DCB and NCI Resources for Researchers

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Cancer Cell Biology Branch
Division of Cancer Biology

DCB Annual New Grantee Workshop
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DCB and NCI Resources for Researchers

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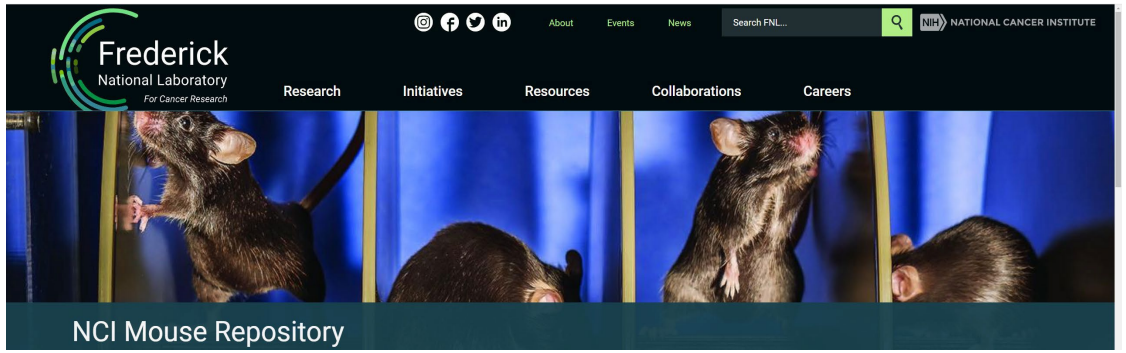
Experimental Resources

Animal Models, Cell Lines,
Reagents, Instrumentation, etc.

NCI Mouse Repository

Mouse Cancer Models (>500 currently)

- Mice are cryopreserved
- Request frozen embryos or sperm
- Researchers are encouraged to submit their cancer models to the NCI Mouse Repository for archiving and distribution



miRNA Embryonic Stem Cell Collection (>1,500 cell lines)

- ES cells overexpressing microRNA
- MicroRNAs are GFP labeled
- microRNA expression is inducible

https://frederick.cancer.gov/resources/repositories/nci-mouse-repository

MouseRepository@mail.nih.gov

Also of note: NIH-funded

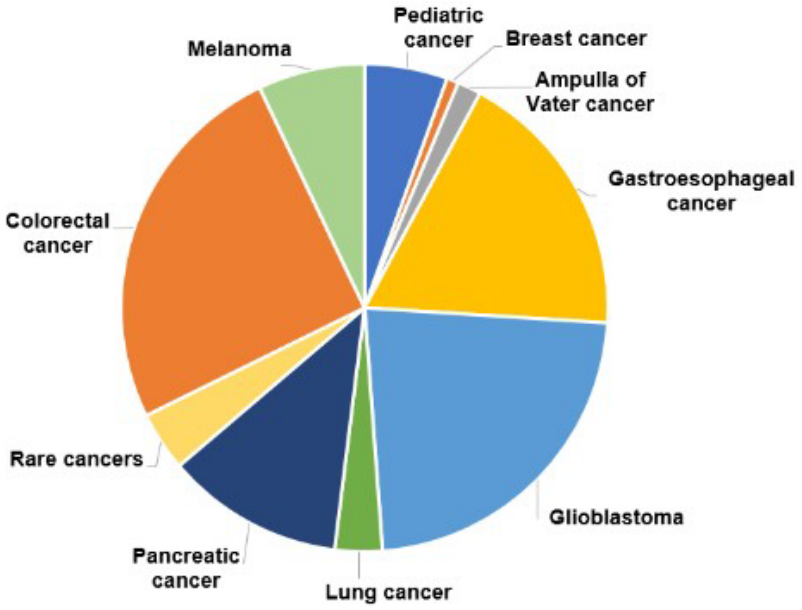
Mutant Mouse Resource & Research Centers
https://www.mmrrc.org

Rat Resource and Research Center (RRRC)
https://www.rrrc.us

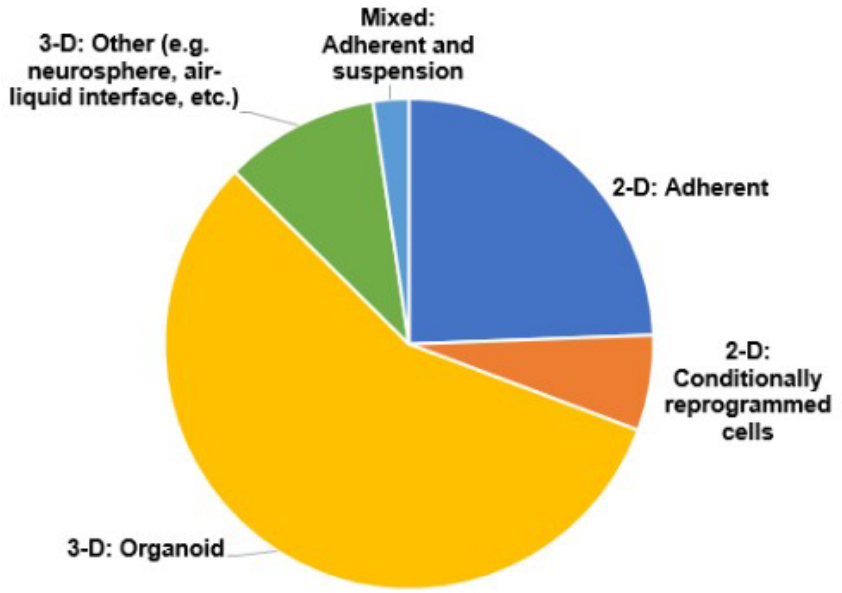
HCMI: Human Cancer Models Initiative

Patient-derived **cancer models** and **case-associated data** are available to researchers as a community resource.

