

Human Cancer Models Initiative (HCMI): A Community Resource of Next-generation Cancer Models

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There is a need for improved cancer models

- Traditional cell lines lack ***associated clinical data***, matched ***normal tissue***, and do not recapitulate the ***microenvironment*** of cancer
- Results in animal models do not always lead to ***breakthroughs in human studies***
- It is unethical or impossible to perform many experiments in humans

The Human Cancer Models Initiative (HCMI)

- HCMI is an international consortium founded by ***NCI, Cancer Research UK, Wellcome Sanger Institute***, and the foundation ***Hubrecht Organoid Technology***
- Over ***800 patient-derived Next-Generation Cancer Models (NGCMs)*** have been generated
- Models have been generated from many cancer types, including rare and pediatric cancers
- ***337 models*** are available to the research community at ATCC, with more on the way

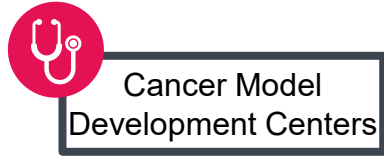
Outline (1)

- **How are models generated and quality controlled?**
- **What models are available?**
- **HCMI webpages & resources**

Outline (2)

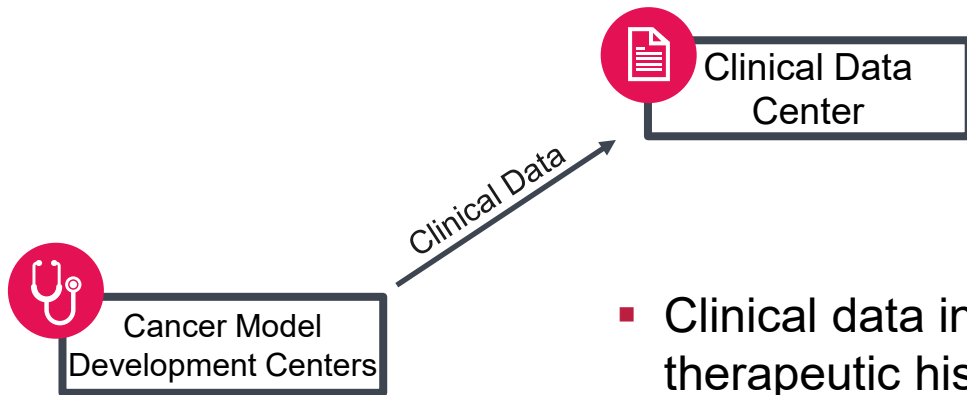
- **How are models generated and quality controlled?**
- What models are available?
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Cancer Model Development Centers (CMDCCs) generate models



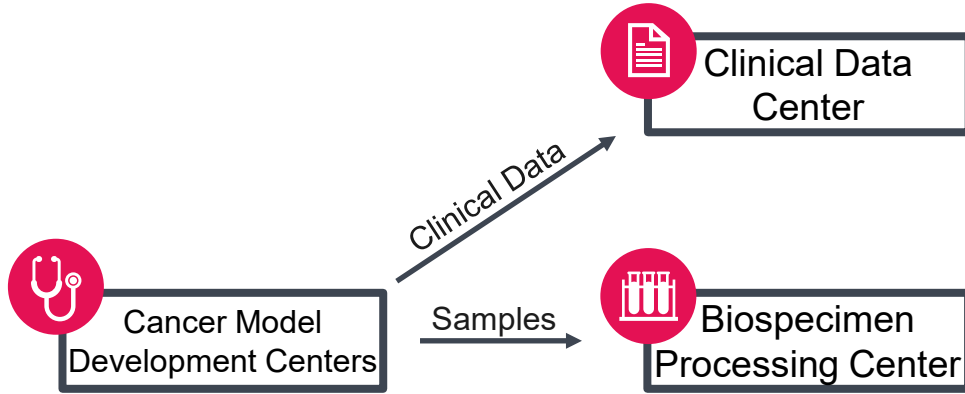
- CMDCCs include the Broad Institute, Cold Spring Harbor Laboratory, Stanford University, and Weill Cornell Medical College

The Clinical Data Center (CDC) harmonizes & quality controls clinical data

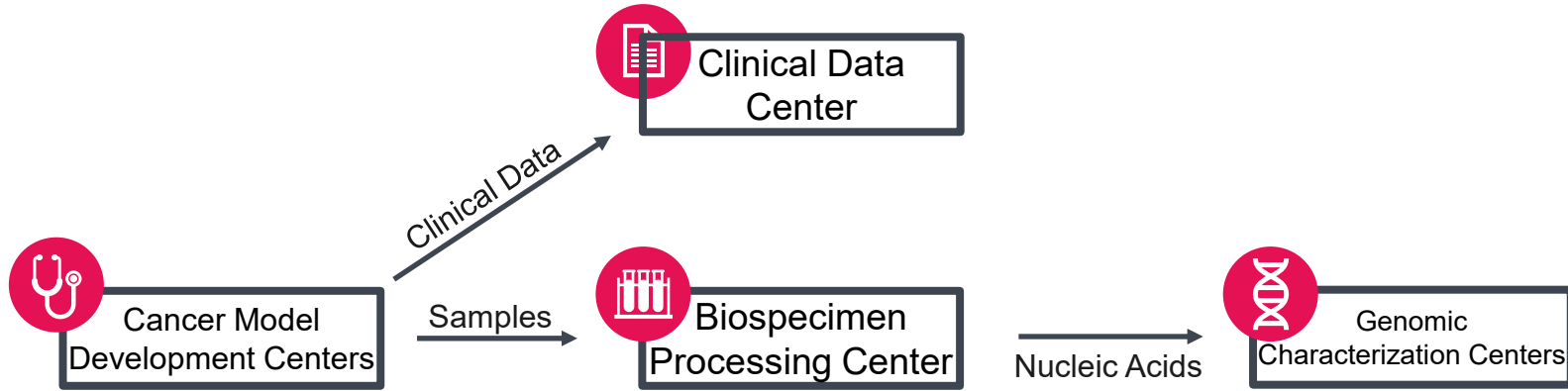


- Clinical data includes demographic information, therapeutic history, histological subtype, etc.

