (N-nitrosomethylurea) (MNU)
		N-methylnaphthyl carbamate
		N-methylurethane
		N,N-dimethylolmethoxyethyl carbamate
		N-nitrosodimethylamine (NDMA)
		N-nitrosomethylbenzylamine (NMBA)
		N-nitroso-N-methylurethane (NMU)
		not specified
		N-phenylisopropyl carbamate

Field Name	Field Type	Formula / Entry Option
		N-propylurethane
		naphthalene
		naphthylamine mustard
		nicardipine hydrochloride (Nicardipine)
		nickel subsulfide
		nimesulide
		nitrogen dioxide
		nitrogen mustard (HN2)
		nitrosopiperidine
		nordihydroguairetic acid (NDGA)
		NS-398
		o-aminoazotoluene
		o-ethoxyphenyl-N-carbamoyl aziridine
		Omeprazole
		OPSPA
		p-cresidine
		p-fluorophenyl-N-carbamoyl aziridine
		p-methoxyphenyl-N-carbamoyl aziridine
		p-tolyl-N-carbamoyl aziridine
		Pentasa
		phenacetin
		phenazopyridine
		phenesterin
		phenformin
		phenobarbital (PB)
		phenobarbitone (PB)
		phenyl carbamate
		phenylhydrazine
		phenyl-N-carbamoyl aziridine
		phorbol 12-myristate 13-acetate (phorbol ester) (PMA)
		piroxicam
		piperonyl butoxide (alpha-[2-(2-butoxyethoxy)ethoxy-4,5-methylenedioxy-2-propyltoluene)
		polyethylene glycol
		polyethylene glycol 8000 (PEG 8000)
		polyI/polyC
		potassium arsenite
		pristane (2,6,10,14-tetramethylpentadecane)
		propyl carbamate
		propylene glycol
		quercetin
		quinacrine ethyl mustard
		quinacrine ethyl mustard/2
		quinacrine mustard
		quinacrine propyl mustard
		quinacrine propyl mustard/2
		R-flurbiprofen (R-FB) (E-7869)
		R94138
		rebamipide
		reserpine
		retinoic acid (RA)
		rutin
		saline
		S-carbamylcysteine
		S-carbobenzyloxycysteine
		sec-butyl carbamate
		selenomethionine
		silica
		sn-1,2-didecanoylglycerol (DiC10)
		sodium arsenite
		sphingolipid mix
		sphingomyelin
		stilbamidine
		streptozotocin
		SU5416
		sulfamethoxazole
		sulfasalazine (SASP)
		sulfisoxazole
		sulfur mustard (B,B'-dichlorodiethylsulfide)
		sulindac
		sulindac sulfide
		sulindac sulfone (FGN-1)
		tamoxifen (TAM)
		Taxol
		tetrachloroethylene (TCE)
		theaflavins
		thioTEPA (thio-TEPA) (TESPA)
		thiouracil
		TNP470 (AGM-1470)
		tocopherol acetate

