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Program Plan for the PET/CT Scanner

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Program Plan for the CTRIC PET/CT Scanner

A. Executive Summary

The University of Colorado School of Medicine and the Colorado Translational Research Imaging Center (CTRIC) propose to further their research imaging capabilities through the purchase of a PET/CT scanner. A significant goal of the university is to enhance its research capabilities and disperse the results of its studies to improve health care status. A 2009 planning retreat of the School of Medicine identified the formation of CRTIC and the acquisition of a PET/CT scanner as critical needs to augment and expand existing capabilities in research imaging. Acquisition of this unit will not only enhance existing research capabilities, but it will also allow CTRIC to expand its research imaging grant opportunities and encourage the recruitment of investigative researchers who will further expand the research capabilities of the university.

The unit will be housed in a permanently installed mobile unit adjacent to and connected to Building 400 in the research zone of the Anschutz Medical Campus (AMC). The only new construction is a concrete pad upon which the mobile unit will be sited, a connecting corridor between Building 400 and the permanently installed mobile unit, and provision of a new 200 amp power feed to the facility. Building 400 presently supports an MRI unit, and existing support areas such as parking, waiting and reception, and changing areas will be shared with the PET/CT scanner program.

This program plan is consistent with the University of Colorado Denver Strategic Plan, the University of Colorado Denver Mission, and the University of Colorado Denver Master Plan.

The project cost is estimated at $2,578,010.

The primary source of funding is a $2 million NIH-NCRR CTSA (Clinical Translational Science Award) federal grant funded through the Colorado Clinical Translational Science Institute.
University of Colorado Anschutz Medical Campus

PROGRAM PLAN FOR THE CTRIC PET/CT SCANNER

(CCTSI). The School of Medicine is providing Academic Enrichment Funds (AEFs) to cover the remainder of the project budget ($578,010).

The project schedule includes the following phases (all to occur in 2011):

- **Design:** March 1-April 12
- **Equipment Manufacturing/ Site Prep/Construction:** April 12-July 31
- **Equipment Testing/License and Certification** August 1- August 31
- **Completion/ Initiate CT/PET Imaging** September 1

**B. Goals & Objectives**

The University of Colorado Denver developed a Strategic Plan for 2008-2020. It contains many strategic priorities, goals, and objectives for the university. The Strategic Plan’s third University Strategic Priority is to “Conduct Outstanding Research and Creative Work for the Public Good” and goes on to challenge the university faculty to conduct research that commands global recognition. Goal 3.1 is to “Be a global leader in the translation and application of discovery, innovation, and creativity for the societal good.” Its related Objective 3.1.2 is to “Implement fully the Colorado Clinical and Translational Science Institute.”

The establishment of the Colorado Translational Research Imaging Center (CTRIC) and the installation of the PET/CT Scanner are integral to the implementation of this strategic priority, goal, and objective articulated in the University of Colorado Denver Strategic Plan cited above.

**C. Factual Data**

a. **Program Description**

The University of Colorado Anschutz Medical Campus is a major site for biomedical research in the Rocky Mountain region. A majority of the research on campus is conducted by researchers in the School of Medicine. In fiscal year 2009-2010, the AMC received $384,710,098 in research grants. Of that total, the School of Medicine received $311,847,315. The University of Colorado has invested significantly in the construction of its state-of-the-art Research 1 and Research 2 facilities at the AMC. Researchers at the AMC are constantly making new medical discoveries and publishing their results.

On August 16, 2007, the Board of Regents approved the establishment of the Colorado Clinical Translational Sciences Institute (CCTSI) with funding from the NIH Clinical and Translational Science Award (CTSA). CCTSI is a formal institute within the University of Colorado and is
primarily based at the AMC. It involves six health and professional schools and colleges at AMC, two at the Denver campus and two at the Boulder campus plus numerous hospital and healthcare affiliates, and 18 community-academic partnerships. The mission of CCTS1 is to create a multi-disciplinary academic home for the discipline of clinical and translational sciences, and to facilitate the more rapid translation of biomedical discoveries into prevention and intervention strategies that will improve the health of the population of Colorado. It is one of 55 similar medical research institutes nationally. A more detailed description of CCTS1 is found in the Appendices.