The Biospecimen Processing Center (BPC) processes patient tissue

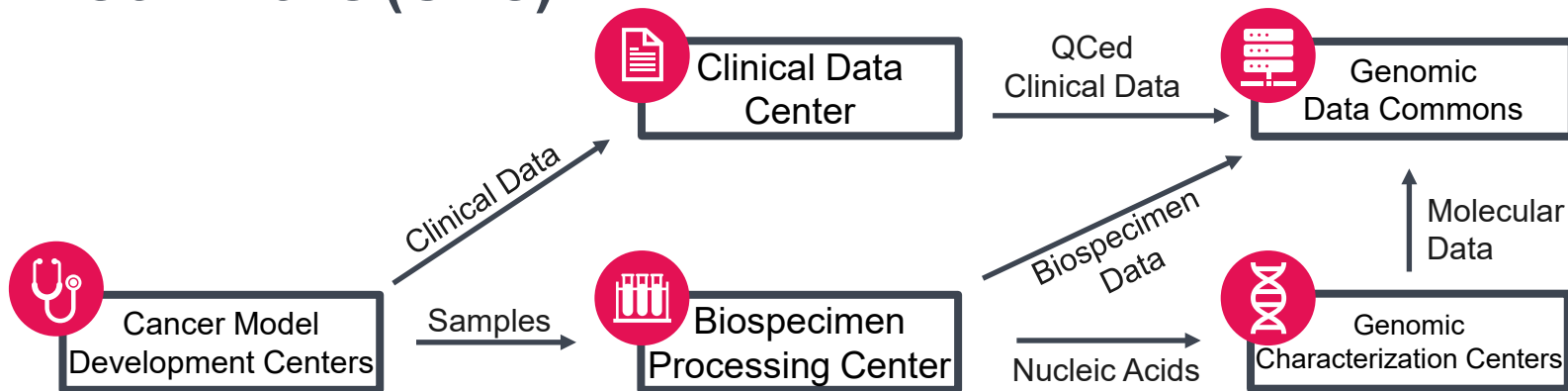


Sequencing and other molecular characterization is performed at Genomic Characterization Centers (GCCs)



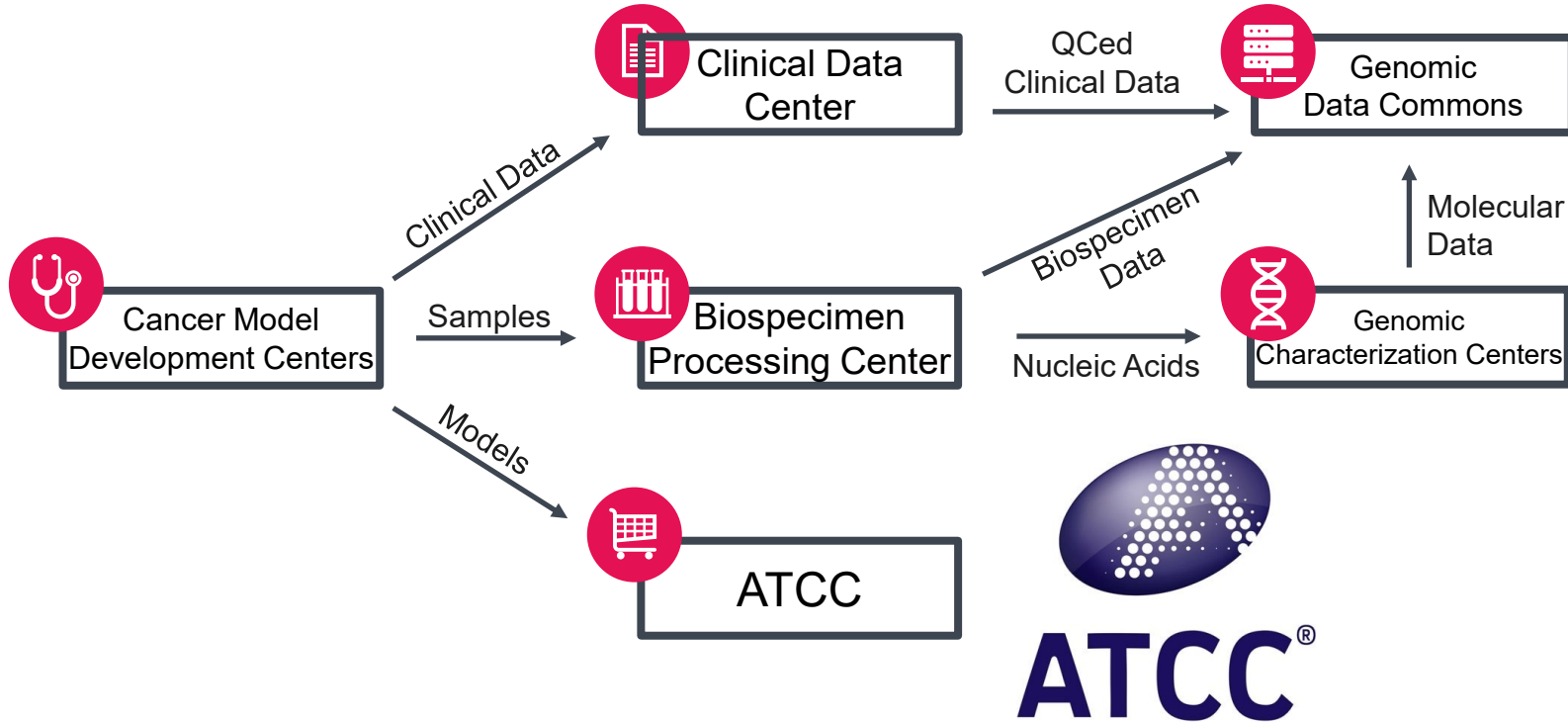
- 150x WXS and 15x WGS performed on models, tumor & normal tissue
- 120 million read RNA-seq performed on all models & tumors, and DNA methylation arrays on a subset

Harmonized & QCed data are sent to the Genomic Data Commons (GDC)