Field Name	Field Type	Formula / Entry Option
		tolbutamide
		tricaprylin
		trichloroethyl carbamate
		triethylene melamine (TEM)
		triphenylethylene
		troglitazone
		uracil mustard
		urban air pollution
		urethane (urethan) (ethyl carbamate) (EC)
		uroguanylin
		vehicle (unspecified)
		vinyl carbamate (VC)
		vinyl chloride (chloroethylene)
		WY-14,643
		ZnCl2
		ZnSO4
		-
		~~Growth Factors~~~
		insulin-like growth factor 1 (IGF1) (IGF-1) (human recombinant)
		interleukin 10 (IL10)(IL-10)
		interleukin 12 (IL12)(IL-12)
		-
		~~Hormones~~~
		19-nor-progesterone
		androsterone
		bovine pituitary extract
		cortisone
		dehydroepiandrosterone (DHEA)
		diethylstilbestrol (DES)
		dihydrotestosterone (DHT)
		estradiol (17beta-estradiol) (E2)
		estradiol benzoate
		estradiol dipropionate
		estrogen
		estrone
		horse anti-mouse anitlymphocyte serum (HALS)
		human chorionic gonadotropin (hCG)
		male gonadal ridge implantation
		normal horse serum (NHS)
		ovarian implantation
		ovariectomy
		ovariectomy - incomplete
		ovariectomy - unilateral
		pituitary isograft
		pregnant mare serum gonadotropin (PMSG)
		progesterone
		testosterone
		-
		~~Radiation~~~
		alpha-radiation
		Americum-241 (Am-241) (²⁴¹Am)
		beta-radiation
		Californium-252 (Cf-252) (²⁵²Cf) fission neutron radiation
		gamma-radiation
		halogen light
		heavy ion radiation
		Iodine-131 (I-131) (¹³¹I)
		ionizing radiation
		neutron-radiation
		Plutonium-239 (Pu-239) (²³⁹Pu)
		radiation (unspecified type)
		Radium-224 (Ra-224) (²²⁴Ra)
		Radium-226 (Ra-226) (²²⁶Ra)
		radon
		Strontium-90 (Sr-90) (⁹⁰Sr)
		ultraviolet radiation (UV)
		ultraviolet-B radiation (UVB)
		Uranium-233 (U-233) (²³³U)
		uranium ore dust
		X-radiation
		-
		~~Viruses~~~
		adenovirus (recombinant, expressing Cre recombinase)
		adenovirus (recombinant, expressing LacZ)
		adenovirus (parent virus)
		adenovirus (B-galactosidase expressing)
		adenovirus (expressing dominant-negative mutant Map2k4)
		A-MuLV (Abelson murine leukemia virus) (A-MuLV-P160)
		A-MuLV-P90A (C-terminally truncated Abelson murine leukemia virus)

Field Name	Field Type	Formula / Entry Option
		Avian leukosis virus encoding activated human EGFR (RCAS-EGFR*) Avian leukosis virus encoding human CDK4 (RCAS-cdk4) Avian leukosis virus encoding mouse Fgf2 (RCAS-bFGF) Avian leukosis virus encoding human ALPP (RCAS-AP) Avian leukosis virus encoding polyoma virus middle T antigen (RCAS-MTA) Avian leukosis virus encoding PDGF (RCAS-PDGF) Avian leukosis virus encoding G12D K-Ras (RCAS-Kras) Avian leukosis virus encoding full length chicken Sonic hedgehog (RCAS-Shh) Avian leukosis virus encoding full length human c-Myc (RCAS-MYC) Avian leukosis virus encoding activated Akt (RCAS-Akt) Avaian leukosis virus encoding human PDGF-B and eGFP (RCAS-PBIG) Avaian leukosis virus encoding human PDGF-B (RCAS-PB) BALB/Tennant leukemia virus Friend leukemia virus Friend leukemia virus - "regressing" (RFV) Friend leukemia virus - "conventional" (CFV) Graffi MuLV (Graffi murine leukemia virus) Gross leukemia virus MLV (M-MuLV) (MoMuLV) (Moloney murine leukemia virus) MoMuLV-TB (the TB strain of Moloney murine leukemia virus) MMTV (mouse mammary tumor virus) murine leukemia virus (MLV) murine retrovirus containing human PDGFB cDNA NIV (nodule-inducing virus) R7 (a MoMuSV 124 variant) vaccinia virus vaccinia virus (inactivated) - ~~~Other~~~ adrenalectomy anti-CD8+ monoclonal antibody (anti-CD8+ mAb) anti-CTLA-4 antibody (anti-CTLA-4 Ab) anti-IFNgamma monoclonal antibody (anti-IFNgamma mAb) gastrectomy with esophagojejunostomy mechanical stimulation peptide Ala-Glu-Asp-Gly peptide Lys-Glu Rat Gastrimmune splenectomy thymectomy vaccine - irradiated GMTRAMP-C1/C2 cells vaccine - irradiated TRAMP-C1/C2 cells wounding - ~~~Not Specified~~~ (see notes) Unique values only Indexed
agent_type	Text	Value List (Custom Values): Bacteria Chemical/Drug Growth Factor Hormone Radiation Signaling molecule Virus Other Not Specified Indexed