In the fall of 2009, the School of Medicine conducted a Research Retreat which identified research imaging and high throughput sequencing as the highest priority for capital investment in its human imaging core and genetics core laboratories. The School of Medicine further conducted a one year planning study for the formation of a nationally competitive research imaging center on the AMC. The planning grant was funded by the Strategic Initiatives Research of the School of Medicine. The study comprehensively reviewed leading research imaging centers. Site visits were made to MGH/Harvard University, Stanford University, and University of California and VA Medical Center of San Francisco. Consultations in Denver included participants from Vanderbilt University, Cornell University, and Washington University as well as 3 research imaging vendors—Siemens, Philips, and General Electric. Intra campus consultations were solicited from 36 AMC departments, centers, and affiliated hospitals.

The resulting plan recommended:

(1) Formal creation of the Colorado Translational Research Imaging Center (CTRIC) as the research imaging resource for the (AMC) Colorado Clinical and Translational Sciences Institute (CCTS1) and other centers and investigators on the AMC,

(2) Administrative support for the center,

(3) Formation of a radio chemistry/molecular chemistry research team and laboratory,

(4) Expansion of the optical imaging research laboratory,

(5) Addition of a human research PET/CT scanner,

(6) Development of necessary bioinformatics and quantitative analysis infrastructure and team to support the facility and program,

(7) Support of recruitment of imaging scientists from collaborative scientific disciplines,

(8) Research imaging pilot projects, and

(9) Support for educational programs in research imaging.

The intent of the CTRIC is to provide a Rocky Mountain regional resource to facilitate research ranging from optical imaging in cells, to preclinical imaging in animal models, and ultimately to clinical imaging to test concepts in patient populations. CTRIC is a state of the art research imaging facility supporting the campus' burgeoning clinical research portfolio. CTRIC's mission is to consolidate and expand existing research imaging resources to achieve the goals and missions of the University of Colorado Cancer Center (UCCC), Colorado Clinical and
Translational Science Institute (CCTSI), Animal Imaging Core, The Brain Imaging Center, along with other funded NIH projects.

The PET/CT scanner will draw together a diverse group of highly regarded AMC and affiliated research scientists whose funded research involves conventional imaging technologies, but whose projects would all benefit from the ability to image physiological, molecular, or cellular processes with PET. The addition of the PET/CT unit to CTRIC will markedly enhance the translational component of the center and add a new dynamic component of molecular imaging. It will place the University of Colorado School of Medicine at the forefront of medical research and enable the researchers on campus to perform fully translational research that will ultimately aid the citizens of Colorado and the nation.

Acquisition of a PET/CT unit for the CTRIC and its investigators, when combined with the existing small animal radiochemistry program will complete a translational bridge that will connect research capabilities for small animals, large animals, and humans. Currently, the AMC has the following spectrum of small animal imaging equipment: a Bruker 4.7 Tesla PharmaScan, a Siemens Inveon micro PET/CT, a Xenogen Bioluminescence system, a Visual Sonic Ultrasound System. On the human research side (excluding hospital and clinical equipment), the AMC has a GE 3T whole body MRI/MRS system, a MEG system, and a cyclotron. The acquisition of a wide bore PET/CT scanner will complement this existing equipment array and will greatly enhance the success of CCTSI translational research projects.

Scientific staff collaborating on this endeavor include individuals at the AMC, faculty and professional staff at CU who have numerous joint research appointments and co-manage research projects within the scientific community in Colorado. The PET/CT scanner will contribute education, training, research, community service and outreach activities for this group. CTRIC is affiliated with several individuals in the region, including staff at the University of Colorado Hospital, The Children's Hospital, Veterans Affairs Medical Center, National Jewish Health Center and Denver Health Medical Center, NIST in Boulder, Radiology CSU at Ft. Collins, Bioengineering at UC Denver, Mechanical Engineering at UC Boulder, Radiation Oncology at UC Denver, Anesthesiology at UC Denver and the University of Colorado Cancer Center. CTRIC also has an external Advisory Board consisting of individuals from Methodist Imaging Center, Stanford University, San Francisco VA at UCSF, UC San Diego, and Emory.