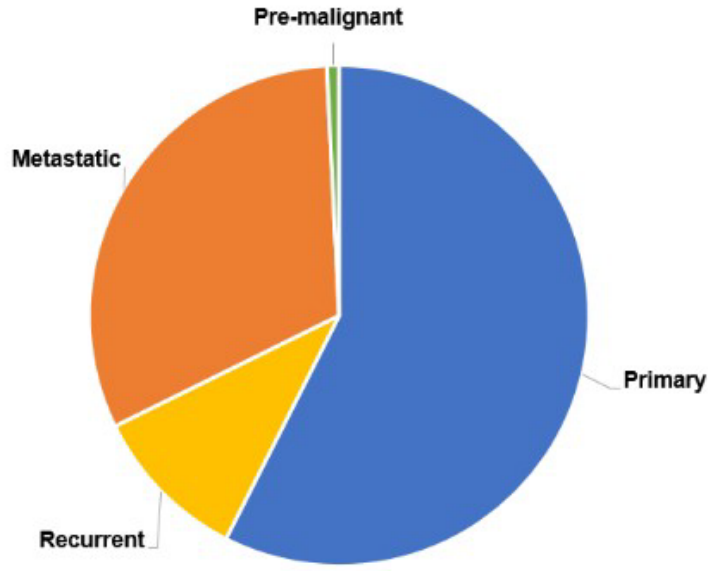
Available Cancer Types



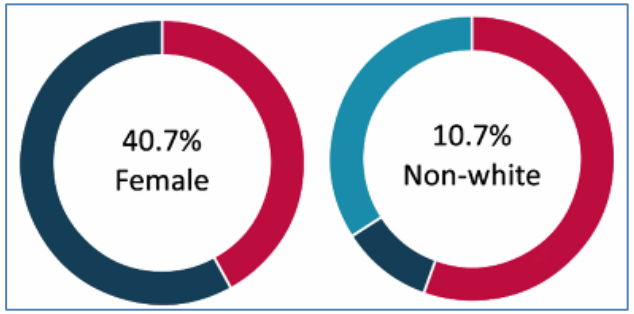
Available Model Types



Available Tissue Types



There are **300** models available through ATCC as of Dec 2023



NCI, Cancer Research UK, Wellcome Sanger Institute, Hubrecht Organoid Technology

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

Developmental Therapeutics Program (DTP)

- **Repository of Chemical Agents**

  Small Molecules and Isolated Natural Products: More than 200,000 synthetic compounds and pure natural products for non-clinical research purposes

- **Repository of Natural Products**

  170,000 extracts from samples of more than 70,000 plants and 10,000 marine organisms collected from more than 25 countries, more than 30,000 extracts of diverse bacteria and fungi

- **Repository of Biologicals** - Monoclonal Antibodies, Cytokines and Cytokine Standards
- **Repository of Tumors and Tumor Cell Lines** (e.g.,NCI-60): Transplantable *in vivo*-derived tumors and *in vitro*-established tumor cell lines from various species

https://dtp.cancer.gov/repositories/default.htm

ncidtpinfo@mail.nih.gov

NCI Cryo-Electron Microscopy Facility

- Facility to provide cryo-EM images collected on state-of- the-art instruments to academic users who can show that they have specimens of the required quality **ready for imaging at high resolution**

- Titan Krios microscope facility, where users can apply for a 48-hour imaging session of up to two different samples that will be loaded at one time together for each session

https://www.cancer.gov/research/resources/cryoem/access

Also of note:

NIH Common Fund Transformative High Resolution Cryo-Electron Microscopy Program

https://www.cryoemcenters.org of ***National CryoEM and CryoET Centers***

Access to **screening**, high resolution **data collection service,** and **cross-training**

Other Experimental Resources

NIH Tetramer Core

- Provides major histocompatibility complex (MHC) tetramers and related **reagents for the detection of T cell responses**; no charge

https://tetramer.yerkes.emory.edu/

BEI Resource Repository

- organisms and reagents for **microbiology and infectious diseases research** free of charge (bacterial cultures, viral isolates, reagents)

