The Cancer Imaging Archive (TCIA): CPTAC Radiology and Histopathology Imaging Research Efforts

Brenda Fevrier-Sullivan[1], Justin Kirby[1], Kirk Smith[2], Tracy Nolan[2], Bill Bennett[2], Brittney Camp[2], Natasha Honomichl[2], Ryan Birmingham[3], Fred Prior[2], Ramesh Avula[1], Luis Cordeiro[1], Pam Angelus[1], John Freymann[1]

[1]Frederick National Laboratory for Cancer Research, [2]University of Arkansas for Medical Sciences, [3]Emory University

http://cancerimagingarchive.net

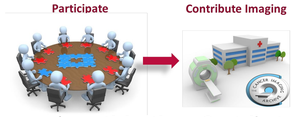
sponsored by the National Cancer Institute

The Cancer Imaging Archive (TCIA) is the National Cancer Institute's (NCI) repository of publicly accessible cancer imaging. TCIA supports the Clinical Proteomic Tumor Analysis Consortium (CPTAC) by hosting and de-identifying clinical radiological images and pathology images to augment the consortium's proteogenomic analyses with imaging phenotypes.

Why Imaging?

- Imaging is a clinical endpoint
- Imaging can improve the pace and accuracy of cancer-related 'omic discoveries because it provides:
  - Temporal context: progression of disease, impact of treatments and interventions
  - Spatial context: heterogeneity of tumor and tissue and micro-environments
- Imaging can validate and improve existing biomarkers
- Imaging is available non-invasively and often part of a patient's Standard Of Care

Become a Radiology Image Provider!



Data collection depends on everyone's participation. Contribute imaging to ensure that the ultimate goal of producing a more unified understanding of tumor biology is achieved.

Here's how....

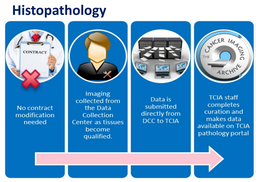
- Contact your Technical Project Manager (TPM) for more information, who will...
  - ✓ Ensure contractual obligations and technical requirements are met.
  - ✓ Connect you with the TCIA support team who will work with you on the data submission process.
- Submit your images to TCIA!

For more information contact:
Negin.Vatanian@nih.gov or Melissa.Borucki@nih.gov

TCIA Image Collection Workflows

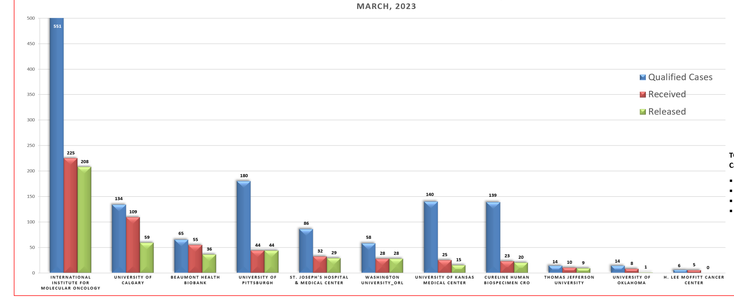
Radiology

Histopathology



CPTAC Radiology Imaging Accrual by Site

RADIOLOGY IMAGING RECEIVED FROM PARTICIPATING SITES WITH QUALIFIED CASES
MARCH, 2023



TCIA Participating Sites with No Qualified Cases to date

- Mayo Clinic
- Morehouse School of Medicine, Inc.
- Ochsner Clinic Foundation
- Phase Clinical Services

CPTAC Imaging on TCIA

Status of Available Data

Radiology and histopathology imaging data are released on TCIA when a CPTAC cohort is ready for publication. For the latest status of accrual visit: http://bit.ly/2UEUjrx