Field Name	Field Type	Formula / Entry Option
--- Entry fields ---	Global (Number)	
syn_id	Number	Required value Indexed
instance_id	Number	Required value Indexed
citation_id	Number	Required value Indexed
--- Lookup fields ---	Global (Number)	
synonym_lkp	Text	Lookup: Use relationship “Synonym” “syn_id” = “Synonym::syn_id” If exact match, copy “Synonym::synonym” If no match: “Do not Copy”
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy”
--- Global fields ---	Global (Number)	
trash_can	Global (Container)	
--- Calculation fields ---	Global (Number)	
synonyms_calc	Calculation (Text)	Unstored calculation = TumorInstance::organ_lkp & " " & TumorInstance::tumor_subclass & "; " & synonym_lkp & "; " & TumorInstance::<Field Missing>

Field Name	Field Type	Formula / Entry Option
syn_id	Number	Serial Number with Current Value: “2660” Increment: “1” Required value Unique values only Indexed
synonym	Text	Required value Indexed
count_related	Calculation (Number)	Unstored calculation = Count(InstanceSynonymLink::instance_id)

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
incidence_id	Number	Serial Number with Current Value: “24836” Increment: “1” Do not allow user to override validation Required value Unique values only Only allow values of type: “Numeric Only” Indexed
_____	Global (Number)	
--- Entry fields ---	Global (Number)	
instance_id	Number	Required value Indexed
citation_id	Number	Required value Indexed
breeding_status	Text	Auto-enter: “reproductive status not specified” Value List (By Field): “breeding_status” Required value Indexed
infection_status	Text	Indexed
colony_size	Number	Indexed
num_affected	Number	Indexed
incidence	Text	Auto-enter calculation = Case(calc_incidence ≥ 9.95, Round(calc_incidence, 0), calc_incidence < 9.95, Round(calc_incidence, 1)) Validation calculation = If(PatternCount(incidence, "-") = 1, 0, 1) Do not allow user to override validation Required value Message: “This is a required field. Incidence ranges cannot be entered. Enter 2 incidence records, one for the hig value and one for the low value.” Indexed
incidence_equivalent	Number	Auto-enter calculation = Case(incidence = "very high", 81, incidence = "high", 51, incidence = "moderate", 31, incidence = "low", 19, incidence = "very low", 9, incidence = "sporadic", "0.9", incidence = "observed", "0.1", incidence) Do not allow user to override validation Required value Only allow values in the range from “0” to “100” Message: “This is a required field. Values entered in this field must be between 0 and 100.” Indexed
age_tumor_onset	Text	Indexed
age_tumor_detection	Text	Indexed
note	Text	Indexed
_____	Global (Number)	
--- Calculation fields ---	Global (Number)	
calc_incidence	Calculation (Number)	Indexed = (num_affected / colony_size) * 100
calc_num	Calculation (Number)	= colony_size * (incidence_equivalent / 100)
_____	Global (Number)	
--- Global fields ---	Global (Number)	
trash_can	Global (Container)	
--- Temporary fields ---	Global (Number)	
global	Global (Text)	
global2	Global (Text)	
_____	Global (Number)	
--- Lookup fields ---	Global (Number)	
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy” Indexed
--- test fields ---	Global (Number)	
incidence_check_10_or_ove r	Calculation (Text)	Indexed = Case(Round(calc_incidence, 0) = Round(incidence, 0), "OK", incidence = "observed", "OK", incidence = "very low", "OK", incidence = "low", "OK", incidence = "moderate", "OK", incidence = "high", "OK", incidence = "very high", "OK", incidence = "sporadic", "OK", "PROBLEM")
incidence_check_under_10	Calculation (Text)	Indexed = Case(Round(calc_incidence, 1) = Round(incidence, 1), "OK", incidence = "observed", "OK", incidence = "very low", "OK", incidence = "low", "OK", incidence = "moderate", "OK", incidence = "high", "OK", incidence = "very high", "OK", incidence = "sporadic", "OK", "PROBLEM")
incidence_equiv_check	Calculation (Text)	Indexed = Case(Round(incidence, 1) = Round(incidence_equivalent, 1), "OK", incidence = "observed", "observed", incidence = "very low", "very low", incidence = "low", "low", incidence = "moderate", "moderate", incidence = "high", "high", incidence = "very high", "very high", incidence = "sporadic", "sporadic", "PROBLEM")