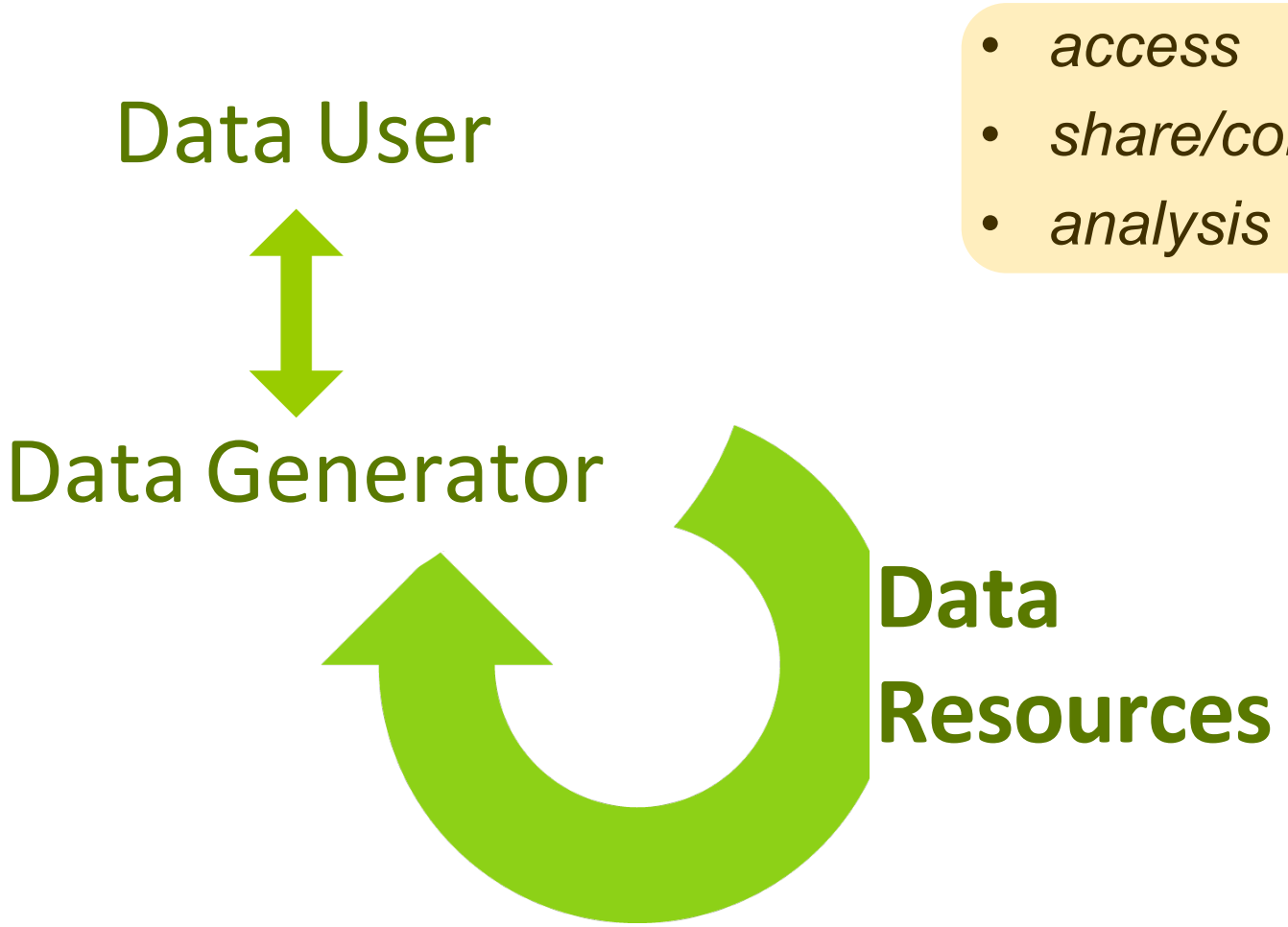
https://www.beiresources.org/Catalog.aspx

Biopharmaceutical Development Program

- offers resources for and expertise in the development of **investigational biological products** for cancer, rare diseases, AIDS, and infectious diseases applications.
- Proposed **collaborations** are reviewed and approved by the NCI using cooperative agreements.

https://frederick.cancer.gov/research/biopharmaceutical-development-program

DCB and NCI Resources for Researchers



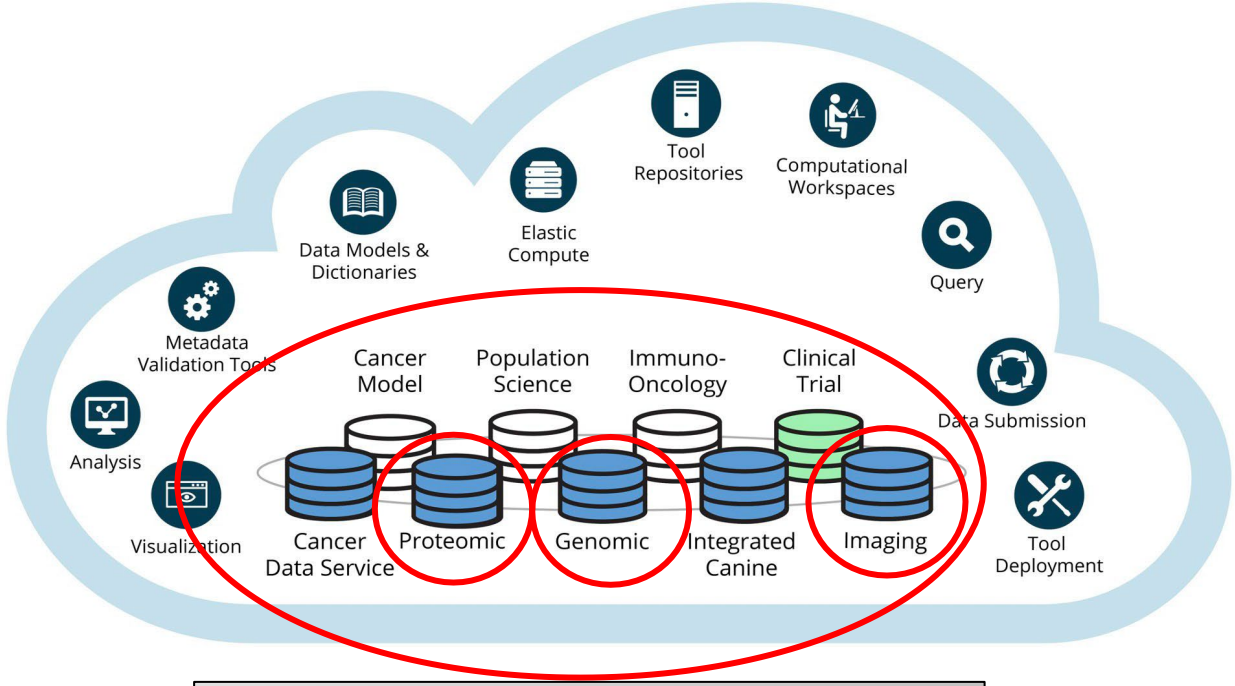
- *access*
- *share/compare*
- *analysis tools*