b. Existing Facility

Support services for the PET/CT scanner will be housed in Building 400 on the Anschutz Medical Campus. This facility already supports an MRI unit. Supporting services include a waiting and reception area, rest rooms, changing rooms, lockers, utility rooms, and storage. Building 400 is one of the original barrack facilities. It was constructed in 1940, acquired from the US Army, and retrofitted in 1997 to support research needs of the Anschutz Medical
University of Colorado Anschutz Medical Campus

PROGRAM PLAN FOR THE CTRIC PET/CT SCANNER

Campus. The Facilities Audit Index Summary Report indicates a facilities condition index of 68.9%; the report is included in the Appendices.

c. Changing Factors & Needs

PET scanning and CT scanning are both well established standard imaging tools that allow researchers and physicians to pinpoint the location of cancerous tumors in the body. PET scans capture images of miniscule changes to the body’s metabolism caused by abnormal cells. CT scans pinpoint the exact location, size, and shape of diseased tissue. Combining the two modalities in the same examination creates a greater body of knowledge as well as coordinated interpretive results. Combined PET/CT scanning is well suited to determining extent of disease, determining disease location for subsequent procedures, assessing response to and effectiveness of treatments, detecting residual or recurrent disease, and as a non-invasive technique which may replace an alternate invasive research approach. PET/CT scans are particularly suited to research on tumors including breast, esophageal, cervical, melanoma, lung, colorectal, head and neck, and ovarian cancers. Obtaining a PET/CT scanner is essential to keeping AMC researchers at the forefront of research opportunities that rely on research imaging.

Future CTRIC development includes planning for a CRTIC imaging center in a new AMC facility envisioned to be constructed between the existing Research 2 facility and a future Research 3 facility. Existing research imaging equipment, including the proposed PET/CT scanner, can be consolidated into this future research imaging facility. An additional research tool to be considered in the future is a PET/MRI scanner.

d. Economic Impact

Although difficult to quantify at this time, installation and operation of a PET/CT Scanner by the CTRIC program will result in opportunities for research grants and enhanced opportunities for research faculty recruitment.

The proposal to purchase a PET/CT will significantly advance biomedical research by combining sophisticated CT imaging technology with the expanding capabilities of molecular imaging provided by PET into a single instrument. The PET/CT scanner will improve AMC’s ability to predict, follow, and treat disease across a range of disciplines including neuroscience, cardiology, oncology, and metabolism. This proposal will have a major impact on job retention and creation in the Colorado region by fueling infrastructure, generating grants, stimulating biotechnology, and expanding educational opportunity. Colorado’s biotechnology sector is burgeoning, and the AMC plays a major role in its development. This dynamic, interdisciplinary field relies on the expertise and collaboration of biologists, chemists, biochemists, medical doctors, engineers and others striving to solve age-old and emerging human health challenges. Philips Healthcare incorporates Green technology into their products, striving to reduce energy consumption.
e. **Consistency with Institutional Mission**

The campus mission statement states: "UC Denver is a diverse teaching and learning community that creates, discovers, and applies knowledge to improve the health and well-being of Colorado and the world." The CTRIC PET/CT scanner supports the institutional mission by expanding its research capabilities through the acquisition of this important state-of-the-art piece of research and clinical medical equipment which will encourage significant research results from studies that CTRIC researchers will soon be able to perform.

f. **Consistency with Strategic Plan**

The consistency of acquisition of a PET/CT Scanner with the UC Denver Strategic Plan is discussed above in the section on Goals and Objectives.

g. **Consistency with Master Plan**

The acquisition of a PET/CT Scanner is consistent with the UC Denver institutional master plan entitled "UCHSC Institutional Master Plan" approved by CCHE in 1998 and the subsequent Institutional Master Plan Updates in 1999, 2000, 2001, and 2002 which were approved by the Board of Regents. The 2002 supplement was approved by CCHE. Implementing this program plan will promote UC Denver’s mission of education, research, and service with particular reference to the creation, discovery, and application of knowledge to improve health.

**D. Facilities Response**

a. **Project Description**

CTRIC plans to purchase a Philips PET/CT scanner and locate it in a permanently installed mobile unit adjacent to Building 400 on the Anschutz Medical Campus. Building 400 is a small research facility on the AMC. It already has attached to it two other high technology pieces of equipment; one is an MRI unit, and the other is a high altitude chamber. Building 400 houses support facilities for these two modalities.

