

Mouse Tumor Biology (MTB) Database

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MTB Database

<http://tumor.informatics.jax.org>

Objective: Provide Web-based access to primary research data on the pathobiology of cancer in genetically defined strains of laboratory mice.

MTB was first made available to the public in the fall of 1998.

MTB Database

<http://tumor.informatics.jax.org>

Hardware

- MTB server: Mac G4 dual processor
- Curator machines: Mac G5 dual processor

Server software

- FileMaker Pro 5.0 Unlimited (for MTB prototype)
- WebSTAR 4.2
- Filemaker's Web Server Connector

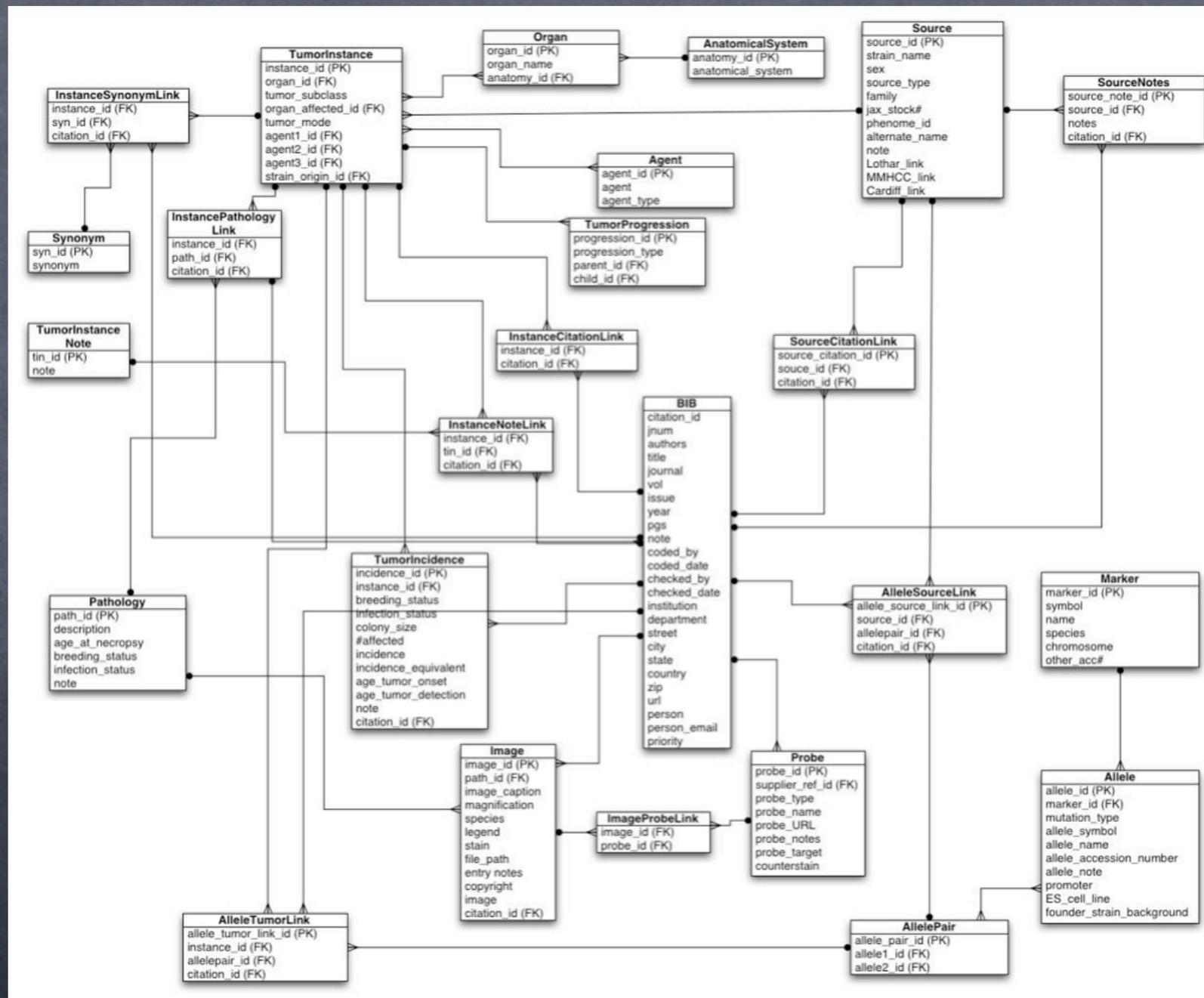
Curator software

- FileMaker Pro 5.5

- MTB is currently in the process of migrating to Sybase

MTB Database

<http://tumor.informatics.jax.org>



MTB Database

<http://tumor.informatics.jax.org>

Web log stats (January-December 2003)

- ~850 hits/day
- 14,454 unique visitors
- 3,230 repeat visitors
- 83 different countries worldwide
- ISPs, universities, medical centers, biotech companies, search engines, etc.

MTB Database

<http://tumor.informatics.jax.org>

Database statistics (as of 25 Feb 2004)

- 14,102 Tumor records
- 3,051 Strain records
- 20,991 Tumor frequency records
- 715 Pathology images
- 865 Curated citations

MTB Database

<http://tumor.informatics.jax.org>

- What we curate
 - Tumors (spontaneous and induced) arising in mice
- What we DON'T curate
 - Tumor cell lines
 - Transplanted tumors
 - Human tumor xenografts

MTB Database

<http://tumor.informatics.jax.org>

- Data acquisition
 - Peer-reviewed scientific literature
 - Pathology data from TJL pathologists
 - Submission of pathology data from researchers
- Data curated by biologists
- Adheres to standardized nomenclature