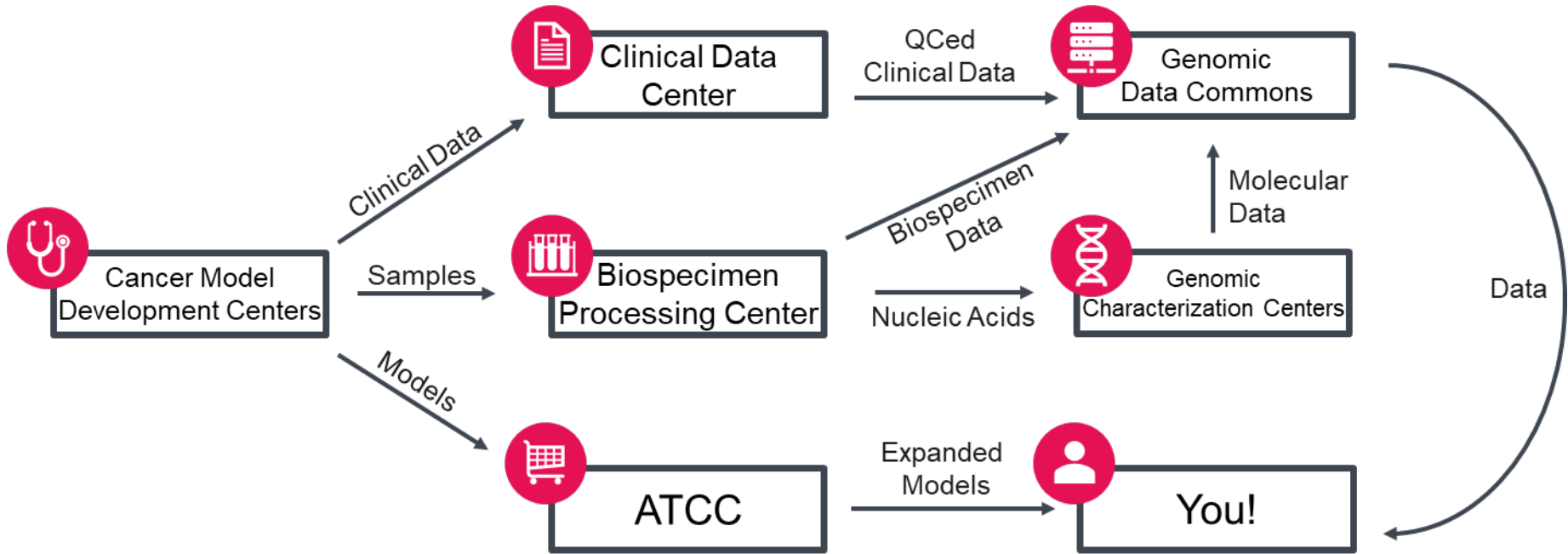


NATIONAL CANCER INSTITUTE
Genomic Data Commons

Models are sent to the ATCC for expansion & distribution



Data (from GDC) and models (from ATCC) are available to the research community



- Proteomics data coming soon for some models

Outline (3)

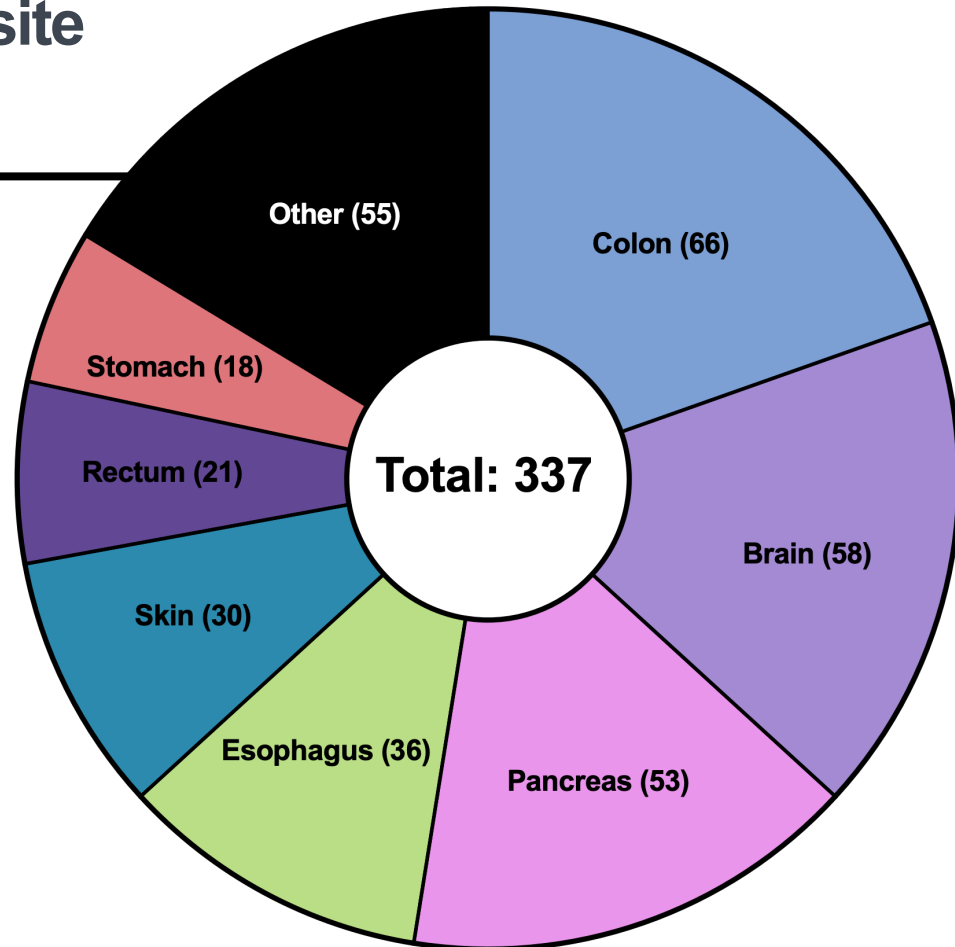
- How are models generated and quality controlled?
- **What models are available?**
- HCMI webpages & resources

HCMI models by the numbers

- **337 models** are currently available from ATCC, with many more in the production queue
- Data from **664 models** are available at the GDC
- Available models from **32 primary sites**

