RESOURCES AND ENVIRONMENT

The Center for Clinical and Translational Science and Training (CCTST) was established in 2005 as the University of Cincinnati (UC) academic home for clinical and translational research, providing “one-stop shopping” for investigators across the academic health center (AHC) and beyond in need of guidance, information, support, resources and training. The CCTST spearheaded the AHC’s submission of an NIH Clinical and Translational Science Award (CTSA) application, which in April 2009 received funding of $22.8 million over 5 years. Following a one-year extension, the National Center for Advancing Translational Sciences (NCATS) granted the CCTST a 4-year, $16.7 million renewal in August 2015. UC and its partner institutions Cincinnati Children’s Hospital Medical Center (CCHMC), UC Health, and Cincinnati Veteran Affairs Medical Center (VAMC) comprise the 39th member of the CTSA Consortium, which now includes over 50 sites. Its offices are centrally located in the CCHMC “Location S” research building, directly across the street from the UC Medical Sciences Building (MSB).

Investigators request methodologist consultation services through the CCTST’s online “Research Central” portal at http://cctst.uc.edu and may qualify for a renewable voucher for more intensive support, described in the Biostatistics, Epidemiology and Research Design (BERD) section below. The CCTST website also features service descriptions, a searchable database of intramural funding opportunities, events archive, news, and a comprehensive AHC calendar of on-campus workshops, conferences and lectures of interest to clinical/translational researchers. Faculty and community members can establish free CCTST membership online, required to obtain access to consultation services through Research Central as well as special funding, training and networking opportunities. In return, members help promote CCTST goals and services, collaborate and share expertise with fellow researchers, cite CCTST assistance in publications as appropriate, and provide information for surveys and reports. To date, over 4,600 members have joined the CCTST, including over 400 community representatives.

The CCTST has promoted multi-disciplinary collaboration through Integration Committee consultations and topic-based studios, and by making multi-disciplinary teams a funding priority in CCTST grant programs. Since its inception in January 2013, the Committee has met with over 115 faculty and investigators/groups from across the AHC, UC undergraduate campus and the community to help define solutions for problems encountered during the course of their research efforts. One of the major strengths of the program is its longitudinal nature, which ensures that faculty on the Integration Committee serve as the “primary care doctor” for the participant, with frequent follow-up to ensure that solutions to any encountered obstacles can be developed and to encourage progress on projects and career development. There is interest at the UC leadership level to develop this program across the university and extend to the Colleges on the undergraduate campus (Engineering; Design, Art, Architecture and Planning; Arts and Sciences; Education and Criminal Justice).

The CTSA funding renewal included support for 2 optional modules which will advance clinical and translational research across the AHC:

- **Acute Care Research Module.** The Acute Care Research Module has been developed to encourage and support studies specifically related to research in the acute care setting. Acute Care Research (ACR) is defined as research that occurs within 24 hours of a visit to an emergency department or an unscheduled admission, or within 24 hours of identification of a new or worsening condition - characterized by sudden onset requiring immediate care. ACR is challenged by the need to interface with patients 24/7, within minutes to hours of their illness or injury, which brings unique regulatory concerns and institutional obstacles that must be overcome. From 2016-2018, the ACR Module was awarded 112 grants for acute care research trials and 360 manuscripts were published that enrolled patients in ACR. To direct the work of the ACR Module, the CCTST created an Acute Care Research Council (ACRC), consisting of senior investigators conducting research in acute care settings across the AHC, including UC, CCHMC, VAMC, and the community. Partnership is also extended to representatives from vital infrastructure including the local Institutional Review Board and investigative pharmacy. The ACRC holds regular meetings and hosts seminars that highlight cutting edge research in acute care, attracting multispecialty abstracts and national leaders. The ACRC is currently undertaking a multidisciplinary CCTST-funded study regarding capacity for consent in ACR settings.
and is developing several manuscripts for publication. Additionally, the ACRC has developed and vetted Core Competencies for ACR professionals. Resources are available for acute care research team members, including regulatory staff, clinical research coordinators and investigators.

- **Lifespan Data Integration Module.** The Lifespan Data Integration Module serves as a core resource for maternal and child health providers, policy-makers, epidemiologists, and community agencies—ultimately, any stakeholder in maternal and infant health. The Lifespan Data Integration Module seeks to catalyze perinatal research efforts through engagement of additional multidisciplinary teams, both within and external to the CCTST community. This module focuses on local efforts to improve maternal health before and during pregnancy, discovers mechanisms to prevent prematurity and reduce intrauterine exposures to substances of abuse or other harmful environmental exposures, and tracks infant outcomes and healthcare utilization after birth. CCHMC and the UC Medical Center have an accomplished record of leading multidisciplinary research, as well as place-based collaborations focusing on improving perinatal health, including with the March of Dimes Ohio Collaborative, Cradle Cincinnati, and Start Strong-Avondale.