Surveillance, Epidemiology, and End Results Program (SEER)

- Provides information on **cancer statistics** monitoring U.S trends and support cancer research.
- Cancer data from registries covering nearly 50% of the U.S. population
- SEER is managed by the Surveillance Research Program (SRP) in the Division of Cancer Control and Population Science (DCCPS), NCI
- Data includes **cancer incidence and population data** associated by age, sex, race, year of diagnosis, and geographic areas
- With NCI, ACS and NAACCR, jointly issues the **Annual Report to the Nation on the Status of Cancer** https://seer.cancer.gov/report_to_nation/

https://seer.cancer.gov

Cancer Research Data Commons (CRDC)



https://datacommons.cancer.gov

- Data are stored in domain- or program-specific **Data Repositories.**
  - Genomic Data Commons (includes **TCGA** Data) https://portal.gdc.cancer.gov
  - Proteomic Data Commons (includes **CPTAC** Data) https://pdc.cancer.gov/pdc
  - Imaging Data Commons (includes **TCIA** Data) https://portal.imaging.datacommons.cancer.gov
- **NCI Cloud Resources** provide compute capability for the users of CRDC data
- Researchers can combine their own data and tools with CRDC data for integrative analysis

New **MOPAW** (Multi-Omics Pathway Workflow), a new point-and-click interface to analyze your own multi-omics data or public data sets