Members of CTRIC and other AMC researchers evaluated PET/CT proposals from three vendors (Philips, Siemens, and GE), and determined that the proposal from Philips was the best choice based on capabilities, value, serviceability, and price. This complex piece of diagnostic imaging equipment will be delivered in a mobile trailer which will continue to house the unit in its permanent installation next to Building 400. The mobile unit will sit atop a new concrete pad.
An enclosed corridor will be constructed connecting Building 400 to the mobile unit housing the PET/CT scanner. A concept sketch and a site detail drawing are included in the Appendices.

The mobile trailer contains approximately 400 square feet with outside dimensions of 48' by 8'6". The new connecting corridor will contain approximately 350 square feet.

Building 400 contains existing services that will serve the research participants and staff operating the PET/CT scanner. The services include ADA compliant accessibility, a waiting and reception area, rest rooms, lockers and changing areas, supply and storage areas, and staff work areas. These areas will be shared with study participants and staff currently associated with the MRI which is also installed adjacent to and connected to Building 400. No changes are anticipated to these areas.

There are no spaces to be backfilled as this is a new program.

b. Master Plan Relationship

The proposed site of the PET/CT scanner, adjacent to Building 400, is in the research zone of the Anschutz Medical Campus. It is proximate to the other research buildings (Research 1 and Research 2) and other research faculty offices in the campus research zone. The proposed scanner site is envisioned in the campus master plan to be the site of another research tower. However, before that site is needed for the new research tower, a research imaging center will be constructed to house the PET/CT scanner and other research imaging equipment.

c. Site

The site is a level site appropriate for installing a mobile unit on a permanent basis. There should be no impediment to the installation of a concrete pad upon which the mobile unit will rest. The small square footage of the mobile unit and connecting corridor will not impact area drainage. The existing MRI unit and building configuration serve to visually screen the unit from most directions.

Parking is adjacent to Building 400 on its south and west sides.

d. Construction

A wood frame corridor of approximately 350 gsf will connect the existing corridor extending from Building 400 to the PET/CT mobile unit. The floor layout of the corridor will match the elevations of the two facilities. ADA accessibility to the mobile unit will be provided through Building 400. The corridor will be climate controlled. The exterior of the corridor will be clad in stucco to match the exterior of Building 400.
e. Utilities

A new 200 amp service will be run to Building 400 to serve the PET/CT scanner. A concept sketch in the Appendices depicts the location of a new power feed from the east side of Building 400, through Building 400, and to the PET/CT unit, a run of approximately 300’. The transformer on Building 400 will be upsized from 300 KVA to 500 KVA. Telephone service will be run from Building 400. No other utilities are required to serve the mobile unit.

f. Sustainability

A mobile trailer does not qualify for LEED certification. The only new construction is the new small connecting corridor. As such, this project is not appropriate for LEED certification.

E. Implementation Information

a. Project Budget

The total project cost is estimated at $2,578,010. The project cost is largely made up of the equipment cost of $2,382,000 for the PET/CT scanner and the mobile unit in which it is housed. The remaining costs include the design and construction of a connecting corridor from Building 400 to the mobile unit, site costs associated with the concrete pad upon which the mobile unit will sit, and contingency. The project costs are listed in the following table:

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<tbody>
<tr>
<td><strong>Professional Services</strong></td>
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<tr>
<td>Site surveys, Investigations, Reports</td>
<td>$5,000</td>
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<tr>
<td>Architectural/Engineering</td>
<td>$24,010</td>
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<tr>
<td><strong>Total</strong></td>
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<tr>
<td><strong>Construction</strong></td>
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<tr>
<td>New Construction</td>
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<tr>
<td><strong>Total</strong></td>
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<tr>
<td><strong>Equipment &amp; Furnishings</strong></td>
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<tr>
<td>Equipment</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
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</tr>
<tr>
<td><strong>Total Project Cost</strong></td>
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<tr>
<td><strong>Project Contingency</strong></td>
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<tr>
<td>Contingency</td>
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<tr>
<td><strong>Total</strong></td>
<td>$15,000</td>
</tr>
<tr>
<td><strong>Total Budget</strong></td>
<td>$2,578,010</td>
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b. Funding Sources

The funding sources for the $2,578,010 project are as follows:

<table>
<thead>
<tr>
<th>Amount</th>
<th>Source</th>
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<tr>
<td>$2,000,000</td>
<td>NIH-NCRR CTSA Federal Grant Funds</td>
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<tr>
<td>578,010</td>
<td>University of Colorado School of Medicine</td>
</tr>
<tr>
<td>$2,578,010</td>
<td>Total</td>
</tr>
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The $2 million is part of a NIH-NCRR CTSA federal grant which was awarded to CCTSI in May 2008. The CTSA grant provides $14.4 million in total cost to support clinical and translational science endeavors at AMC and its clinical affiliates including the University of Colorado Boulder. The School of Medicine is providing Academic Enrichment Funds (AEFs) to cover the remainder of the project budget ($578,010).

c. Scheduling

The project schedule includes the following phases (all to occur in 2011):

- **Design:** March 1-April 12
- **Equipment Manufacturing/ Site Prep/Construction:** April 12-July 31
- **Equipment Testing/License and Certification:** August 1-August 31
- **Initiate CT/PET Imaging:** September 1

It is important to note that ordering the equipment by April 30, 2011 is a condition of the NIH-NCRR CTSA grant.

d. Operating Costs

Operating costs of CRTIC are funded by CCTSI, the School of Medicine, and the Cancer Center. CRTIC aims to form a confederation of the currently existing separate research imaging and microscopy entities within the University of Colorado to achieve a more efficient, centrally administered imaging core. The CCTSI contributes $225,000 annually to the operation of three of the entities that will be involved in CRTIC. Additional annual operating costs related to this project are for staff and other operating costs which are estimated annually at $104,000 and $200,000 respectively.

e. 3rd Party Review

This program plan was reviewed by the design firm of Architectural Workshop of Denver, Colorado. Their 3rd party review letter is found in the Appendix.
Appendices

Description & Background - Colorado Clinical and Translational Sciences Institute
Site Plan
Site Plan- Detail
Concept Sketch
Facilities Audit Index Report (Building 400)
Acknowledgements
3rd Party Review Letter
APPENDICES

Description & Background
Colorado Clinical and Translational Sciences Institute

The Colorado Clinical and Translational Sciences Institute (CCTSI) was established in 2008 with funding from the Clinical and Translational Science Award (CTSA) initiative of the National Institutes of Health (NIH). It is a collaborative project organized to transform existing clinical and translational research and training efforts into a shared research enterprise. The mission of the CCTSI is to improve health and reduce health disparities in the state of Colorado by accelerating the translation of discoveries into prevention and treatments and by training the next generation of clinical and translational investigators.

The CCTSI is a formal Institute within the University of Colorado, based at University of Colorado Denver. An Executive Committee, chaired by the CCTSI Director and Principal Investigator (Ronald J. Sokol, MD), oversees operations and reports to the Vice Chancellors for Research and for Health Affairs of UCD, who in turn report to the Chancellor of UCD. The CCTSI involves the six health professional schools and colleges located at the Anschutz Medical Campus; the Colleges of Engineering and Applied Science, Liberal Arts and Science, and the School of Education and Human Development of UC Denver; and the Colleges of Arts and Sciences and of Engineering and Applied Science at University of Colorado - Boulder. Affiliated institutions include six local hospitals and health care organizations: University of Colorado Hospital (UCH), The Children’s Hospital (TCH), Denver Health (DH), National Jewish Health (NJH), Denver Veterans Affairs Medical Center (DVAMC), and Kaiser Permanente of Colorado. Faculty, trainees and research staff at any of these institutions may become CCTSI members to access CCTSI resources. Through the CCTSI’s Partnership of Academicians and Communities for Translation (PACT), it has 18 established Community-Academic partnerships throughout Colorado, involving diverse populations all over the state. This network of universities, hospitals, and the communities they serve have successfully promoted excellence in health care professional training and cutting-edge research programs for the past 30 years. Investigators from all areas of biomedical and health services research use the CCTSI to access resources for innovative interdisciplinary research and clinical and translational sciences training.

The CCTSI is one of the 55 medical research institutions working together as a national consortium to improve the way biomedical research is conducted across the country. The consortium, funded through CTSA awards, shares a common vision to reduce the time it takes for laboratory discoveries to become treatments for patients, and to engage communities in clinical research efforts. It also is fulfilling the critical need to train a new generation of clinical researchers. The CTSA program is led by the National Center for Research Resources, part of National Institutes of Health. CCTSI principals (the Director, the Co-Directors, Administrators,
and CCTSI program leaders) participate in the consortium through national committees for each component.