 - Gene symbols and names
 - Allele symbols and names
 - Strain names

MTB Database

<http://tumor.informatics.jax.org>

Controlled vocabularies used

- Tissue/Organ/Cell type
- Anatomical system
- Tumor classification
- Strain types
- Breeding status
- Sex
- Treatment type
- Treatment agents
- Mutation types
- Journals

MTB Database

<http://tumor.informatics.jax.org>

Links to other resources

- Mouse Genome Informatics (MGI) (<http://www.informatics.jax.org>)
- Mouse Phenome Database (MPD) (<http://www.jax.org/phenome/>)
- Festing's List of Inbred Strains (http://www.informatics.jax.org/external/festing/search_form.cgi)
- Biology of the Mammary Gland Web Site (<http://mammary.nih.gov/>)
- Mammary Cancer in Humans and Mice: A Tutorial for Comparative Pathology (<http://ccm.ucdavis.edu/bcancercd/>)
- Mouse repositories (links to the IMSR will allow MTB to link to these and other resources)
 - JAXMice® Web Site (<http://jaxmice.jax.org/>)
 - Mouse Models of Human Cancers Consortium (MMHCC) Repository (<http://mouse.ncifcrf.gov/>)

MTB Home Page

Mouse Tumor Biology Database Project

http://tumor.informatics.jax.org/FMPro?-db=TumorInstance

Mouse Tumor Biology Database (MTB)

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[Tumor Search](#) | [Strain Search](#) | [Genetics Search](#) | [Pathology Image Search](#) | [Reference Search](#)

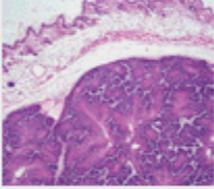
Quick Organ/Tissue Search

ANY
Adipose tissue
Adipose tissue - Brown
Adipose tissue - White
Adrenal gland
Adrenal gland - Cortex
Adrenal gland - Medulla
Adrenal gland - Subcapsular cell
Ampullary gland
Blood vessel
Blood vessel - Pericyte
Bone
Bone marrow
Bone - Nose

Retrieve Reset Form

 [Tumor Frequency Grid](#)
(Spontaneous tumors in inbred mice)