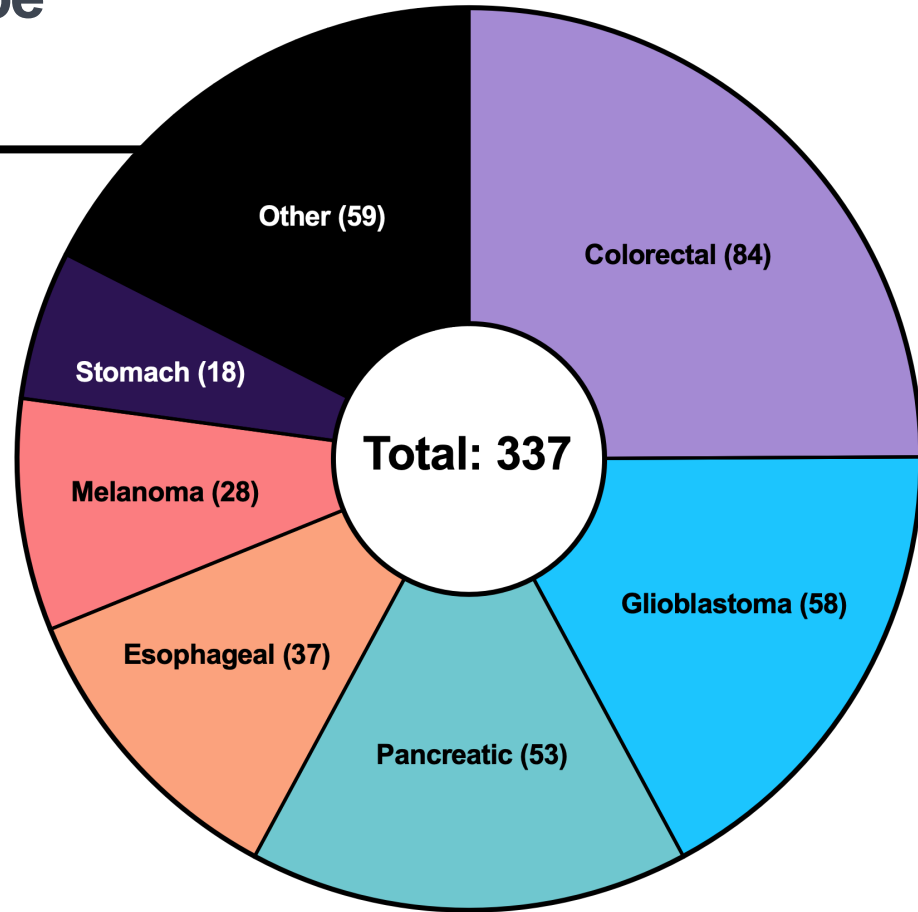
Available models by primary site

- Lung/Bronchus
- Ampulla of Vater
- Connective tissue
- Bone
- Endometrium
- Small intestine
- Extrahepatic bile duct
- Kidney
- Ovary
- Rectosigmoid junction
- Uterus
- Abdomen
- Gallbladder
- Intrahepatic bile duct
- Mouth
- Nasal cavity
- Oral cavity
- Thyroid gland
- Tongue