With CTSA and institutional funding, the CCTST provides resources in the major program areas described below:

1) **Center for Improvement Science (CIS).** The CIS aims to transform the institutional research culture by removing barriers to cross-disciplinary research and increase innovative and impactful translational research through the application of team science (TS) principles and collaboration. From 2016 – July 2019, the CIS has provided services (education, consultation, facilitation, and evaluation) to over 1,400 investigators and produced 95 independent events. The CIS has taken steps to be a focal point at the AHC and spearheaded the implementation of a comprehensive, tiered education program on team science principles for everyone involved in research. This includes the initiation of a series of workshops, in collaboration with UC Office of Research, to help investigators be more effective in teams. The workshops have been implemented as a course within the MS in Clinical and Translational Research related to the science of team science.

The CIS developed The Collaboration Network (TCN) to overcome geographical, institutional, and disciplinary barriers to connecting with colleagues with complimentary interests. TCN is a growing group of investigators, clinicians, service providers and other innovators who meet to learn about each other, available resources, and funding opportunities. One activity that the TCN spearheads is quarterly virtual meetings focused on topics of significant complexity that would benefit greatly from collaboration across diverse disciplines. TCN has hosted two virtual meetings in 2019; one on the topic of aging and the second on the topic of social determinants of health. TCN has 105 official members and 62 affiliates who still participate regularly in activities related to one of the two TCN featured health topics. TCN is working with over 150 researchers, educators, health care providers, and other innovators to support collaboration on grant initiatives and other projects. CIS will expand this model to create other networks and in the future plans to connect the networks to each other. Teleconferencing technology allows CIS to overcome distance barriers while maintaining the features of face-to-face connectivity.

2) **Pilot Translational and Clinical Studies (PTCS).** The CCTST offers three pilot funding mechanisms: Pilot Translational Research and Innovative Core grants, Just in Time (JIT) grants, and Processes and Methods grants. Since inception of CCTST funding (2009), the PTCS has awarded 532 grants to investigators at UC and CCHMC, totaling over $10 million in awards.

There are three specific grant types within the Pilot Translational Research and Innovative Core grants program: Translational Research Grant (TRG), Mentored Translational Research Grant (MTRG), and Innovative Core Grant (ICG). The TRG supports established investigators seeking to conduct novel translational research. To focus on promoting mentored research by new investigators, mentees and mentors are paired in the MTRG to promote research education and help ensure career development. The ICG helps build adequate local infrastructure to support clinical and translational research by providing funds to establish new shared Core facilities with a clear translational focus. In FY19, this program awarded 8 grants (6-TRG, 2-MTRG) totaling $479,954.
The mission of the JIT grant program is to enable investigators to use UC or CCHMC Core facilities to obtain critical data for submission of a competitive extramural proposal, patent application, or commercialization agreement. In FY19, the JIT grant program awarded 9 grants totaling $66,598.

The Processes and Methods grant program, a collaboration between PTCS, Biostatistics, Epidemiology and Research Design (BERD), and Ethics, Regulatory Knowledge and Support (ERKS), enables investigators at all levels to explore ways to improve the efficiency and effectiveness of the processes and methods used in clinical and translational research. In FY19, the Processes and Methods grant program awarded 5 grants totaling $60,000.

3) Biostatistics, Epidemiology and Research Design (BERD). BERD provides services to CCTST investigators, ranging from advice on study design, grant application development, data management, and data analysis to career development support. BERD effectively interfaces with other CCTST programs and has served to generate methodologic research to advance CTR. Methodologic advice, data management, and statistical analysis have been coordinated through Research Central, a web-based, campus-wide hub that has become the “go-to” place to find expertise and collaborators. BERD implemented an investigator support system, in which CCTST members are granted a one-hour session with a “concierge” methodologist (assessment and guidance), senior statistician (statistical analysis or planning), or data management expert (data acquisition and management) to provide high-level advice. Investigators who need additional assistance are invited to apply for CCTST-supported vouchers; or, if not eligible, are routed to other resources. BERD’s focus is to assist all CCTST investigators in developing successful grant applications, particularly promising junior investigators navigating the K-to-R transition. BERD has strengthened communication with AHC researchers, making presentations at research faculty meetings. As of July 2019, the BERD program has supported 343 investigators in 61 academic units of five UC colleges. 113 vouchers have been awarded; 19 went to investigators with K awards, and 64 have led to extramural grant applications. Currently, 18 have been awarded a total of $22 million (ROI 19.1). BERD methodologists are included in these applications as co-investigators.