[JAX Path](#)
electronic submission of pathology data

 [Tumor Search](#)

 [Strain Search](#)

 [Genetics Search](#)

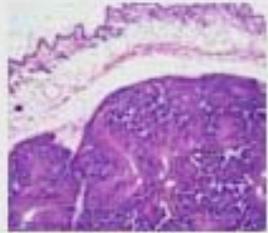
 [Pathology Image Search](#)
NEW New feature: Antibody summary ([html](#)) ([Excel](#)) NEW

 [Reference Search](#)

Search for a tumor record by **MTB accession ID:** (Example: MTB:80)

MTB: Retrieve Reset Form

Advanced Query Forms



[Tumor Search](#)



[Strain Search](#)



[Genetics Search](#)



[Pathology Image Search](#)



[Reference Search](#)

- **Tumor Search**
 - Anatomical system, organ name, tumor classification, metastatic status, tumor frequency
- **Strain Search**
 - Strain name, sex, strain type (inbred, transgenic, induced mutant, targeted mutant)
- **Genetics Search**
 - Germ-line mutations in the host strain, somatic mutations or chromosomal aberrations in the tumor
- **Pathology Image Search**
 - Pathology images & descriptive text, searchable by organ/tissue or probe
- **Reference Search**
 - Literature citations, unpublished sources

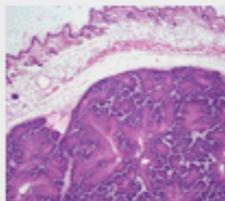
Tumor Search Results

Tumor Search Results

http://tumor.informatics.jax.org/FMPro



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Tumor Search Results

Displaying records 1 through 20 of 36 records found.

[Next page of records](#) ▶

| MTB ID | Tumor Name | Organ/ Tissue Affected | Treatment Agents | Strain Name Sex | Tumor Frequency Range (%) | Pathology Images | Metastasizes to the: | Additional Information |
|-----------|---|------------------------------|---------------------|--|---------------------------------|---------------------|-------------------------|-------------------------------------|
| MTB:10145 | Lung - Alveolus adenocarcinoma | Lung - Alveolus | None (Spontaneous) | 129S2/SvPas-Kras2 ^{tm2Tyj/+} sex not specified | 100 | | Kidney Lymph node | Show Record Details |
| MTB:10151 | Lung - Alveolus adenocarcinoma | Lung - Alveolus | None (Spontaneous) | 129S2/SvPas-Kras2 ^{tm3Tyj/+} sex not specified | 100 | | Kidney Lymph node | Show Record Details |
| MTB:1715 | Lung tumor | Lung | None (Spontaneous) | A sex not specified | 4-100 | | | Show Record Details |
| MTB:1273 | Lung tumor | Lung | None (Spontaneous) | A/J female | 0-100 | | | Show Record Details |
| MTB:11838 | Lung adenoma | Lung | None (Spontaneous) | A/JOldHsd female | 100 | | | Show Record Details |
| MTB:10129 | Lung - Alveolus adenocarcinoma | Lung - Alveolus | None (Spontaneous) | B6;129S2-Kras2 ^{tm2Tyj/+} sex not specified | 0-100 | | Kidney Lymph node | Show Record Details |
| MTB:10137 | Lung - Alveolus adenocarcinoma | Lung - Alveolus | None (Spontaneous) | B6;129S2-Kras2 ^{tm3Tyj/+} sex not specified | 0-100 | | Kidney Lymph node | Show Record Details |
| MTB:7863 | Lung adenocarcinoma - well-differentiated | Lung | None (Spontaneous) | B6;CD-1-TgN(IgTp-ras)11Yik female | 100 | | | Show Record Details |