Field Name	Field Type	Formula / Entry Option
--- Entry fields ---	Global (Number)	
instance_id	Number	Required value Indexed
path_id	Number	Required value Indexed
citation_id	Number	Required value Indexed
--- Lookup fields - Pathology ---	Global (Number)	
description_lkp	Text	Lookup: Use relationship “Pathology” “path_id” = “Pathology::path_id” If exact match, copy “Pathology::description” If no match: “Do not Copy” Indexed
age_necrop_lkp	Text	Lookup: Use relationship “Pathology” “path_id” = “Pathology::path_id” If exact match, copy “Pathology::age_at_necropsy” If no match: “Do not Copy”
breeding_lkp	Text	Lookup: Use relationship “Pathology” “path_id” = “Pathology::path_id” If exact match, copy “Pathology::breeding_status” If no match: “Do not Copy”
infection_lkp	Text	Lookup: Use relationship “Pathology” “path_id” = “Pathology::path_id” If exact match, copy “Pathology::infection_status” If no match: “Do not Copy”
note_lkp	Text	Lookup: Use relationship “Pathology” “path_id” = “Pathology::path_id” If exact match, copy “Pathology::note” If no match: “Do not Copy” Indexed
image_id_lkp	Number	Lookup: Use relationship “Image” “path_id” = “Image::path_id” If exact match, copy “Image::image_id” If no match: “Do not Copy” Indexed
--- Lookup fields - Tumor ---	Global (Number)	
organ_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::organ_lkp” If no match: “Do not Copy” Indexed
subclass_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::tumor_subclass” If no match: “Do not Copy” Indexed
organ_aff_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::organ_aff_lkp” If no match: “Do not Copy” Indexed
tumor_mode_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::tumor_mode” If no match: “Do not Copy”
agent1_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent1_lkp” If no match: “Do not Copy”
agent2_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent2_lkp” If no match: “Do not Copy”
agent3_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::agent3_lkp” If no match: “Do not Copy”
all_agents_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::all_agents” If no match: “Do not Copy” Indexed
strain_id_lkp	Number	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_origin_id”

Field Name	Field Type	Formula / Entry Option
		If no match: “Do not Copy” Indexed
strain_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_lkp” If no match: “Do not Copy”
strain_sex_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_sex_lkp” If no match: “Do not Copy”
strain_type_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_type_lkp” If no match: “Do not Copy”
strain_note_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_note_lkp” If no match: “Do not Copy”
strain_jax_lkp	Text	Lookup: Use relationship “TumorInstance” “instance_id” = “TumorInstance::instance_id” If exact match, copy “TumorInstance::strain_jax_lkp” If no match: “Do not Copy”
--- Lookup fields - Reference ---	Global (Number)	
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy”
person_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::person” If no match: “Do not Copy” Indexed
--- Global fields ---	Global (Number)	
camera_pic	Global (Container)	
trash_can	Global (Container)	
--- Calculation fields ---	Global (Number)	
toggle_camera	Calculation (Container)	Unstored calculation = Case(IsEmpty(image_id_lkp), "", camera_pic)
--- New fields ---	Global (Number)	