Cancer Moonshot Data Resources

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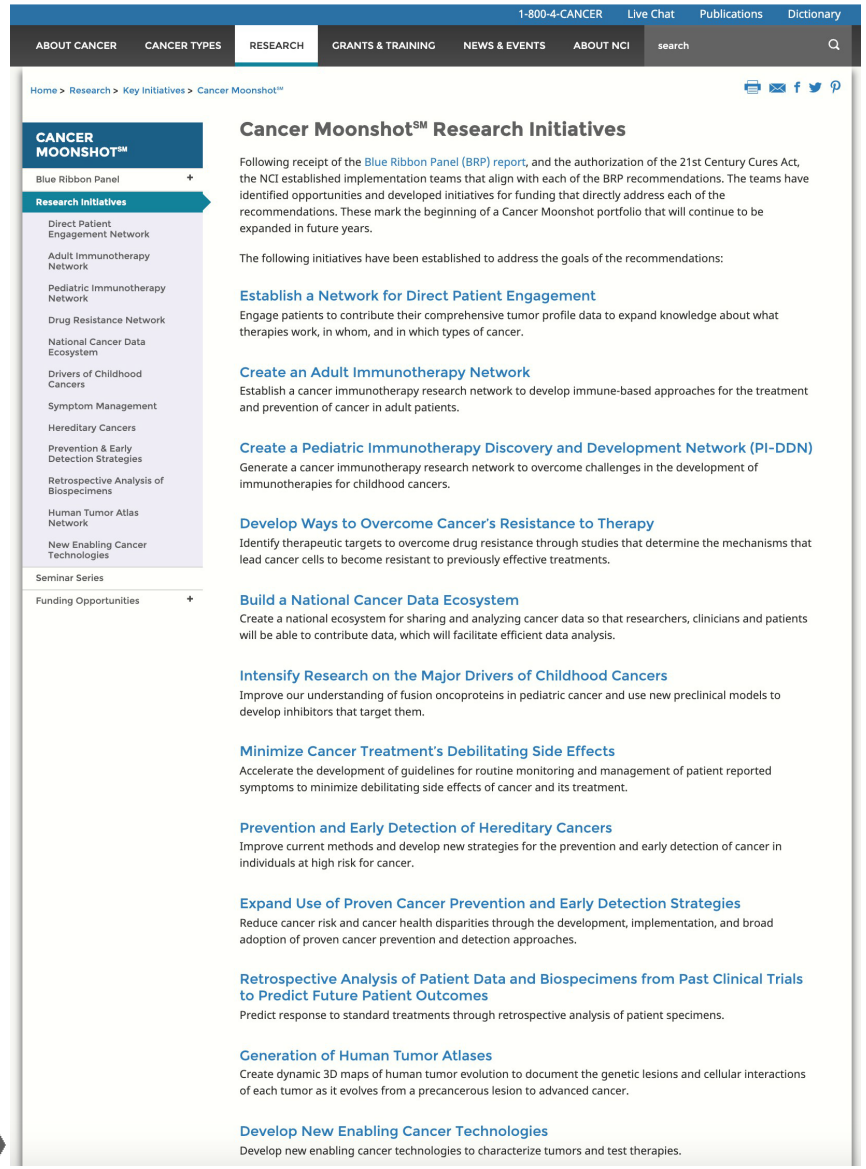
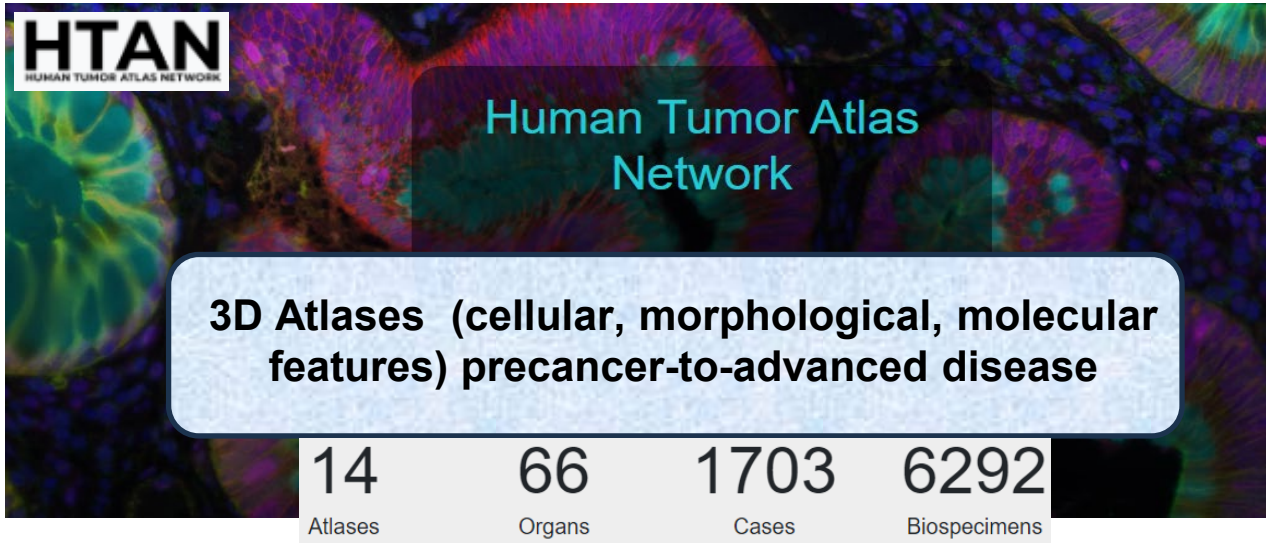




➡ **CRDC** https://humantumoratlas.org/

IOTN
Immuno-Oncology Translational Network

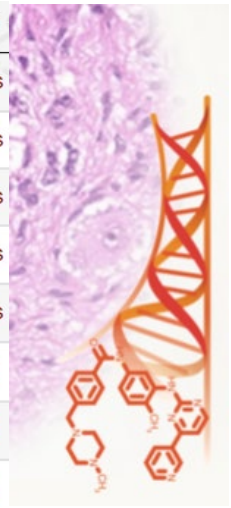
IOTN Data Sharing Catalog

https://www.cancer.gov/research/key-initiatives/moonshot-cancer-initiative
https://www.iotnmoonshot.org/en/resources/data-sharing-catalog/

NCI Data Resources

CTD² Data Portal (Cancer Target Discovery and Development)

Center Name	Submissions
Broad Institute	26 submissions
Cold Spring Harbor Laboratory	15 submissions
Columbia University	40 submissions
Dana-Farber Cancer Institute	34 submissions
Emory University	23 submissions
Fred Hutchinson Cancer Research Center (1)	8 submissions
Fred Hutchinson Cancer Research Center (2)	3 submissions
Oregon Health and Science University (2)	7 submissions
Stanford University	10 submissions
Translational Genomics Research Institute	4 submissions
University of California San Diego	3 submissions
University of California San Francisco (1)	11 submissions
University of California San Francisco (2)	8 submissions
University of Texas MD Anderson Cancer Center	12 submissions
University of Texas Southwestern Medical Center	7 submissions



https://ocg.cancer.gov/programs/ctd2/data-portal

Cancer Systems Biology Consortium (CSBC)

https://www.cancer.gov/about-nci/organization/dcb/research-programs/csbc

Physical Sciences - Oncology Network (PS-ON)

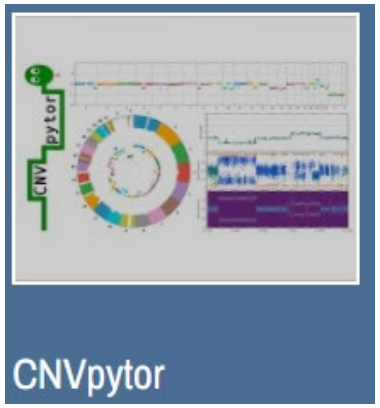
https://physics.cancer.gov

Cancer Complexity Knowledge Portal

https://www.cancercomplexity.synapse.org/

Data Analysis Tools

NCI Informatics Technology for Cancer Research



Introductory videos to many of the ITCR tools available

partial list..