**University of Colorado Denver, a leader in health sciences research,** is the only Academic Health Center in Colorado. UCD has attracted more than $380 million in sponsored research, and has the highest rate of NIH funding of all Colorado universities. The Leprino Building on the Anschutz Medical Campus houses the CCTSI administrative core and many of its clinical research resources; the Institute's resources are distributed across the schools, campuses, and affiliated hospital that is serves. There are Clinical Translational Research Centers (CTRCs) providing inpatient and outpatient clinical research resources at UCH, TCH, NJH, and CU-Boulder; contact points at each hospital; and programs located across the Anschutz Medical Campus, downtown campus, and the hospitals.

The Anschutz Medical Campus (formerly Fitzsimons Army Medical Center) brings together on the same campus for the first time three hospitals (UCH, TCH, and, in 2012, DVAMC) and new educational, administrative and research facilities for all six health science schools of UC Denver. The 7.411 million ft² of research and education facilities has benefited from $2.1 billion of investments to date, and will ultimately attract more than $4 billion in facility-related funds. It is the largest academic health center between Chicago, Texas and the West Coast and the only completely new education, research and patient care facility in the nation today. The 227 acre campus provides adjacencies of clinical, educational and research facilities all within walking distance of each other, building a new culture of collaboration among clinicians, investigators and educators that invigorates research. An adjacent biotechnology park helps facilitate close collaboration between University investigators, industry and the private sector.

In a comprehensive and unique **Community Engagement and Research Program**, the CCTSI is extending and integrating community-based participatory research (CBPR) into programs that engage the wider community with research into the causes and remedies of health disparities in Colorado and the nation. It has built on a rich history of practice-based and community-based research in the state, which now includes 18 established community-academic partnerships. These partner communities include rural and urban populations, American Indian and Alaska Native, Hispanic and African American groups, providing a unique opportunity for culturally proficient research emphasizing health disparities. The innovative Partnership of Academicians and Communities for Translation (PACT) brings academic/community partnerships into a sustainable and collaborative group for bidirectional exchange, fostering public trust in the research enterprise.

The CCTSI's **Child and Maternal Health (CMH) Program** is a clinical-translational research program focused on lifespan research. Because much of chronic disease is programmed during the period of life from conception through childhood, preemptive interventions are likely to have the widest impact if initiated during these periods. CMH provides specific support for multidisciplinary, integrated, translational research focused on health problems that begin early in life and during childhood. The research initiative in CMH addresses the life trajectory of the mother and child, initiating new collaborations among basic, clinical, and
translational scientists in multiple disciplines and for providing a streamlined infrastructure for longitudinal studies to accommodate lifespan research.

The CCTSI provides research resources for basic and clinical researchers to promote translational research (bench-to-bedside or T1 research). The Participant and Clinical Interactions Resource (PCIR) is a network of four Clinical Translational Research Centers (CTRCs) providing inpatient and outpatient research facilities. The CCTSI's CTRCs have their foundation in the enormously effective Adult and Pediatric GCRC facilities, which were continuously funded for 46 and 45 years, respectively, before the NIH transitioned the GCRC grant program to its CTSA initiative. The CTRCs are state-of-the-art, clinical research facilities at UCH, TCH, NJH, and UC-Boulder. The CTRCs provide resources for all phases of clinical trial development, critical care, and expanded multidisciplinary coordinated clinical research, including a metabolic kitchen, exercise research laboratory, core laboratories, and research nurses, bionutritionists and staff to assist investigators in conducting research protocols under controlled conditions.

CTRC Core Laboratories support approved clinical research protocols with a wide range of sophisticated analytical testing, including chemical and immunological assays, flow cytometry, clinical molecular genetics tests, behavioral medicine assays, and integrative physiology testing. Core lab assays are intended to complement assays undertaken in the investigator's own laboratory and those that are neither available in the hospital clinical laboratory nor conveniently available elsewhere.