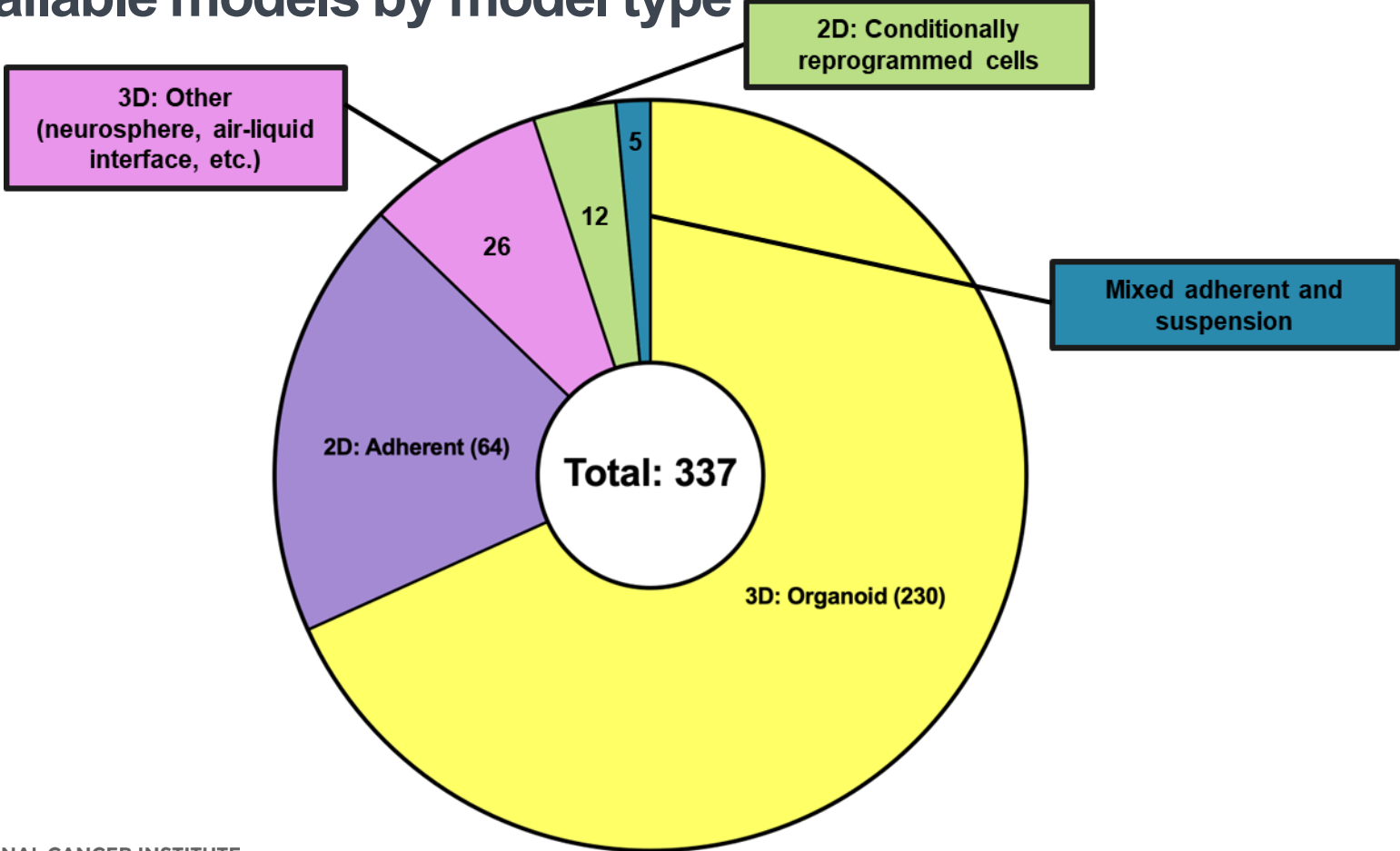


Available models by cancer type

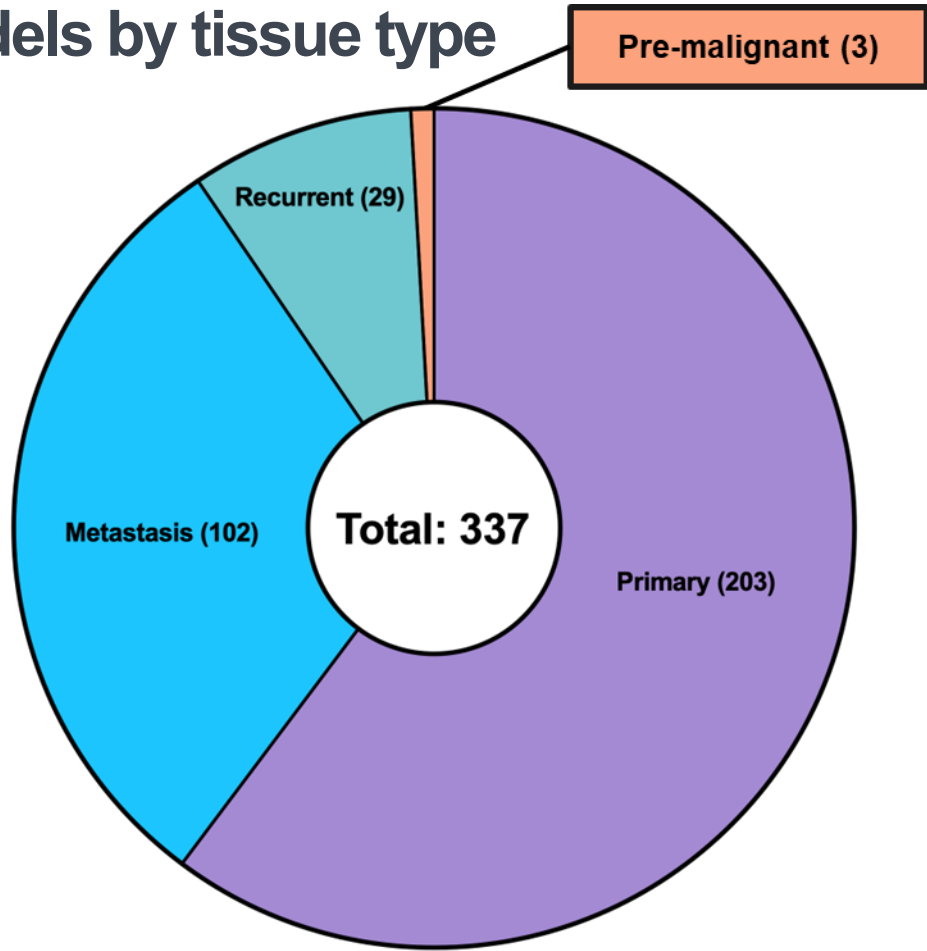
- Breast
- Endometrial
- Lung
- Ampulla of Vater
- Head & Neck
- Rhabdomyosarcoma
- Ewing's sarcoma
- Ovarian
- Wilms tumor
- Intrahepatic bile duct
- Osteosarcoma
- Others!



Available models by model type



Available models by tissue type



Outline (4)

- How are models generated and quality controlled?
- What models are available?
- **HCMI webpages & resources**

HCMI Searchable Catalog

<https://hcmi-searchable-catalog.nci.nih.gov>

Human Cancer Models Initiative
Searchable Catalog

Search By Model Name

Search By Altered Gene(s)

Search By Research Somatic Variant

Primary Site

- Colon 66
- Brain 58
- Pancreas 53
- Esophagus 36 24 More

Research Somatic Variant Type

- Missense Mutation 320
- Silent 320
- Nonsense Mutation 309
- Intron 291 13 More

Consequence

- Missense Variant 320
- Synonymous Variant 320
- Stop Gained 306
- Frameshift Variant 304 67 More

Model Type

- 3-D: Organoid 230
- 2-D: Adherent 64
- 3-D: Other (e.g. neurosphere, air-liquid interface, etc.) 26
- 2-D: Conditionally reprogrammed cells 12
- Mixed adherent and suspension 5

Use the filter panel on the left to customize your model search.

