

# CPTAC Imaging Proteomics

The National Cancer Institute's [Clinical Proteomic Tumor Analysis Consortium \(CPTAC\)](#) is a national effort to accelerate the understanding of the molecular basis of cancer through the application of large-scale proteome and genome analysis, or proteogenomics. Data (genomics, proteomics, imaging), assays, and reagents are made available to the public as a Community Resource to accelerate cancer research and advance patient care. TCIA has partnered with CPTAC to host both the radiology and pathology imaging data generated by the project.

## CPTAC Imaging Special Interest Group

You can join the [CPTAC Imaging Special Interest Group](#) to be notified of webinars & data releases, collaborate on common data wrangling tasks and seek out partners to explore research hypotheses! Artifacts from previous webinars such as slide decks and video recordings can be found on the [CPTAC SIG Webinars](#) page.

On July 1, 2019 representatives from the CPTAC program presented to the Imaging SIG. This included an overview of the program and tutorials about how to access the data in the various CPTAC websites:

- Welcome (Bob Nordstrom)
- [Clinical Proteomic Tumor Analysis Consortium \(CPTAC\) Project Overview](#) (Chris Kinsinger, 15min)
- CPTAC radiology & pathology image data at TCIA – live demo (Justin Kirby, 15min)
- [CPTAC Data Portal and the Proteomics Data Commons](#) (R. Rajesh Thangudu, 30min)
- [CPTAC genomic data at the Genomics Data Commons](#) (Ana Robles, 15min)

# CPTAC Imaging Cohorts

CPTAC imaging data is being made available on a release schedule [that is coordinated with the CPTAC program releases of proteomic and genomic data.](#)

Learn more about each cancer type by clicking on the collection names in the table below. Data currently available is listed below. Clicking on the number of subjects will take you to these data portals with that particular cancer type pre-selected. You can access the radiology and pathology data directly from the respective data portals.

- [Radiology Data Portal](#)
- [Pathology Data Portal](#)

| Collection                  | Cancer Type                                  | Location      | Radiology Modalities  | Radiology Tumor Annotations                   | Radiology Total Subjects | Pathology Total Subjects |
|-----------------------------|----------------------------------------------|---------------|-----------------------|-----------------------------------------------|--------------------------|--------------------------|
| <a href="#">CPTAC-AML</a>   | <b>Acute Myeloid Leukemia</b>                | Marrow, Blood |                       |                                               |                          | 88                       |
| <a href="#">CPTAC-CCRCC</a> | <b>Clear Cell Carcinoma</b>                  | Kidney        | CT, MR, RTSTRU CT     | <a href="#">CPTAC-CCRCC-Tumor-Annotations</a> | 65                       | 222                      |
| <a href="#">CPTAC-CM</a>    | <b>Cutaneous Melanoma</b>                    | Skin          | CT, MR, PT            |                                               | 13                       | 92                       |
| <a href="#">CPTAC-GBM</a>   | <b>Glioblastoma Multiforme</b>               | Brain         | CT, MR                |                                               | 66                       | 178                      |
| <a href="#">CPTAC-HNSCC</a> | <b>Head and Neck Squamous Cell Carcinoma</b> | Head-Neck     | CT, MR, PT, RTSTRU CT | <a href="#">CPTAC-HNSCC-Tumor-Annotations</a> | 122                      | 112                      |
| <a href="#">CPTAC-LSCC</a>  | <b>Squamous Cell Carcinoma</b>               | Lung          | CT, PT                |                                               | 36                       | 212                      |
| <a href="#">CPTAC-LUAD</a>  | <b>Adenocarcinoma</b>                        | Lung          | CT, MR, PT            |                                               | 25                       | 244                      |
| <a href="#">CPTAC-PDA</a>   | <b>Pancreatic Ductal Adenocarcinoma</b>      | Pancreas      | CT, MR, PT, US        | <a href="#">CPTAC-PDA-Tumor-Annotations</a>   | 108                      | 168                      |

|                            |                                     |                                                                                        |                |                                              |    |     |
|----------------------------|-------------------------------------|----------------------------------------------------------------------------------------|----------------|----------------------------------------------|----|-----|
| <a href="#">CPTAC-SAR</a>  | <b>Sarcomas</b>                     | Abdomen, Arm, Bladder, Chest, Head-Neck, Kidney, Leg, Retroperitoneum, Stomach, Uterus | CT, MR, PT     |                                              | 24 | 88  |
| <a href="#">CPTAC-UCEC</a> | <b>Corpus Endometrial Carcinoma</b> | Uterus                                                                                 | CT, MR, PT, US | <a href="#">CPTAC-UCEC-Tumor-Annotations</a> | 85 | 250 |

### Corresponding Genomic, Proteomic, and Clinical Data

The other data types will be hosted in separate tools and databases including:

1. [CPTAC Data Portal](#)
2. [Proteomic Data Commons](#)
3. [Genomic Data Commons](#)
4. CPTAC Python/R notebooks are available at <https://github.com/PayneLab/cptac> and on Google Colab at <https://colab.research.google.com/github/PayneLab/cptac/blob/master/notebooks/ekMMht7.py>.

## CPTAC 2 Cohorts

| Collection                 | Cancer Type                              | Location | Pathology (Subjects) |
|----------------------------|------------------------------------------|----------|----------------------|
| <a href="#">CPTAC-BRCA</a> | <b>Breast Invasive Carcinoma</b>         | Breast   | 134                  |
| <a href="#">CPTAC-COAD</a> | <b>Colon Adenocarcinoma</b>              | Colon    | 106                  |
| <a href="#">CPTAC-OV</a>   | <b>Ovarian Serous Cystadenocarcinoma</b> | Ovary    | 102                  |

## CPTAC - TCGA Cancer Proteome Studies

There are 28 ovarian (TCGA-OV) and 14 breast (TCGA-BRCA) cases in TCIA which have corresponding CPTAC phase 2 proteomic analysis data. The Proteomic Analysis Data is available at: <https://pdc.cancer.gov/pdc/browse>.

### Images and Clinical Data Downloads

These subsets of radiology images can be accessed using the following links:

- [CPTAC Proteomic Breast TCIA TCGA cases](#)
- [CPTAC Proteomic Ovarian TCIA TCGA cases](#)

The clinical data for these subjects can be found in these spreadsheets:

- [TCGA-BRCA Clinical data](#)
- [TCGA-OV Clinical data](#)

### References

An early CPTAC publication which reports on a more comprehensive collection of cases from those TCGA tumor data collections (BRCA and OV) can be found at: "Comprehensive quantitative analysis of ovarian and breast cancer tumor peptidomes". Xu Z, et al., *J Proteome Res.* 2015 Jan 2;14(1):422-33. doi: [10.1021/pr500840w](https://doi.org/10.1021/pr500840w).

An excellent review of proteomic biomarkers is the publication: "Proteomics in cancer biomarkers discovery: challenges and applications." Sallam RM1. *Dis Markers.* 2015;2015:321370. doi: [10.1155/2015/321370](https://doi.org/10.1155/2015/321370).

Also: Identification of protein biomarkers in human serum using iTRAQ and shotgun mass spectrometry *Methods Mol Biol.* 2013;1061:291-307. doi: [10.1007/978-1-62703-589-7\\_18](https://doi.org/10.1007/978-1-62703-589-7_18). [Koutroukides TA](#)1