The Translational Informatics function of the CCTSI develops research informatics tools and provides training and support for research informatics needs. The Data Management team has implemented REDCap, a web-based, HIPAA-compliant study data management solution that is straightforward and robust and being adopted widely by members of the national CTSA consortium. Through SeDLAC (Secondary Database Library and Analysis Center), CCTSI members have access to large national population-based datasets from NCVS and AHRQ. The Informatics Research team provides access to the data and study design consultation. The System Services team maintains approximately 20 servers running several applications, at the department and enterprise level, for data management needs across the CCTSI. In addition, System Services manages backups, security, networking, access controls, desktop support for the CCTSI administration core and CTRCs, and CCTSI website development.

The CCTSI has a Network of Translational Technologies (NeTT) giving investigators access to biomedical technology cores and resources. The NeTT comprises 12 cores, including Biobanking resources (sample handling and storage, computerized cataloging); Gene Expression & Microarray Analysis; Metabolomics; a Proteomics Consortium (3 proteomics cores at UCD, NJH, and UC-Boulder with non-overlapping expertise); a Medicinal Chemistry Core Facility; Translational Therapeutics & Modeling (Gene-Targeted Vector Generation and Transgenic Animal Support); and an Imaging Consortium (sophisticated Microscopy, Experimental Human Imaging, and Small Animal Imaging).
The CCTSI offers outstanding training and career development programs for clinical-translational researchers at all levels. Education, Training and Career Development (ETCD) integrates educational programs at UCD and its partners, with skills-training programs in strategic areas. Programs are intended to promote collaborations leading to research with broad implications for public health. The ETCD encompasses a TL1 (pre-doctoral) program funding 8 PhD students each year; a KL2 (mentored junior faculty) Research Scholar program funding 7 junior faculty; a Clinical Sciences Graduate Program, one of the first in the country, that awards MS and PhD degrees in Clinical Investigation, Health Services Research, or Health Information Technology tracks; a Clinical Faculty Scholars Program for developing junior faculty research independence in health services research; a year-long recurring Leadership in Team Sciences (LITeS) program for mid-level and senior faculty; Clinical Trials Training for Investigators and Coordinators; a seminar series aimed at career development for K-level awardees; a seminar series on making the most of CCTSI resources; summer research and education programs for undergraduates and other students (focusing on underserved minorities); a K to R Transition Program using mock study section pre-review of first R-level grants to be submitted by K-awardees; a mentor and mentee training program; and a new Comparative Effectiveness Research Scholar program supported by an AHRQ K12 grant;

Through the Biostatistics, Epidemiology, and Research Design (BERD) Core, CCTSI members collaborate and consult with biostatisticians who can assist with study design and biostatistical analysis. BERD provides innovative training programs in biostatistics for non-statisticians. Similarly, the Regulatory Knowledge and Support Core (RKSC) helps CCTSI members navigate through regulatory requirements and training in the responsible conduct of research, while ensuring protection of research participant safety through the Research Subject Advocate program.

The CCTSI provides pilot funding in support of clinical and translational research through its CO-Pilot funding program. In 2010, 39 researchers received one-year pilot awards from this program, totaling more than $1.4 million. Some funding is specifically designated for Community Engagement Research and for Child and Maternal Health related projects. Novel Clinical and Translational Methodologies provides a mechanism to both identify novel methods needs and facilitate and fund their development.

The CCTSI website (http://ctsi.ucdenver.edu) provides the portal of entry for access to services and resources, applications, RFAs, training and announcements. The website receives over 5200 visits per month accessing over 17,600 page views. Membership in the CCTSI is required to utilize services and training programs, with membership exceeding 1,850 in 2010. Membership is available to faculty, trainees, research associates, community members and the private and public sectors. A new interface with Industry is under development in cooperation with the Technology Transfer Office of UC. A new Navigator program has been initiated to assist investigators, trainees and others in finding resources and collaborators, to assist with iRB submission and to field questions about CCTSI and University resources.
Program Plan
Building 400 and Proposed PET/CT Scanner Mobile Unit
Anschutz Medical Campus
Site Plan- Detail
Building 400 and Proposed PET/CT Scanner Mobile Unit
Anschutz Medical Campus
Concept Sketch

Building 400 With PET/CT Scanner

Red Line Indicates New Power Feed
Facilities Audit Summary Report

**Building Name:** Bldg 400  
**Campus/Location:** Anschutz Medical Campus  
**Occupancy Type:** office  
**Gross Space (sq ft):** 29,346  