Models By Primary Site

28 Total

Has Multiple Models

2D Versus 3D Growth

Most Frequently Mutated Genes

Showing 1 - 20 of 337 models Include 323 unexpanded models COLUMNS EXPORT

<input type="checkbox"/>	Name	Primary Site	Clinical Tumor Diagnosis	Tissue Status	Age At Acquisition (Years)	Age At Diagnosis (Years)	Has Multiple Models	Expansion Status	# Mutated Genes	# Research Somatic Variants	# Clinical Variants	# Histo-Pathological Biomarkers
<input type="checkbox"/>	HCM-BROD-0648-C71	Brain	Glioblastoma	Recurrent	68	63	No	EXPANDED	5326	7110	0	3
<input type="checkbox"/>	HCM-BROD-0782-C71	Brain	Glioblastoma	Recurrent	55	51	No	EXPANDED	4295	5422	0	2
<input type="checkbox"/>	HCM-BROD-0227-C43	Skin	Melanoma	Metastasis	40	40	No	EXPANDED	3075	4187	0	0
<input type="checkbox"/>	HCM-SANG-0288-C18	Colon	Colorectal cancer	Primary	75		No	EXPANDED	3228	3908	0	0
<input type="checkbox"/>	HCM-BROD-0569-C43	Skin	Melanoma	Metastasis	79	78	No	EXPANDED	2886	3802	0	1
<input type="checkbox"/>	HCM-BROD-0594-C43	Skin	Melanoma	Metastasis	78	75	No	EXPANDED	2690	3555	0	0
<input type="checkbox"/>	HCM-CSHL-0428-C18	Colon	Colorectal cancer	Primary	73	72	No	EXPANDED	2701	3183	0	0
<input type="checkbox"/>	HCM-SANG-0273-C18	Colon	Colorectal cancer	Primary	78		No	EXPANDED	2597	2991	0	0
<input type="checkbox"/>	HCM-BROD-0027-C34	Bronchus and lung	Lung cancer	Metastasis	66	65	No	EXPANDED	2313	2868	0	0
<input type="checkbox"/>	HCM-CSHL-0378-C18	Colon	Colorectal cancer	Recurrent	49	49	No	EXPANDED	2479	2849	1	6
<input type="checkbox"/>	HCM-CSHL-0459-C17	Small intestine	Rare cancers	Primary	57	57	No	EXPANDED	2426	2793	0	5
<input type="checkbox"/>	HCM-CSHL-0240-C18	Colon	Colorectal cancer	Primary	81	81	No	EXPANDED	2371	2711	0	5
<input type="checkbox"/>	HCM-BROD-0223-C43	Skin	Melanoma	Metastasis	74	73	No	EXPANDED	2187	2679	0	0
<input type="checkbox"/>	HCM-CSHL-0242-C18	Colon	Colorectal cancer	Primary	72	72	No	EXPANDED	2367	2662	0	5
<input type="checkbox"/>	HCM-SANG-0282-C18	Colon	Colorectal cancer	Primary	85		No	EXPANDED	2313	2636	0	0
<input type="checkbox"/>	HCM-BROD-0724-C43	Skin	Melanoma	Metastasis	74	74	No	EXPANDED	2013	2530	1	0
<input type="checkbox"/>	HCM-CSHL-0606-C71	Small intestine	Rare cancers	Metastasis	71	71	No	EXPANDED	2143	2383	0	3
<input type="checkbox"/>	HCM-BROD-0106-C71	Brain	Glioblastoma	Recurrent	56	52	No	EXPANDED	2122	2333	0	3
<input type="checkbox"/>	HCM-WCMC-0494-C16	Stomach	Stomach cancer	Primary	64	64	No	EXPANDED	1883	2107	0	2
<input type="checkbox"/>	HCM-SANG-0278-C18	Colon	Colorectal cancer	Primary	78		No	EXPANDED	1768	1976	0	0

Showing 20 rows Updated: January 14, 2026 Page 1

Clinical and molecular data are integrated into search

The screenshot shows a search interface with several filter sections, each with a search input field and a dropdown menu. The sections are:

- Search By Model Name**: Input field with placeholder text "e.g. HCM-BROD-0051-C64, ...".
- Search By Altered Gene(s)**: Input field with placeholder text "e.g. BRAF, EWSR, ...".
- Search By Research Somatic Variant**: Input field with placeholder text "e.g. BRAF V600E, IDH1 R132H, ...".
- Primary Site**: A list of radio buttons with corresponding counts:
 - Colon: 66
 - Brain: 58
 - Pancreas: 53
 - Esophagus: 36A red plus icon and "24 More" link are visible below the list.
- Research Somatic Variant Type**: A list of radio buttons with corresponding counts:
 - Missense Mutation: 320
 - Silent: 320
 - Nonsense Mutation: 309
 - Intron: 291A red plus icon and "13 More" link are visible below the list.

- You can filter by:
 - Primary site
 - Cancer type
 - Molecular data availability
 - Altered genes
 - Therapy history
 - More!

Model pages contain more details

Model: **HCM-CSHL-0806-C54** EXPANDED BACK TO SEARCH ADD MODEL TO MY LIST VIEW LIST

< Previous Model 19 of 230 Next >

MODEL DETAILS

Model Type	3-D: Organoid
Split Ratio	N/A
Time to Split	N/A
Doubling Time	N/A
Tissue Status	Primary

MULTIPLE MODELS FROM THIS PATIENT (0)

There are no other models from this patient.

AVAILABLE MOLECULAR CHARACTERIZATIONS (10)

	Model	Tumor	Normal
WGS	✓	✓	✓
WXS	✓	✓	✓
RNA-seq	✓	✓	✗
DNA Methylation	✓	✓	✗

PATIENT DETAILS

Gender	Female
Race	Black or African American
Age At Diagnosis (Years)	74
Age At Acquisition (Years)	74
Disease Status	No evidence of disease
Vital Status	Alive
Neoadjuvant Therapy	No
Therapy	• Surgery • Cytotoxic chemotherapy • Radiation therapy
Chemotherapeutic Drug List Available	Yes
Clinical Tumor Diagnosis	Endometrial cancer
Histological Subtype	Mixed cell carcinoma
Primary Site	Endometrium
Acquisition Site	Endometrium
Tissue Status	Primary
TNM Stage	T1bN1aMX
Clinical Stage Grouping	N/A
Histological Grade	High grade

MODEL IMAGES (2)

© ATCC PDM-589™
Scale-bar length: 1000 μm | Magnification: 4 x

REPOSITORY STATUS

Date Updated	May 03, 2024
Date Of Availability	August 31, 2023
Licensing Required For Commercial Use	Yes
Date Created	August 24, 2023

EXTERNAL RESOURCES

SEQUENCING FILES
CASE METADATA
MASKED SOMATIC MAF
VISIT PDM-589 TO PURCHASE

Model info & available molecular data

MODEL DETAILS

Model Type	3-D: Organoid
Split Ratio	N/A
Time to Split	N/A
Doubling Time	N/A
Tissue Status	Primary

MULTIPLE MODELS FROM THIS PATIENT (0)

There are no other models from this patient.

AVAILABLE MOLECULAR CHARACTERIZATIONS (10)

	Model	Tumor	Normal
WGS	✓	✓	✓
WXS	✓	✓	✓
RNA-seq	✓	✓	✗
DNA Methylation	✓	✓	✗

Patient demographic & clinical information

PATIENT DETAILS	
Gender	Female
Race	Black or African American
Age At Diagnosis (Years)	74
Age At Acquisition (Years)	74
Disease Status	No evidence of disease
Vital Status	Alive
Neoadjuvant Therapy	No
Therapy	<ul style="list-style-type: none">• Surgery• Cytotoxic chemotherapy• Radiation therapy
Chemotherapeutic Drug List Available	Yes
Clinical Tumor Diagnosis	Endometrial cancer
Histological Subtype	Mixed cell carcinoma
Primary Site	Endometrium
Acquisition Site	Endometrium
Tissue Status	Primary
TNM Stage	T1bN1aMX
Clinical Stage Grouping	N/A
Histological Grade	High grade

Somatic/clinical variants and histopathological markers are imported from GDC

VARIANTS

Research Somatic Variants Research Somatic Variants are imported from GDC and are identified from filtered, open-access MAFs. Controlled-access data at GDC requires dbGaP approval; see [GDC](#) for details.

