

# Research Projects

There are a number of activities testing science and tools against the image data collections found on The Cancer Imaging Archive. Are you interested in forming an ad-hoc research team around one of the other TCIA image collections? Contact us at [help@cancerimagingarchive.net](mailto:help@cancerimagingarchive.net) to discuss how we can encourage your research.

## Challenge competitions

Data from TCIA collections have and continue to be used for image analysis challenges or competitions, e.g., image segmentation or tumor classification. Specific challenges leveraging our data are described below. Please note that the challenges are not managed by TCIA staff, and in many cases you will be sent to web sites that are not affiliated with TCIA to learn more about them.

- **LUNGx SPIE-AAPM-NCI Lung Nodule Classification Challenge** — As part of the 2015 SPIE Medical Imaging Conference <http://spie.org/x12166.xml>, SPIE – with the support of American Association of Physicists in Medicine (AAPM) and the National Cancer Institute (NCI) – will conduct a “Grand Challenge” on quantitative image analysis methods for the diagnostic classification of malignant and benign lung nodules. The LUNGx Challenge <http://spie.org/MI/special-events/Technical-Event> will provide a unique opportunity for participants to compare their algorithms to t
- **MICCAI 2014 Grand Challenges** — MICCAI 2014 <http://miccai2014.org/> will provide an excellent opportunity for a day long cluster of events in brain tumor computation (September 14, 2014). It will be composed of a workshop and radiologic and pathology image processing challenges that discuss and showcase the value of open science in addressing some of the challenges of Big Data in the context of brain cancer.
- **MICCAI 2015 – Computational Brain Tumor Cluster of Events (CBTC)** — The Computational Brain Tumor Cluster of Event (CBTC) 2015 will be held on Oct 9 in Munich, Germany, in conjunction with MICCAI 2015 <http://www.miccai2015.org/>. It <http://www.miccai2015.org/> will consist of a morning workshop and afternoon challenges. (see preliminary program here)
- **NCI-ISBI 2013 Challenge - Automated Segmentation of Prostate Structures** — The National Cancer Institute’s (NCI’s) Cancer Imaging Program in collaboration with the International Society for Biomedical Imaging (ISBI) has launched a grand challenge involving prostate gland magnetic resonance imaging (MRI) data. The challenge will take place at the ISBI Symposium <http://www.biomedicalimaging.org/2013/>, April 7-11, 2013 in San Francisco, CA.
- **NCI-MICCAI 2013 Grand Challenges in Image Segmentation** — The National Cancer Institute’s (NCI’s) Cancer Imaging Program in collaboration with the 16th international conference on Medical Image Computing and Computer Assisted Interventions (MICCAI) 2013 has launched two grand segmentation challenges involving clinically relevant prostate structures and brain tumor components based on magnetic resonance imaging (MRI) data. The event will take place at MICCAI 2013 meeting (<http://www.miccai2013.org/> <http://www.miccai2013.org/>) on September 22 in Nagoya, J
- **QIN Lung CT Segmentation Challenge** — The goal of the CT segmentation challenge was to compare the bias (where possible) and repeatability of automatic, semi-automatic and manual segmentations for lung CT studies. Investigators from Columbia, MGH, Moffitt and Stanford identified 52 lung CT nodules and made available the data in DICOM format. Algorithm developers and users were requested to submit at least 4 repetitions of their algorithm for each nodule. A variety of image formats for the segmentation volumes were utilized including

## CIP TCGA Radiology Initiative

Driven by input from the scientific community, the Cancer Imaging Program (CIP) <http://imaging.cancer.gov/> stands at the crossroad of two powerful scientific requisites: the need for cross-disciplinary research and the increase of inter-institutional data sharing. The Cancer Imaging Archive (TCIA) <http://www.cancerimagingarchive.net/> is building a research community focused on connecting cancer phenotypes to genotypes by providing clinical images matched to subjects from The Cancer Genome Atlas