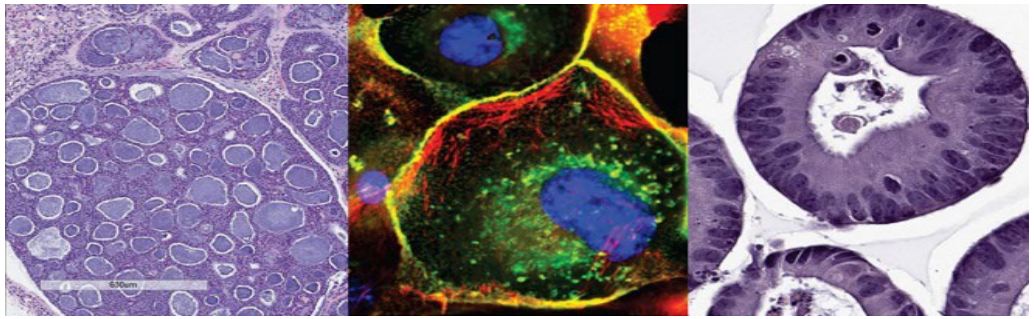
Title	Category	URL
DINC 2.0	-omics	https://dinc.kavrakilab.org/help/
SlicerDMRI	Imaging	http://dmri.slicer.org/videos/
FHIR ShEx	Data Standards	https://www.youtube.com/watch?v=
THRIVE	Imaging	https://www.youtube.com/channel/U
The Cancer Imaging Archive (TCIA)	Imaging	https://vimeo.com/200254396
QIIME2	-omics, Network Biology	https://www.youtube.com/watch?v=
Trinity	-omics	https://www.youtube.com/watch?v=
Federated Tumor Segmentation (FeTS)	Imaging	https://www.youtube.com/watch?v=
PDX Finder	-omics	https://www.youtube.com/watch?v=
CNVnator/CNVpytor	-omics	https://www.youtube.com/watch?v=
A high-level introduction to QIIME	-omics, Network Biology	https://www.youtube.com/watch?v=
What is Globus?	Imaging, -omics, Clinical, Data Standards, Network Biology	https://vimeo.com/437243813
CaPTk Introductory Video	Imaging	https://www.youtube.com/watch?v=
CIViC	-omics, Clinical	https://www.youtube.com/watch?v=
The Cancer Proteome Atlas Portal (TCPA)	-omics	https://www.youtube.com/watch?v=
IGV	-omics	https://www.youtube.com/watch?v=
XNAT	Imaging	https://www.youtube.com/watch?v=
Galaxy P multi-omics	-omics	http://bit.ly/2X2luxB
XNAT Imaging Informatics Platform	Imaging	https://www.youtube.com/watch?v=

https://itcr.cancer.gov/informatics-tools

NCI Resources for Researchers

Clinical Resources

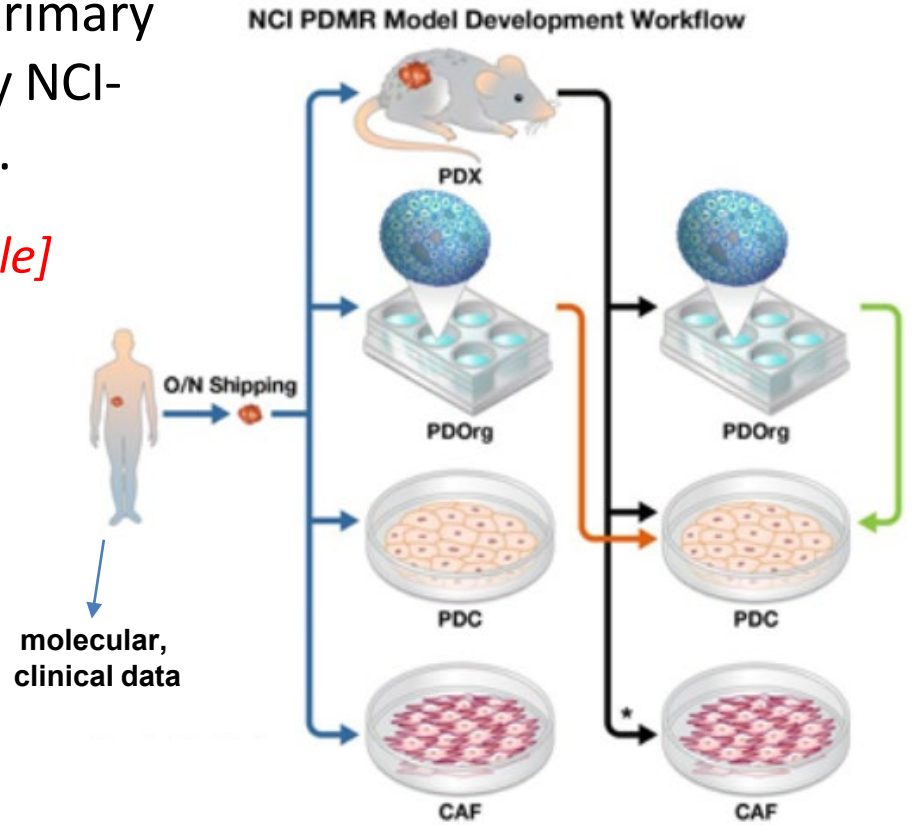
Patient-Derived Models Repository (PDMR)