Clinical Variants

Histopathological Biomarkers

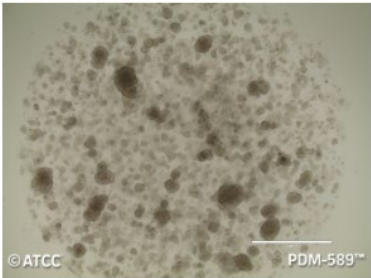
Showing 1 - 20 of 7110 Variants

Variant	Gene	AA Change	Transcript	Consequence
chrY:g.14840490C>T	NLGN4Y	S560F	ENST00000339174	Missense Variant
chrY:g.12915656G>A	DDX3Y	R349K	ENST00000336079	Missense Variant
chrY:g.12912807G>A	DDX3Y	G121E	ENST00000336079	Missense Variant
chrY:g.9530466G>A	TSPY10	G302E	ENST00000428845	Missense Variant;splice Region Variant
chrY:g.5099030C>T	PCDH11Y	L484=	ENST00000400457	Synonymous Variant
chrX:g.155511710G>A	TMLHE	R241W	ENST00000334398	Missense Variant
chrX:g.154966610C>T	F8	E363K	ENST00000360256	Missense Variant
chrX:g.154860567C>T	F8	K2255=	ENST00000360256	Synonymous Variant
chrX:g.154562878G>A	IKBK3	E279=	ENST00000594239	Synonymous Variant
chrX:g.154506841G>A	FAM3A	G221=	ENST00000359889	Synonymous Variant
chrX:g.154468122C>T	PLXNA3	N1287=	ENST00000369682	Synonymous Variant
chrX:g.154350193G>A	FLNA	R2391C	ENST00000369850	Missense Variant
chrX:g.154348993G>A	FLNA	P2600=	ENST00000369850	Synonymous Variant
chrX:g.153956950C>T	HCFC1	A822T	ENST00000310441	Missense Variant
chrX:g.153953056G>A	HCFC1		ENST00000310441	Intron Variant
chrX:g.153950975G>A	HCFC1	D1847=	ENST00000310441	Synonymous Variant
chrX:g.153905766C>T	AVPB2	A87V	ENST00000337474	Missense Variant
chrX:g.153868900C>T	L1CAM	Q440=	ENST00000370060	Synonymous Variant
chrX:g.153866791C>T	L1CAM	W763*	ENST00000370060	Stop Gained
chrX:g.153782827G>A	SRPK3	K177=	ENST00000370101	Synonymous Variant

- Full genomic data available at GDC via dbGaP

Images of each model and links to external pages

MODEL IMAGES (2)



© ATCC PDM-589™

Scale-bar length: 1000 μ m | Magnification: 4 x

REPOSITORY STATUS

Date Updated	May 03, 2024
Date Of Availability	August 31, 2023
Licensing Required For Commercial Use	Yes
Date Created	August 24, 2023

EXTERNAL RESOURCES

- [SEQUENCING FILES](#)
- [CASE METADATA](#)
- [MASKED SOMATIC MAF](#)
- [VISIT PDM-589 TO PURCHASE](#)

GDC Data Portal: HCMI Project Page

<https://portal.gdc.cancer.gov/projects/HCMI-CMDC>

NATIONAL CANCER INSTITUTE
GDC Data Portal

Video Guides | Send Feedback | Browse Annotations | Manage Sets | Cart | Login | GDC Apps

Analysis Center | Projects | Cohort Builder | Repository

Obtaining Access to Controlled Data

PROJECT • HCMI-CMDC

Save New Cohort | Biospecimen | Clinical | Manifest

TOTAL OF 805 CASES | 43,662 FILES | 1,621 ANNOTATIONS

SUMMARY

The project has controlled access data which requires dbGaP Access. See instructions for [Obtaining Access to Controlled Data](#).

Project ID	HCMI-CMDC	Project Name	NCI Cancer Model Development for the Human Cancer Model Initiative
dbGaP Study Accession	phs001486	Program	HCMI

CASES AND FILE COUNTS BY DATA CATEGORY

Data Category	Cases (n=805)	Files (n=43,662)
Biospecimen	530 (65.84%)	1,123 (2.57%)
Clinical	805 (100.00%)	805 (1.84%)
Copy Number Variation	590 (73.29%)	2,687 (6.15%)
DNA Methylation	703 (87.33%)	3,066 (7.02%)
Sequencing Reads	805 (100.00%)	7,936 (18.18%)
Simple Nucleotide Variation	606 (75.28%)	17,244 (39.49%)
Somatic Structural Variation	590 (73.29%)	2,237 (5.12%)
Structural Variation	781 (97.02%)	4,614 (10.57%)
Transcriptome Profiling	783 (97.27%)	3,950 (9.05%)

CASES AND FILE COUNTS BY EXPERIMENTAL STRATEGY

Experimental Strategy	Cases (n=805)	Files (n=43,662)
Methylation Array	703 (87.33%)	3,066 (7.02%)
miRNA-Seq	520 (64.60%)	2,466 (5.65%)
RNA-Seq	781 (97.02%)	10,375 (23.76%)
Tissue Slide	382 (47.45%)	810 (1.86%)
WGS	804 (99.88%)	11,357 (26.01%)
WXS	721 (89.57%)	14,470 (33.14%)

- Access controlled-access genomic data via dbGaP

ATCC Storefront

<https://www.atcc.org/cell-products/collections-and-projects/human-cancer-models-initiative>



Explore HCMI cancer models Show per page: 24

PRODUCTS RESOURCES

Results 1-24 of 341

Search

Refine by

- Product category**
 - Human cells 334
 - Media 7
- Product type**
 - Cell model 334
 - Organoid 233
- Product application**
 - Cancer research 341

HCM-BROD-0925-C71
PDM-634 BSL 1

Product format: Frozen
Product type: Cell model
Organism: *Homo sapiens*, human
Tissue: Brain
Disease: Glioblastoma; Recurrent

[Quick View](#) Compare

Price: \$3,779.00 ea
Quantity [Add to Cart](#)
[Add to List](#)

HCM-BROD-0689-C71
PDM-405 BSL 1

Product format: Frozen
Product type: Cell model
Organism: *Homo sapiens*, human
Tissue: Brain
Disease: Glioblastoma; Recurrent

[Quick View](#) Compare

Price: \$3,779.00 ea
Quantity [Add to Cart](#)
[Add to List](#)

Model store page includes protocols, safety data sheet, etc.