**Number of Levels:** 2  
**Year Built:** 1940  
**Year Remodeled:** 1997  
**Date Inspected:** 2009  

**Building Estimated Current Replacement Value (C.R.V.):** $3,726,942

**Summary: Assessment Rating & Deficiency Cost**

<table>
<thead>
<tr>
<th>Building Component</th>
<th>System Deficiency Rating</th>
<th>Building Component Multiplier</th>
<th>Component Value (C.R.V.)</th>
<th>Estimated Cost of Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Structure</td>
<td>66%</td>
<td>0.31</td>
<td>1,490,777</td>
<td>482,266</td>
</tr>
<tr>
<td>HVAC Systems</td>
<td>68%</td>
<td>0.40</td>
<td>260,886</td>
<td>84,397</td>
</tr>
<tr>
<td>Plumbing Systems</td>
<td>67%</td>
<td>0.07</td>
<td>559,041</td>
<td>153,177</td>
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<tr>
<td>Electrical Systems</td>
<td>72%</td>
<td>0.15</td>
<td>2,911,650</td>
<td>941,919</td>
</tr>
<tr>
<td>Code Compliance &amp; Safety</td>
<td>83%</td>
<td>0.07</td>
<td>260,886</td>
<td>45,655</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td><strong>1,158,315</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Facilities Condition Index**  
\[ \text{F.C.I.} = \frac{\text{Cost of Deficiency}}{\text{C.R.V.}} \times 100 = \text{F.C.I.} \]

\[
\text{F.C.I.} = \frac{1,158,315}{3,726,942} = 68.9\% 
\]

**Percent Change from Previous = n/a %**

**Primary Critical Need:**

To achieve the greatest impact, define the Building Component that will be emphasized

- Exterior improvements and plumbing
Acknowledgements

The following individuals were instrumental in completing this program plan:

Gary D. Fullerton, PhD, Professor, Vice Chair Radiology

Peter M. Smith-Jones, PhD, Professor Radiology

David E. Miller, PhD, Associate Professor Radiology

Tim Lockie, MS MBA, Administrative Director CCTSI

Rebecca J. Leek, Research Administrator, CTRIC
January 31, 2011

Mr. Brad Silsby  
Office of Institutional Planning  
University of Colorado at Denver Health Science Center  
1945 North Wheeling Street / MS # 418  
Aurora, Colorado 80045  

Re: Third Party Review  
CTRIC PET/CT Scanner  

Dear Mr. Silsby,

We have reviewed the Program Planning document for CTRIC PET/CT Scanner prepared by your office dated January 31, 2011. The Document was prepared and follows the program planning guidelines as outlined per State Statutory Authority C.R.S. 23-1-106. It is our opinion that the Programming Plan is well executed and we find no objections to the proposed plan. The Programming document thoroughly lays out the goals of the School of Medicine and Colorado Translational Research Imaging Center (CTRIC) and their desire to further their research imaging capabilities through the purchase of a PET/CT Scanner. This follows the recommended plan by Intra campus consultations for the addition of a human research PET/CT scanner. The program plan proposes the incorporation of a modular building that will be adjacent to Building 400 on the Anschutz Medical Campus. Building 400 will provide all of the support services such as reception and waiting, restrooms, changing area, lockers, utility rooms and storage. It is proposed that an ADA compliant covered walk way will be provided between the modular building and Building 400. Below please find our observations and thoughts for your consideration during the implementation of the Program Plan.

Health/Life Safety  
After a brief review of the facilities, it is our opinion that Building 400 currently meets the code requirements of the IBC 2006 and ANSI A117.1-2003. It is imperative that the modular building and all of the access to the building meet the same codes as above. Per the program plan, the connecting corridor between the modular building and Building 400 must be enclosed and conditioned. Per IBC 2006, Chapter 11, Accessibility; if the modular building is dependent on Building 400 for the accessible services, the connection must be enclosed and conditioned. All other services connected with staff and patients must also meet the accessible requirement as outlined above.

Spatial Relationships \ Programming  
The diagrammatic plans have been thoroughly investigated and are well though out. The location is appropriate for the use and is in the same proximity as the existing other two modular support buildings.