BERD faculty run seminars and special interest groups for methodologists; organize the CCTST Grand Rounds series; teach in the Master of Science in Clinical and Translational Research (MSCTR) program; mentor KL2 Scholars; provide methodologic expertise to all KL2 and CT2 Scholars and institutionally-funded K Scholars, both through the K Scholars peer mentoring group meetings and through access to vouchers; provide methodologic expertise to CCTST grant programs, such as the CCTST Pilot Translational and Clinical Studies Grant Program and the Processes and Methods grants.

4) Biomedical Informatics Services (BMI). BMI offers resources and services to nearly all biomedically-inclined investigators both at CCHMC and the UC College of Medicine, through three closely integrated Shared Facilities, each with a faculty advisor and day-to-day operational staff lead. Together, these groups comprise over 80 personnel. A fourth facility to provide collaborative bioinformatics services that consolidates a number of disparate existing groups was initiated in September 2018 with the naming of a Director and Faculty Advisor. CCHMC Research IT operates independently from—and maintains a computational architecture distinct from—CCHMC Hospital IS. However, the two groups have a long history of tightly coordinated cooperation to support research, with a highly granular matrix of responsibilities, and shared use of network, data security, and policy/procedural infrastructures.

BMI’s Technology Development group is a faculty-supported collaborative service and development unit with expertise in a number of different areas that operates across CCHMC and UC. The ~25 staff include experts in web- and mobile-based software development, networking, system administration and maintenance, and database programming. Staff are accustomed to working within a unique environment that facilitates realization of complex projects with significant programming and outreach extensions. Services offered include:

- Developing customized software applications in a wide variety of programming languages, (e.g., Python, Perl, Java/J2EE, iOS, and .NET)
- Evaluating, hosting and customizing licensed and open-source research software
- Designing and hosting research databases, data marts, and registries
- Developing customized research web sites and web services compliant with industry and corporate
standards

- Hosting content management systems and web portals based on Squarespace, Confluence, SharePoint, Drupal, and WordPress.

BMI application developers have extensive experience in designing and implementing web servers for prediction and analytical methods developed in BMI investigator laboratories. In addition to interactive web-interfaces involving JavaScript, Java applets, PHP, Perl, and HTML5 graphics, the following web and computing technologies have been acquired and are frequently utilized by BMI application developers for ongoing projects: asynchronous JavaScript and XML (AJAX) client-server communication; automated queries to both local (MySQL- and SQLite-based) and external databases (with HTML, FTP, or REST interfaces); scheduling jobs on the BMI computational cluster; dynamic data analysis and visualization; automated email communication and data file exchange. BMI application developers have experience handling large user request traffic, integration of servers and databases, and creating automated workflows for data distribution and analysis. This group will lead technology development efforts for the DMCC.

BMI Data Services is a group of approximately 30 staff members who operate both at UC and CCHMC. This group specializes in complex extractions of data from the electronic health record (EHR) and other primary sources for research purposes, the transformation of these data into common data models for use in distributed research networks, and the development and implementation of standards and infrastructure to support learning health systems and other data and improvement networks. BMI Data Services oversees the development and implementation of the respective UC and CCHMC-based research data warehouses and develops data collection and reporting systems to support registries and multicenter learning networks, including serving as an honest broker and navigating investigators through compliance and data security issues. The research data warehouses are also used to support UC/CCHMC participation in several distributed data sharing networks, including the Electronic Medical Records and Genomics (eMERGE) Network, the National Patient-Centered Clinical Research Network (PCORnet) and the Accrual for Clinical Trials (ACT) Network. CCHMC was involved in three projects during PCORnet Phase 1 (SCILHS and Pedant Clinical Data Research Networks (CDRNs) and the PCORNet Patient-Powered Research Network (PPRN)), and is part of two awards in PCORnet Phase 2 (Pedant CDRN and ImproveCareNow PPRN). UC and CCHMC share a node on the ACT Network. Through these projects, staff in BMI Data Services have gained tremendous experience extracting data from the EHR and developing transformations into many of the most popular Common Data Models (CDMs), such OHDSI/OMOP, i2b2, and the PCORnet CDM. They have also gained experience with the analytical tools that are associated with each model. This group will lead data acquisition, integration, and dissemination efforts for the DMCC. In addition, the group oversees customizations of, and complex extractions into and out of REDCap systems.

5) Ethics, Regulatory Knowledge & Support (ERKS). The ERKS program coordinates the resources of multiple initiatives centrally supported by the CCTST. The program provides institutional support to facilitate ethical, compliant research. Services include assistance with protocol development, data management, FDA filings, IRB applications, consent formulation, ethics consultations, as well as regulatory science and scientific integrity training.

As national leaders in the use of central IRBs (e.g., NINDS’ StrokeNet), CCTST resources are used to develop a workflow that streamlines electronic protocol management for central/single IRBs. In 2018, ERKS reviewed 1,214 IRB protocols. The program has also developed and implemented CITi research training for those engaged in human subjects research that is utilized and accepted across the Academic Health Center and region. With the Community Engagement Core, ERKS spearheaded the development of the Consortium of Greater Cincinnati IRBs (CGCI), a subgroup of the Greater Cincinnati Health Council focused on improving the quality of research and facilitating clinical research regionally.