Home > Cell Products > Human Cells > PDM-634

HCM-BROD-0925-C71

PDM-634™

A patient-derived next-generation cancer model generated by the Human Cancer Models Initiative (HCMI). HCM-BROD-0925-C71 (ATCC No. PDM-634) was isolated from recurrent glioblastoma of brain tissue. This tumor-derived model can be used in basic research and pharmacological screening applications. Data for the parental tumor and the tumor-derived organoid models are available at the GDC. Additional molecular characterizations may be available at the GDC. Additional controlled data may be available via dbGaP.

Product category	Human cells
Product type	Cell model
Organism	<i>Homo sapiens</i> , human
Morphology	neuronal
Tissue	Brain
Disease	Glioblastoma; Recurrent
Applications	3D cell culture Cancer research Neuroscience
Product format	Frozen
Storage conditions	Vapor phase of liquid nitrogen

Buy Now

Price: **\$3,779.00 ea**

Discounts may be available for our fellow nonprofit organizations. [Login](#) to see your price.

Generally ships within 1-3 business days

Quantity

[Add to cart](#)

[Add to list](#)

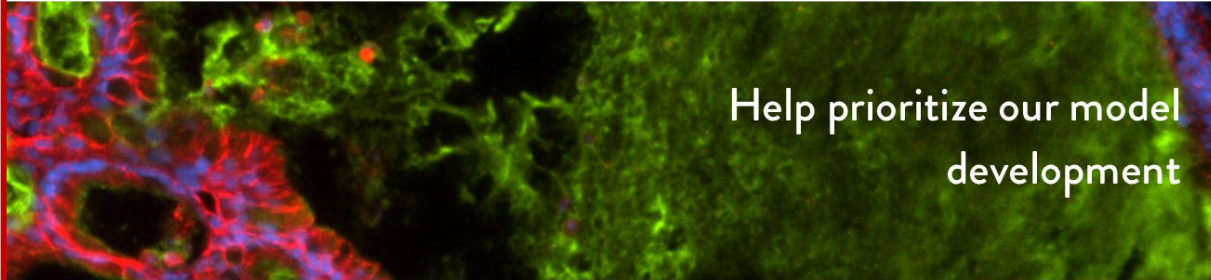
Documentation

- [Product sheet](#)
- [Certificate of analysis](#)
- [Safety data sheet](#)

ATCC Unmanufactured Models Page

<https://www.atcc.org/hcmi-input>

HCMI Unmanufactured Models



Help prioritize our model
development

ATCC has multiple HCMI models that have not been expanded or released to the ATCC catalog; these include organoids, neurospheres, and 2-D cell models. You can give insight into which models you think should be expanded and offered for purchase. Please note that submitting your input does not guarantee that the model will ultimately be developed.

Explore the unmanufactured models below by disease state and submit your opinion using the link to the form below. To view the available clinical and molecular information, please click on the model name to view the data on the HCMI searchable catalog.

[BLADDER >](#)

[BLOOD AND LYMPHATIC SYSTEM >](#)

[BRAIN >](#)

[BREAST >](#)

[CONNECTIVE/SOFT TISSUE >](#)

[ESOPHAGUS >](#)

[GYNECOLOGICAL TISSUE >](#)

[HEAD AND NECK >](#)

[KIDNEY >](#)

[LIVER >](#)

[LOWER DIGESTIVE TRACT >](#)

[LUNG >](#)

[PANCREAS >](#)

[SKIN >](#)

[STOMACH >](#)

[THYROID >](#)

ATCC Contacts



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HCMI Presentations at AACR

- ***Patient-derived pediatric glioblastoma models provide key insights into IDH1-driven drug resistance***
 - Carolina Lucchesi
 - Section 30, Board 7, #6171

- ***Transcriptomic and therapeutic insights from patient-derived colorectal cancer organoids***
 - Carolina Lucchesi
 - Section 1, Board 24, #5457

- ***Next-generation models to advance pediatric solid cancer treatments***
 - Rachana Agarwal
 - Section 30, Board 2, #6166

Coming soon in *Nature...*

A Compendium of Cancer Organoid Models for Diverse Cancer Types

Dina ElHarouni, Mushriq Al-Jazrawe, Seongmin Choi, Merve Dede, Toshinori Hinoue, Sean A. Misek, Heeju Noh, Luca Zanella, Yuen-Yi Tseng, Hayley E. Francies, Dennis Plenker, Cindy W. Kyi, Julyann Perez-Mayoral, Megan J. Stine, Eva Tonsing-Carter, Rachana Agarwal, Jean Claude Zenklusen, James M. Clinton, Jennifer M. Shelton, Timothy R. Chu, William F. Hooper, Xavi Loinaz, Paula Keskula, Jordan A. Lee, Peyton C. Kuhlert, Bahar Tercan, Sylvia F. Boj, Alessandro Vasciaveo, Lorenzo Tomassoni, James M. Crawford, Shawna Walsh, Claire Sinai, Sonam Bhatia, Priya Sridevi, Hardik Patel, Maria Antonietta Cerone, The HCFI Network, Kyle Ellrott, Calvin J. Kuo, Olivier Elemento, Semir Beyaz, Vincenzo Corbo, David L. Spector, Rameen Beroukhim, Martin L. Ferguson, Andrew D. Cherniack, Peter W. Laird, Nicolas Robine, Andrew McPherson, Katherine A. Hoadley, Mathew J. Garnett, David A. Tuveson, Andrea Califano, Paul T. Spellman, Keith L. Ligon, Daniela S. Gerhard, Louis M. Staudt, Jesse S. Boehm

Thank You!



**NATIONAL
CANCER
INSTITUTE**

cancer.gov

cancer.gov/espanol