

The UCLA-CTSI provides many state of the art technology cores and specialized service cores available to investigators. The technology core described below is available at Lundquist/Harbor-UCLA. Applications for utilization of these resources are reviewed by the Scientific Advisory Committee of the UCLA-CTSI at Lundquist/Harbor-UCLA. Support for investigators using this core is provided through a voucher system. Please contact the UCLA-CTSI office at 310-222-2503.

LUNDQUIST CT CORE

Description

The Computed Tomographic Core Laboratory (CT Core) supports clinical research projects both from within our institution and from over 60 outside institutions in NIH sponsored clinical studies. The CT Core specializes in cardiac, vascular and body composition imaging using advanced CT workstations, advanced quality control methods, systems storage and analytical methods for multiple investigations. It provides unique services in atherosclerosis imaging including plaque quantification, perfusion imaging and diagnostic services. The center also specializes in bone density assessment with CT, working with multiple studies regarding osteoporosis. Other areas of focus include lung, visceral fat and abdominal high resolution CT imaging, and the CT Reading Center offers collaborations in the area of renal, hepatic, vascular and pulmonary imaging, as well as body composition (musculoskeletal) and endothelial function assessment. The Research Cardiac CT scanner is immediately adjacent to the laboratory.

The core also offers carotid intimal media imaging for atherosclerosis and plaque assessment, echocardiography (cardiac ultrasound), endothelial function testing (multiple platforms available).

Computed Tomographic Reading Core Laboratory Resources

- One advanced imaging scanner dedicated to cardiac, lung and vascular research imaging (General Electric Revolution 256 detector CT scanner with Iterative Reconstruction and High Definition upgrades installed 2016).
- Eleven General Electric Advantage Workstations with advanced capabilities for plaque imaging and perfusion assessment.
- A Philips Brilliance (one PACS system supporting up to 16 workstations), Siemens Leonardo (one workstation), Vital Images Vitrea (two workstations), TeraRecon (two workstations), Image Analysis (two workstations) for bone density measurements, Rephot Imaging (1 workstation) for calcium scoring and phantom adjustment, Osirix (five workstations), for calcium scoring, abdominal fat, volume, and density measurements; each with advanced applications for quantitative measures.
- The heart of the CT Reading Center is a group of 6 PACS (Picture Archiving and Communications Systems) servers. The PACS servers have the dual use of receiving CT images (DICOM format) from external centers as well as storing the CT images for use in the reading center.
- Our current office space houses a total of 55 computers / workstations for multiple and ongoing studies, all linked to central PACS Services.
- A new NIH funded state of the art \$9.8 Million Dollar facility is completed and houses the CT Core lab since October 2012.

Services Available to Investigators Conducting Research

- High resolution imaging of all body parts, using an advanced Multi-Detector General Electric Scanner, with iterative reconstruction, prospective imaging and all software/hardware packages
- Sample storage: The PACS servers run customized software developed by our staff using open source tools. This cost effective solution allows us to create servers on demand, running on off-the-shelf workstation hardware.
- Backup and Long Term Data Management: CT image data (DICOM images) are kept on the PACS servers using high-speed external drives housed in dual-disk redundant enclosures. As a further backup solution, data is also archived offline using hard drives, CD/DVDs, or Blu-Ray media as determined by the needs of each project.
- Digital Communication: The PACS servers are connected to a high-speed (gigabit) LAN with access to the Internet secured by an institutional firewall. This allows only external scanning sites that have our permission; access to send us DICOM formatted CT images. This restricts access to our systems and prevents any unauthorized alterations to our files

or data. The PACS servers and reading center staff has demonstrated its capabilities to manage and coordinate the flow of CT images from over 60 external facilities.

- Workstations: The reading center maintains DICOM (CT image) review workstations with software from 7 vendors. The varieties of software we maintain allows us choose the best tools necessary to complete a project. All DICOM review workstations are connected by a secure gigabit Ethernet LAN to the PACS servers, allowing our CT Readers to retrieve and review cases as needed. The reading center uses the following workstations/software and their capabilities:
- Consultation related to protocol development and study site preparation: Consultation on technical problem or with method development, statistical support to utilize acquired data, and setting up scanner sites and CT acquisition development.
- Training: Training is routinely provided to CTSI supported fellows and junior faculty on CTSI approved projects, and previous training includes over 100 cardiologists and radiologists, and a similar number of radiology residents and cardiology fellows.

CT core reading services are routinely provided to internal and external organizations within the CTSI network throughout the US. Recharge mechanism will be set up between the CTSI investigators or outside investigators prior to initiation of the project.

Staffing

The Computer Tomography Reading Core Laboratory personnel includes: 26 personnel, led by Matthew Budoff, including 7 full time physician readers (primarily cardiac radiologists and cardiologists), and 5 physicians leading research projects, plus ancillary support personnel, including CT and echocardiography technicians, data manager coordinators, project managers, computer IT support, data management experts, full time statistician, quality assurance experts and secretarial staff.

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Location

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