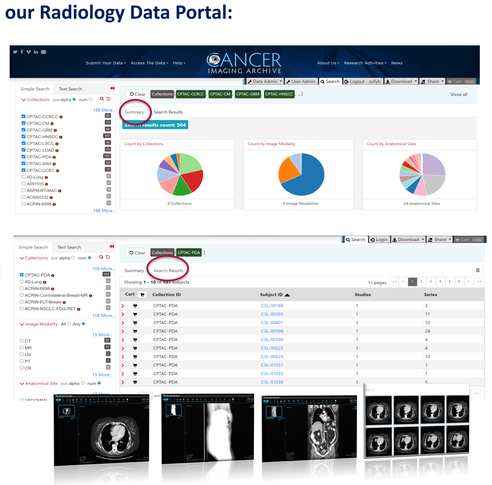
Collection	Cancer Type	Location	Radiology Modalities	Radiology Subjects	Histopathology Subjects
CPTAC-AML	Acute Myeloid Leukemia	Marrow, Blood	--	--	88
CPTAC-CCRCC	Clear Cell Carcinoma	Kidney	CT, MR,	60	222
CPTAC-CM	Cutaneous Melanoma	Skin	CT, MR, PT	13	92
CPTAC-GBM	Glioblastoma Multiforme	Brain	CT, MR	66	189
CPTAC-HNSCC	Head and Neck Squamous Cell Carcinoma	Head-Neck	CT, MR, PT	101	112
CPTAC-LSCC	Squamous Cell Carcinoma	Lung	CR, PT	36	212
CPTAC-LUAD	Adenocarcinoma	Lung	CT, MR, PT	25	244
CPTAC-PDA	Pancreatic Ductal Adenocarcinoma	Pancreas	CT, MR, PT, US	107	168
CPTAC-SAR	Sarcomas	Abdomen, Arm, Bladder, Chest, Head-Neck, Kidney, Leg, Retroperitoneum, Stomach, Uterus	CT, MR, PT	24	88
CPTAC-UCEC	Corpus Endometrial Carcinoma	Uterus	CT, MR, PT, CR	72	250

CPTAC 2 Cohorts

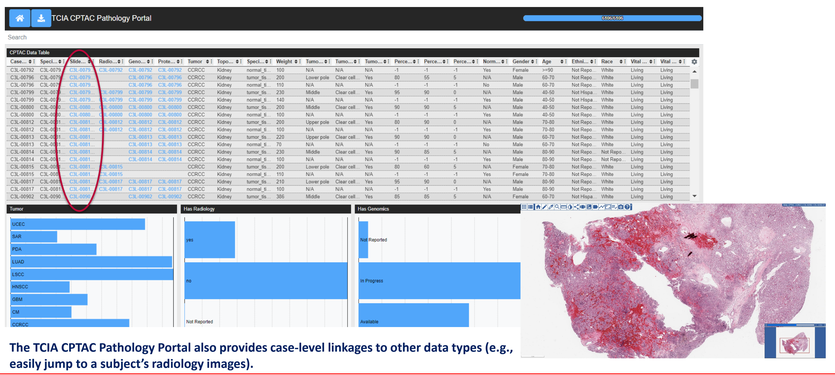
Collection	Cancer Type	Location	Pathology Subjects
CPTAC-BRCA	Breast Invasive Carcinoma	Breast	134
CPTAC-COAD	Colon Adenocarcinoma	Colon	106
CPTAC-OV	Ovarian Serous Cystadenocarcinoma	Ovary	102

How to Access the Data

Radiology images are in DICOM format. They can be visualized, bulk downloaded by cancer type, or filtered by various criteria using our Radiology Data Portal:



Pathology images may also be visualized, downloaded in bulk, or filtered based on slide characteristics and clinical data.



The TCIA CPTAC Pathology Portal also provides case-level linkages to other data types (e.g., easily jump to a subject's radiology images).

CPTAC Imaging Research Activities

38 publications between 2019 and 2023 have leveraged CPTAC imaging data

American Journal of Pathology, Cancer Cell, Modern Pathology, The Lancet Digital Health, Neuro-Oncology, Journal of Magnetic Resonance Imaging, Frontiers in Oncology, Journal of Personalized Medicine, etc.

CPTAC Imaging Special Interest Group (SIG)

The Cancer Imaging Informatics Lab at Frederick National Laboratory for Cancer Research (FNLCR) has established a CPTAC Imaging Special Interest Group (SIG). The purpose of the SIG includes:

- Informing the research community about publications guidelines and how to access the data from TCIA and the related databases housing the genomics, proteomics, and clinical data.
- Educating the imaging research community about discoveries coming from the CPTAC proteomics and genomics teams to increase understanding of how image analyses can contribute to an improved understanding of these patients.
- Encouraging collaboration on data wrangling tasks in order to reduce duplicative efforts by researchers seeking to leverage these data.
- Provide a venue for imaging researchers to present their work on CPTAC data.

Anyone is free to join the discussion group by visiting https://bit.ly/2UVfMRY. Currently there are 283 members in the group. Past webinar videos and slides are available at: https://bit.ly/2IECc1F

Coming Soon!

Labeled CPTAC Imaging Data for Tumor Detection & Segmentation

The Cancer Imaging Program is making the CPTAC radiology imaging even more valuable and easy to use for AI and feature extraction. Select CPTAC imaging collections on TCIA are being reviewed by a panel of expert radiologists who will curate them and segment and label the tumors and provide tumor volumes. This information will be shared on TCIA and will facilitate the quantitative integration of the imaging data with CPTAC proteogenomics results.

Scan here For more information on TCIA's CPTAC Imaging collections

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