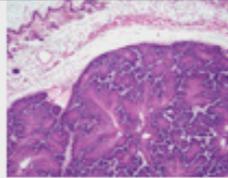
Tumor Record Details

Tumor Details

http://tumor.informatics.jax.org/FMPro?-db=TumorInstance&-format= Google

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Tumor Details for MTB:10129

| | |
|--------------------------------|------------------------|
| Organ/Tissue of Origin: | Lung - Alveolus |
| Tumor Classification: | adenocarcinoma |
| Organ/Tissue Affected: | Lung - Alveolus |
| Treatment: | None (Spontaneous) |

| | |
|----------------------|---|
| Strain Name: | B6;129S2-Kras2^{tm2Tyi}/+ |
| Sex: | sex not specified |
| Strain Type: | targeted mutation (knockout) |
| Strain Notes: | Mice heterozygous for a targeted mutation of Kras2 (K-ras), also called "K-ras2 ^{LA1} ". Spontaneous somatic recombination leads to the expression of an activated oncogenic Kras2 protein. The genetic background was a mix of C57BL/6 and 129S2/SvPas. |

| Metastases/Derived tumors: | | | | | |
|----------------------------|--------------------------------|------------|---------------------------|--|--|
| MTB ID | Organ | Derived By | Tumor Frequency Range (%) | More Info | |
| MTB:10130 | Lung - Alveolus adenocarcinoma | Kidney | sporadic | Show Derived Tumor Details | |
| MTB:10131 | Lung - Alveolus adenocarcinoma | Lymph node | sporadic | Show Derived Tumor Details | |

| Tumor Genetics | | | |
|--|--------------|--|--------------|
| Gene/Locus | Mouse Chrom. | Genotype or Genetic Change | Reference ID |
| Kras2 Kirsten rat sarcoma oncogene 2, expressed (mouse) | 6 | Targeted mutation / Normal (knockout) Kras2^{tm2.1Tyi-sm} / Kras2⁺ | J:68981 |

| Tumor Frequency | | | | |
|-----------------------------------|-------------------------|------------------|--|--------------|
| Status (reproductive & infection) | Tumor Frequency (%) | Age at Onset | Notes | Reference ID |
| | | Age at Detection | | |
| reproductive status not specified | 100 (15 out of 15 mice) | 1 week | The mean age of death/sacrifice was 300 days. All animals were found to have an extensive tumor burden (average 40 tumors per mouse at age 10 weeks). In older mice infrequent metastases were observed to thoracic lymph nodes, the kidney and other visceral organs. | J:68981 |
| | | 300 days | | |
| reproductive status not specified | 0 | 1 day | Lungs from one day-old pups did not contain any tumors or pre-neoplastic lesions. | J:68981 |

Strain Record Details

Strain Details

http://tumor.informatics.jax.org/FMPro?-db=Source&-lay=web&-form. Google

Strain Name: B6;129S2-Kras2^{tm2Tyj}/+

Sex: sex not specified

Strain Type: targeted mutation (knockout)

Notes: Mice heterozygous for a targeted mutation of Kras2 (K-ras), also called "K-ras2^{LA1}". Spontaneous somatic recombination leads to the expression of an activated oncogenic Kras2 protein. The genetic background was a mix of C57BL/6 and 129S2/SvPas.

Links to Other Databases: Information about other strains carrying the same mutant allele(s):

- [Mouse Models of Human Cancers Consortium \(MMHCC\) Repository](#)

| Strain Genetics | | | |
|--|--------------|---|--------------|
| Gene/Locus | Mouse Chrom. | Germline Genotype | Reference ID |
| Kras2 Kirsten rat sarcoma oncogene 2, expressed (mouse) | 6 | Targeted mutation / Normal (knockout) Kras2^{tm2Tyj} / Kras2⁺ | J:68981 |