- **TCGA Bladder Phenotype Research Group** — The Cancer Genome Atlas (TCGA) Bladder Phenotype Research Group is part of the Cancer Imaging Project  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>; an effort to build a research community focused on connecting cancer phenotypes to genotypes by providing clinical images matched to tissue specimens analyzed for The Cancer Genome Atlas (TCGA) <http://canc>
- **TCGA Breast Phenotype Research Group** — The Cancer Genome Atlas (TCGA) Breast Phenotype Research Group is part of the Cancer Imaging Project  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>; an effort to build a research community focused on connecting cancer phenotypes to genotypes by providing clinical images matched to tissue specimens analyzed for The Cancer Genome Atlas (TCGA) <http://cance>
- **TCGA Glioma Phenotype Research Group** — The Cancer Genome Atlas (TCGA) Glioma Phenotype Research Group is part of the Cancer Imaging Project  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>; an effort to build a research community focused on connecting cancer phenotypes to genotypes by providing clinical images matched to tissue specimens analyzed for The Cancer Genome Atlas (TCGA) <http://cance>
- **TCGA Head-Neck Phenotype Research Group** — The Cancer Genome Atlas (TCGA) Head-Neck Phenotype Research Group is part of the Cancer Imaging Project  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>; an effort to build a research community focused on connecting cancer phenotypes to genotypes by providing clinical images matched to tissue specimens analyzed for The Cancer Genome Atlas (TCGA) <http://ca>
- **TCGA-LGG Phenotype Research Group** — The Cancer Genome Atlas-Lower Grade Glioma (TCGA-LGG) Phenotype Research Group is part of the Cancer Imaging Program TCGA Radiology Initiative  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative> focused on analyzing images from the TCGA-LGG <https://wiki.cancerimagingarchive.net/display/Public/TCGA-LGG> collections. Images which correlate to the LGG tissue data in TCGA's Data Portal <http://tcga-data.nci.nih.gov/tcga/tcgaHome2.jsp> are continuing to be gathered for sub
- **TCGA-LIHC Phenotype Research Group** — The Cancer Genome Atlas-Liver Hepatocellular Carcinoma (TCGA-LIHC) Phenotype Research Group is part of the Cancer Imaging Program TCGA Radiology Initiative  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative> focused on analyzing images from the TCGA-LIHC <https://wiki.cancerimagingarchive.net/display/Public/TCGA-LIHC> collection. Multiple modalities of images, which correlate to the LIHC data in the TCGA Data Portal <http://tcga-data.nci.nih.gov/tcga/tcgaHome2.jsp>, ar
- **TCGA Lung Phenotype Research Group** — The Cancer Genome Atlas (TCGA) Lung Phenotype Research Group is part of the Cancer Imaging Program <https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative> TCGA Radiology Initiative <https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative> focused on analyzing images from the TCGA- Lung Adenocarcinoma (LUAD) <https://wiki.cancerimagingarchive.net/display/Public/TCGA-LUAD>) collection. Multiple modalities of images which correlate to the lung tissue
- **TCGA Ovarian Phenotype Research Group** — The Cancer Genome Atlas (TCGA) Ovarian Phenotype Research Group is part of the Cancer Imaging Project

<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>; an effort to build a research community focused on connecting cancer phenotypes to genotypes by providing clinical images matched to tissue specimens analyzed for The Cancer Genome Atlas (TCGA) <http://canc>

- **TCGA Prostate Phenotype Research Group** — The Cancer Genome Atlas (TCGA) Prostate Phenotype Research Group is part of the Cancer Imaging Project  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative> focused on analyzing images from the TCGA- Prostate Adenocarcinoma (PRAD <https://wiki.cancerimagingarchive.net/display/Pub>
- **TCGA Renal Phenotype Research Group** — The Cancer Genome Atlas (TCGA) Renal Phenotype Research Group is part of the Cancer Imaging Project <https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>  
<https://wiki.cancerimagingarchive.net/display/Public/CIP+TCGA+Radiology+Initiative>; an effort to build a research community focused on connecting cancer phenotypes to genotypes by providing clinical images matched to tissue specimens analyzed for The Cancer Genome Atlas (TCGA) <http://cancer>
- **TCGA Research on the Cloud** — In an effort to streamline IT and informatics resources used as part of various research projects, the Cancer Imaging Program (CIP) has deployed a cloud infrastructure on Amazon EC2. The following instructions summarize how to connect to your cloud computer once you've been assigned one as part of the CIP TCGA Radiology Initiative.

## CPTAC Imaging Proteomics

NCI has announced resources for the Clinical Proteomic Tumor Analysis Consortium (CPTAC) (<http://proteomics.cancer.gov/> <http://proteomics.cancer.gov/>) aimed at integrating proteomic research with genomics to produce a more unified understanding of tumor biology. As the CPTAC available tissue donor resources begin to ramp up, a number of legacy TCGA genetic-focused cases -- CPTAC analyzed -- have diagnostic images already accessible on The Cancer Imaging Archive (TCIA).

RSNA 2016 Sessions Using TCIA

WUSM Center for Multiple Myeloma Nanotherapy