A national repository of Patient-Derived Models (PDMs) from primary and metastatic tumor tissues and blood specimens supplied by NCI-supported clinical trials, research programs and Cancer Centers.

- Patient-derived xenografts (PDX) *[364 available]*
- Patient-derived tumor cell cultures (PDC) *[367]*
- Cancer-associated fibroblasts (CAF) *[384]*
- Patient-derived organoids (PDOrg) *[350]*

❑ **>280 Model Sets with PDX : PDOrg : PDC**



https://pdmr.cancer.gov
NCI_PDM_Repository@mail.nih.gov

PREVENT Cancer Preclinical Drug Development Program (PREVENT)

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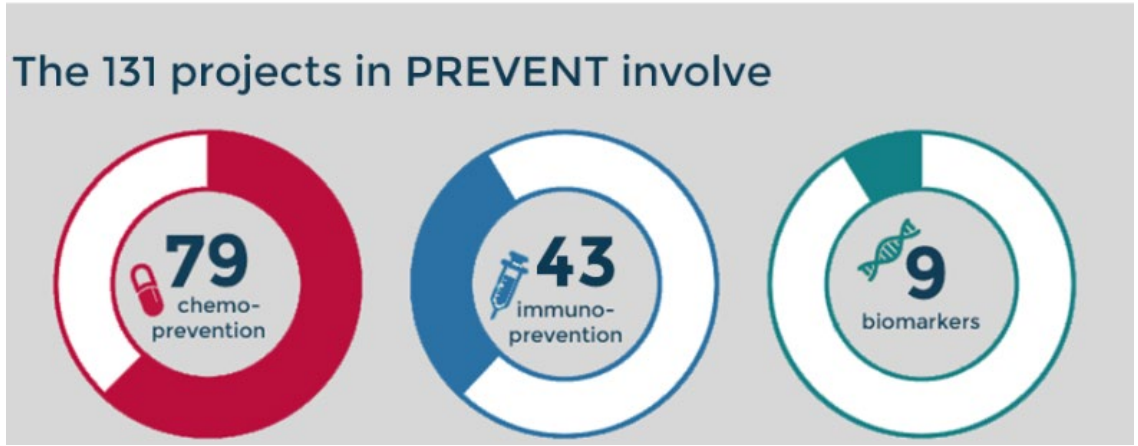
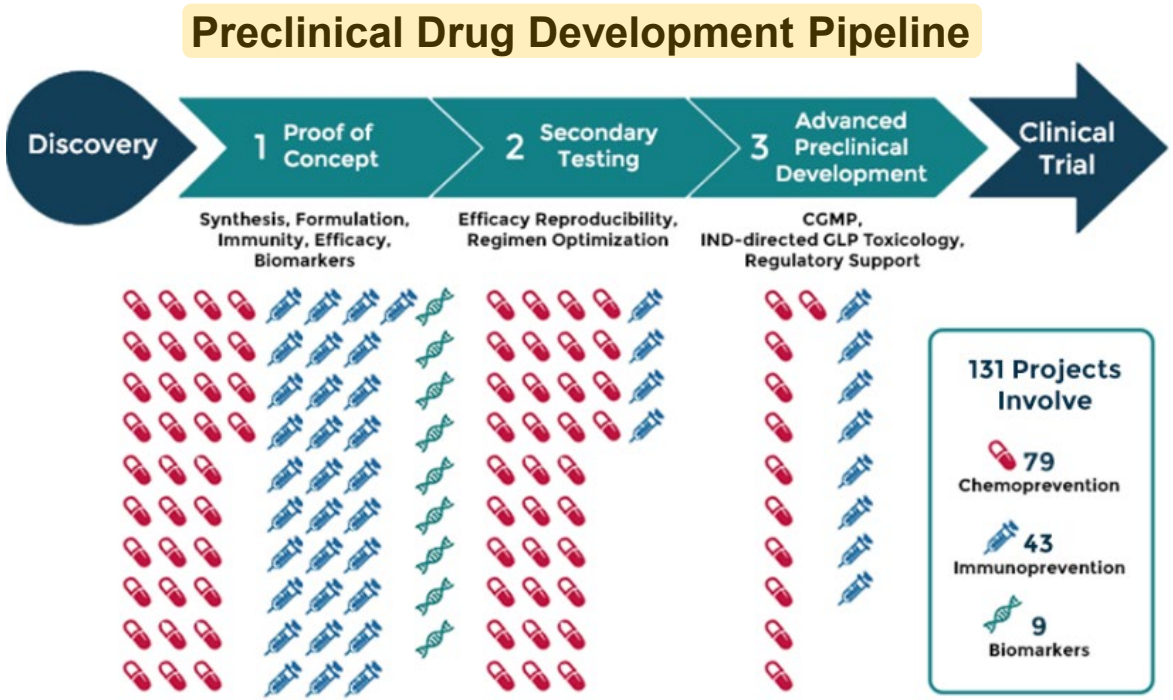
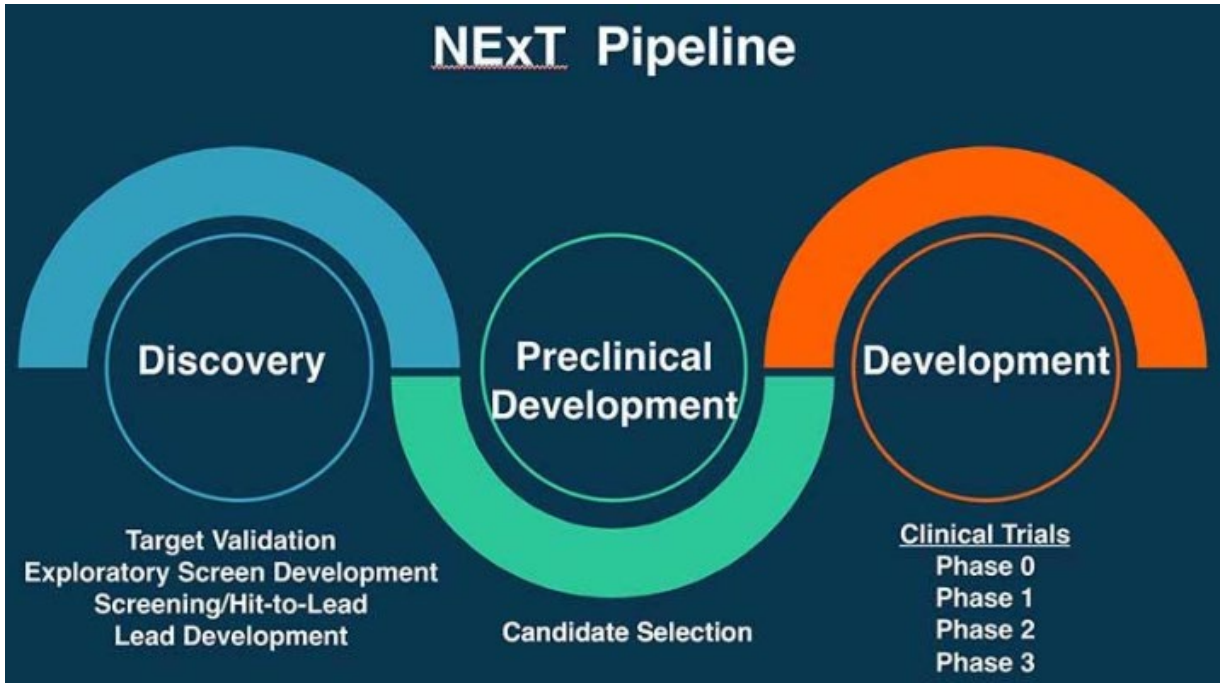
PREVENT Cancer Preclinical Drug Development Program (PREVENT) supports the best ideas in cancer prevention using NCI contract resources