| Tumors | | | | | | |
|-----------|---|-------------------------------------|--------------------|---------------------------|------------------|--|
| MTB ID | Tumor Name | Organ/ Tissue Affected | Treatment Agents | Tumor Frequency Range (%) | Pathology Images | Additional Information |
| | | | | | | List all tumors for these mice |
| MTB:10135 | Intestine - Large Intestine - Colon carcinoma | Intestine - Large Intestine - Colon | None (Spontaneous) | 0 | | Show Record Details |
| MTB:10136 | Intestine - Large Intestine - Colon foci | Intestine - Large Intestine - Colon | None (Spontaneous) | 100 | | Show Record Details |
| MTB:10133 | Leukocyte - Lymphocyte lymphoma | Thymus | None (Spontaneous) | 20 | | Show Record Details |
| MTB:10130 | Lung - Alveolus adenocarcinoma | Kidney | None (Spontaneous) | sporadic | | Show Record Details |
| MTB:10129 | Lung - Alveolus adenocarcinoma | Lung - Alveolus | None (Spontaneous) | 0-100 | | Show Record Details |
| MTB:10131 | Lung - Alveolus adenocarcinoma | Lymph node | None (Spontaneous) | sporadic | | Show Record Details |
| MTB:10134 | Pancreas carcinoma | Pancreas | None (Spontaneous) | 0 | | Show Record Details |
| MTB:10132 | Skin papilloma | Skin | None (Spontaneous) | 27 | | Show Record Details |

Pathology Image Search

Pathology Image Search Form

http://tumor.informatics.jax.org/FMPro?-db=Image&-format=patholog Google

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Pathology Image Search Form

Search by Organ/Tissue of Origin:

Organ/Tissue of Origin:

- Leukocyte - Lymphoblast
- Leukocyte - Lymphocyte
- Liver
- Lung
- Lymph node
- Mammary gland
- Mesodermal cell/mesoblast
- Muscle
- Muscle - Striated
- Muscle - Striated - Skeletal

OR

Search by Probe (Antibody):

Probe (Antibody):

- ANY
- anti-15-lipoxygenase form 2 (LX 25)
- anti-alpha sarcomeric actin (A2172)
- anti-alpha smooth muscle actin (A2547)
- anti-alpha-catenin (AB19021)
- anti-alpha-catenin (C2081)
- anti-beta catenin (AB19022)

NEW New feature: Antibody summary ([html](#)) ([Excel](#)) **NEW**

Note: For more complex searches use the [Tumor Search](#) form and click the "Yes" radio button next to "Do you want only those database records that have histopathology images?" to search for only those tumor records that have associated histopathology images in the database.

[Citing MTB](#)
MTB is supported by grant [CA89713](#) from the National Cancer Institute ([NCI](#)).
[Warranty Disclaimer & Copyright Notice](#).
Send questions and comments to [User Support](#).

Pathology Images

Pathology Image Search Results

http://tumor.informatics.jax.org/FMPro?-db=InstancePathologyLink&-l Google

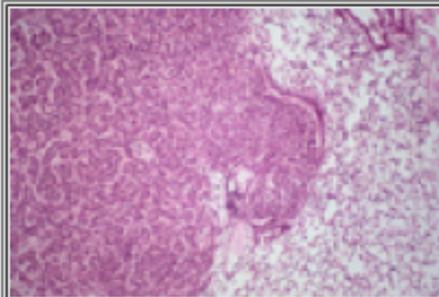
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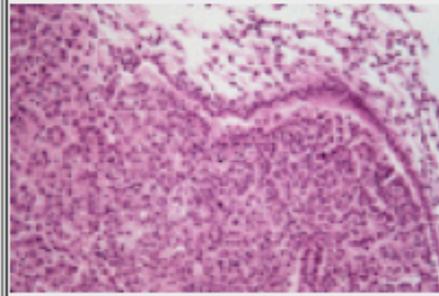


Pathology Image Search Results

Displaying records 1 through 1 of 1 pathology reports found.