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
path_id	Number	Serial Number with Current Value: “2402” Increment: “1” Required value Unique values only Indexed
--- Entry fields ---	Global (Number)	
description	Text	Required value Indexed
age_at_necropsy	Text	Indexed
breeding_status	Text	Value List (By Field): “breeding_status” from file “TumorIncidence” Required value Indexed
infection_status	Text	
note	Text	Indexed
prev_stage	Number	Indexed
next_stage	Number	Indexed
other_path_id	Number	Indexed
--- Lookup fields ---	Global (Number)	
--- Calculation fields ---	Global (Number)	
count_related	Calculation (Number)	Unstored calculation = Count(TumorPathologyLink::instance_id)
--- New fields ---	Global (Number)	
pathologist_lkp	Calculation (Text)	Unstored calculation = TumorPathologyLink::person_lkp
pathologist_bib_id_lkp	Calculation (Number)	Unstored calculation = TumorPathologyLink::citation_id

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
image_id	Number	Serial Number with Current Value: “884” Increment: “1” Required value Unique values only Indexed
--- Entry fields ---	Global (Number)	
path_id	Number	Required value Indexed
citation_id	Number	Required value Indexed
image_caption	Text	Indexed
magnification	Text	
species	Text	Auto-enter: “mouse” Indexed
fixative	Text	Indexed
stain	Text	Indexed
path	Text	Unique values only Indexed
path2	Text	Auto-enter calculation = path Indexed
entry_notes	Text	Indexed
copyright	Text	Indexed
image	Container	
---Lookup fields---	Global (Number)	
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy” Indexed
person_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::person” If no match: “Do not Copy” Indexed
---Calculation fields---	Global (Number)	
path_path2_same	Calculation (Number)	= If(path = path2, 1, 0)

Field Name	Field Type	Formula / Entry Option
image_id	Number	Indexed
probe_id	Number	Indexed
probe_type	Calculation (Text)	Unstored calculation = Probe::probe_type
probe_name	Calculation (Text)	Unstored calculation = Probe::probe_name
probe_URL	Calculation (Text)	Unstored calculation = Probe::probe_URL
probe_notes	Calculation (Text)	Unstored calculation = Probe::probe_notes
image_caption	Calculation (Text)	Unstored calculation = Image::image_caption
probe_target	Calculation (Text)	Unstored calculation = Probe::probe_target
counterstain	Calculation (Text)	Unstored calculation = Probe::counterstain
supplier	Calculation (Text)	Unstored calculation = Probe::supplier
supplier_ref_id	Calculation (Number)	Unstored calculation = Probe::supplier_ref_id

Field Name	Field Type	Formula / Entry Option
probe_id	Number	Serial Number with Current Value: “104” Increment: “1” Required value Unique values only Indexed
supplier_ref_id	Number	Indexed
probe_type	Text	Indexed
probe_name	Text	Indexed
probe_URL	Text	Indexed
probe_notes	Text	Indexed
probe_target	Text	Indexed
counterstain	Text	
supplier	Calculation (Text)	Unstored calculation = SupplierRef::person

Field Name	Field Type	Formula / Entry Option
--- Entry fields ---	Global (Number)	
tin_id	Number	Required value Indexed
instance_id	Number	Required value Indexed
citation_id	Number	Required value Indexed
--- Lookup field ---	Global (Number)	
note_lkp	Text	Lookup: Use relationship “TumorInstanceNote” “tin_id” = “TumorInstanceNote::tin_id” If exact match, copy “TumorInstanceNote::note” If no match: “Do not Copy” Indexed
jnum_lkp	Text	Lookup: Use relationship “BIB” “citation_id” = “BIB::citation_id” If exact match, copy “BIB::jnum” If no match: “Do not Copy”
--- Global fields ---	Global (Number)	
trash_can	Global (Container)	