https://prevention.cancer.gov/major-programs/prevent-cancer-preclinical-drug-development-program-prevent

NCI Experimental Therapeutics (NExT)



Provides resources for projects focused on developing therapies for unmet medical needs in the area of oncology that are not typically addressed by the private sector.

NExT is not a grant mechanism. The NCI will partner with successful applicants to facilitate milestone-driven progression of new **anticancer drugs and imaging agents** towards clinical evaluation and registration.
Three application dates per year.

https://next.cancer.gov

Annotated Biospecimens

National Clinical Trials Network Navigator (NCTN Navigator)

- For cancer researchers interested in conducting studies using **specimens and clinical data collected from cancer treatment trials**
- Specimens are donated by patients in NCI-sponsored, completed Phase III trials and include **tumor tissue, nucleic acids, blood, bone marrow,…**

https://navigator.ctsu.org/navigator/login

Navigator Process Flow

DCB and NCI Resources for Researchers

Experimental Resources

Clinical Resources

Data Resources

https://www.cancer.gov/research/resources

https://www.cancer.gov/about-nci/organization/dcb/researcher-resources

Repositories for data sharing

NIH DMS policy https://sharing.nih.gov/data-management-and-sharing-policy

- **NIH-supported Scientific Data Repositories** (138 listed currently)

NCI	Proteomic Data Commons (PDC)
NCI	The Network Data Exchange (NDEx)
NCI	Imaging Data Commons (IDC)
NCI	Genomic Data Commons (GDC)

https://sharing.nih.gov/data-management-and-sharing-policy/sharing-scientific-data/repositories-for-sharing-scientific-data

- **Generalist repositories**

- Dataverse
- Dryad
- Figshare
- IEEE Dataport
- Mendeley Data
- Open Science Framework
- Synapse
- Vivli
- Zenodo

https://sharing.nih.gov/data-management-and-sharing-policy/sharing-scientific-data/generalist-repositories