Method: **H&E**
[View Large Image](#)



Method: **H&E**
[View Large Image](#)

MTB:12961

Organ/Tissue of Origin: **Lung - Bronchus**
Tumor Classification: **adenocarcinoma**
Organ/Tissue Affected: Lung
Treatment: None (Spontaneous)

Strain Name: **BALB/cJ**
Sex: **male**

[\(View the details of this pathology report\)](#)

Image

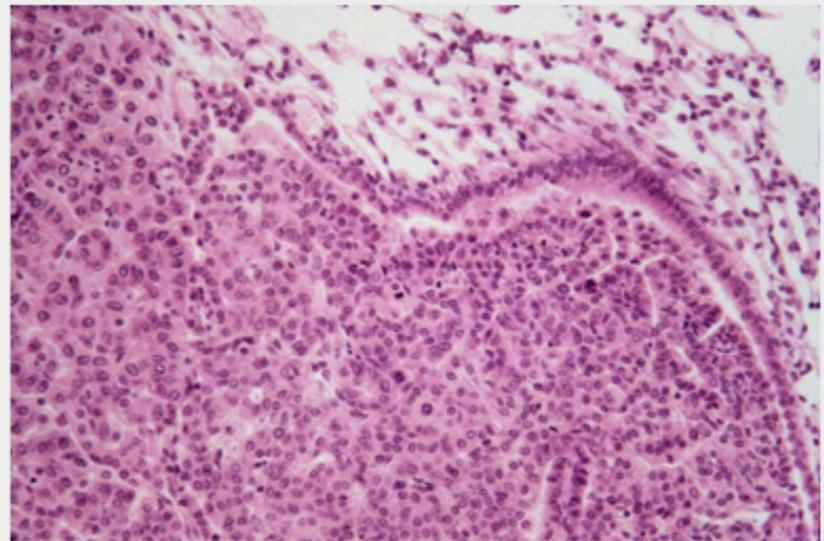


Image Caption: This higher magnification shows an area of continuity between the epithelial lining of a bronchus and the neoplasm. The neoplasm is made of tubules with an inconspicuous lumen. Neoplastic cells are medium-sized, with indistinct cell borders and a moderate amount of acidophilic cytoplasm. Their nucleus is central, round, and medium-sized. Anisokaryosis and anisocytosis are mild. There is a mild diffuse lymphocytic infiltration throughout the neoplasm.

Pathologist: [Igor Mikaelian](#)
Organism: mouse
Method: H&E
Image ID: 399
Source of Image: [Igor Mikaelian](#)

[Close Window](#)

MTB Home Page

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Quick Organ/Tissue Search

ANY
Adipose tissue
Adipose tissue - Brown
Adipose tissue - White
Adrenal gland
Adrenal gland - Cortex
Adrenal gland - Medulla
Adrenal gland - Subcapsular cell
Ampullary gland
Blood vessel
Blood vessel - Pericyte
Bone
Bone marrow
Bone - N

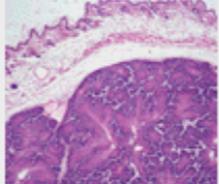
[Retrieve](#) [Reset Form](#)

 [Tumor Frequency Grid](#)
[\(Spontaneous tumors in inbred mice\)](#)

[JAX Path](#)
electronic submission of pathology data

Search for a tumor record by MTB accession ID: (Example: MTB:80)

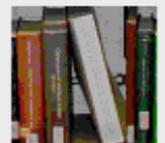
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NEW New feature: Antibody summary ([html](#)) ([Excel](#)) **NEW**

 [Reference Search](#)

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Challenges

- Integration with other resources
- Rate of data publication vs. rate of data acquisition
- Visibility within the cancer research community
- Storage and display of comparative pathology data

Future projects

- Move the whole database to Sybase
- Implement Zoomify for image display
- Automate Tumor Frequency Grid and make it interactive
- Develop other visualization tools

MTB Database

<http://tumor.informatics.jax.org>

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Carol J. Bult

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Theresa Allio

Matthew J. Vincent

Igor Mikaelian

John P. Sundberg