Field Name	Field Type	Formula / Entry Option
tin_id	Number	Serial Number with Current Value: “2242” Increment: “1” Required value Unique values only Indexed
note	Text	Required value Indexed
count_related	Calculation (Number)	Unstored calculation = Count(InstanceNoteLink::instance_id)

Field Name	Field Type	Formula / Entry Option
--- Serial field ---	Global (Number)	
progression_id	Number	Serial Number with Current Value: “789” Increment: “1” Required value Unique values only Indexed
--- Entry fields ---	Global (Number)	
parent_id	Number	Indexed
progression_type	Text	Indexed
child_id	Number	Indexed
host_id	Number	Indexed
--- Lookup fields parent ---	Global (Number)	
parent_organ_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::organ_lkp” If no match: “Do not Copy”
parent_subclass_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::tumor_subclass” If no match: “Do not Copy”
parent_organ_aff_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::organ_aff_lkp” If no match: “Do not Copy”
parent_mode_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::tumor_mode” If no match: “Do not Copy”
parent_agent1_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::agent1_lkp” If no match: “Do not Copy”
parent_agent2_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::agent2_lkp” If no match: “Do not Copy”
parent_agent3_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::agent3_lkp” If no match: “Do not Copy”
parent_all_agents	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::all_agents” If no match: “Do not Copy”
parent_strain_id_lkp	Number	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::strain_origin_id” If no match: “Do not Copy” Indexed
parent_strain_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::strain_lkp” If no match: “Do not Copy”
parent_strain_sex_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::strain_sex_lkp” If no match: “Do not Copy”
parent_strain_type_lkp	Text	Lookup: Use relationship “Parent” “parent_id” = “Parent::instance_id” If exact match, copy “Parent::strain_type_lkp” If no match: “Do not Copy”
--- Lookup fields child ---	Global (Number)	
child_organ_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::organ_lkp” If no match: “Do not Copy”
child_subclass_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::tumor_subclass” If no match: “Do not Copy”
child_organ_aff_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::organ_aff_lkp” If no match: “Do not Copy” Indexed

Field Name	Field Type	Formula / Entry Option
child_mode_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::tumor_mode” If no match: “Do not Copy”
child_agent1_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::agent1_lkp” If no match: “Do not Copy”
child_agent2_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::agent2_lkp” If no match: “Do not Copy”
child_agent3_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::agent3_lkp” If no match: “Do not Copy”
child_all_agents	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::all_agents” If no match: “Do not Copy”
child_strain_id_lkp	Number	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::strain_origin_id” If no match: “Do not Copy”
child_strain_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::strain_lkp” If no match: “Do not Copy”
child_strain_sex_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::strain_sex_lkp” If no match: “Do not Copy”
child_strain_type_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::strain_type_lkp” If no match: “Do not Copy”
child_zero_incidence_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::zero_incidence” If no match: “Do not Copy” Indexed
child_incidence_range_lkp	Text	Lookup: Use relationship “Child” “child_id” = “Child::instance_id” If exact match, copy “Child::incidence_range” If no match: “Do not Copy”
--- Lookup fields host ---	Global (Number)	
host_strain_lkp	Text	Lookup: Use relationship “Host” “host_id” = “Host::source_id” If exact match, copy “Host::strain_name” If no match: “Do not Copy”
host_strain_sex_lkp	Text	Lookup: Use relationship “Host” “host_id” = “Host::source_id” If exact match, copy “Host::sex” If no match: “Do not Copy”
host_strain_type_lkp	Text	Lookup: Use relationship “Host” “host_id” = “Host::source_id” If exact match, copy “Host::source_type” If no match: “Do not Copy”
--- Global fields ---	Global (Number)	
trash_can	Global (Container)	
--- Calculation fields ---	Global (Number)	
zero_incid_met_organ	Calculation (Text)	Indexed = Case(progression_type = "metastasis", child_zero_incidence_lkp & ", " & child_organ_aff_lkp, progression_type ≠ "metastasis", "")
--- test fields ---	Global (Number)	