In 2017, ERKS initiated a course for medical sciences undergraduate students entitled Healthcare Ethics, focusing on beginning and end-of-life issues and introducing students to ethical decision-making models. ERKS has also developed courses in scientific integrity and two graduate-level regulatory science courses that form the foundation for a graduate-level Certificate. ERKS provides a variety of different training opportunities each year with topics varying based on need. This includes training on electronic submissions for investigational new drugs/device exemptions (INDs/IDEs). In 2018, CCHMC investigators submitted 24 INDs
while UC researchers submitted 18 INDs and 2 IDEs.

ERKS conducts research, teaches courses, presents seminars, and publishes templates and processes to improve the informed consent process. The program is in its third year of leading a Consent Collaborative, forming a multi-disciplinary team of researchers, ethicists, and IRB/regulatory professionals from Boston Children’s Hospital/Harvard University, Duke University/Duke Clinical Research Institute, and UC/CCHMC. The Collaborative is focused on investigating new technologies/platforms for delivering informed consent, assent, and parental permission; and exploring new approaches for measuring participant understanding of consent content. Through the CCTST, the collaborative has submitted four grant applications. ERKS hosts a biennial ethics conference that continues to grow and build local, national, and international relationships. The 2019 edition, "Pushing the Boundaries: Scientific Innovation and Biomedical Ethics" had 70 people in attendance from across the country. The ERKS’ annual Human Research Protection Conference, a collaborative effort of the CCTST, UC, CCHMC, UC Health, University of Kentucky, Advarra, and the Cincinnati Veterans Administration Medical Center (VAMC) continues to be one of the largest regional IRB conferences in the U.S. and has inspired new conferences with two other leading organizations, HHS’ Office of Human Research Protections (OHRP) and Public Responsibility in Medicine and Research (PRIM&R). To promote bioethics and provide a framework for discussion and reference ERKS has organized a Regional Bioethics Network Committee including faculty and staff from local colleges, health departments, health care systems, businesses in the region.

6) Participant and Clinical Interactions (PCI). The CCTST supports patient-oriented research through the highly successful Schubert Research Clinic (SRC). SRC staff work effectively as a team to provide high quality, innovative, cost-effective resources and services to researchers, patients, and families in a safe environment, fostering high quality clinical and translational research in the AHC and the community. The SRC is located on the first floor of the Clinical Sciences Pavilion (T Building) on the CCHMC main campus. The clinic is a welcoming and bright space conveniently located between the main hospital and the research buildings. This space brings together all services supporting clinical trials in one location, making the process of planning and conducting trials convenient for both investigator and participant. The SRC includes 28 exam rooms, one preparatory lab with equipment for processing samples, a packaging and shipping room, a metabolic kitchen, a body composition laboratory with DXA scanners, a biochemistry laboratory, and a vascular research laboratory. The Clinic can accommodate visits of less than ½ hour to greater than 10 hours and is equipped for subjects from infants to seniors. The clinic is fully staffed with highly trained and skilled nurses, medical assistants, research assistants, and registration staff to help with study visit needs. Access to the SRC is open to any clinical researcher with a current IRB-approved study. During the last year, the appointment scheduling process has been fully automated, and a facile application within Epic has been implemented to capture information regarding research visits.

The SRC Research Nursing Core also provides nursing services for inpatient and “scatterbed” studies across the AHC and into the broader community. Ten research nurses are credentialed at the UC Medical Center to assist investigators with studies at that location. SRC core services are offered in biochemistry, body composition, and bionutrition. From 2016-2018 a total of 726 studies from CCHMC (36 Clinical Divisions) and UC (14 Divisions/Departments) utilized the SRC services. From 2015-2018, there were 466 publications from studies using the SRC.

7) Community Engagement Core (CEC). The CEC is broadening and strengthening collaborations between the AHC and community. In collaboration with the James A. Anderson Center for Health Systems Excellence at CCHMC, the CEC has partnered on a Learning Health Network approach to improving community health. The Anderson Center has a broader range of stakeholders including patients, clinicians, healthcare systems, and federal agencies such as Patient-Centered Outcomes Research Institute (PCORI), National Institutes of Health (NIH), and Food and Drug Administration (FDA).

Other program-driven resources include the Community Partner Council, comprised of community members, neighborhood activists and AHC members who facilitate connections through consultation, education and action. Practice-based research networks (PBRNs) developed and supported by the program (the Cincinnati Pediatric Research Group (CPRG) and an adult PBRN, the Cincinnati Area Research Interest Group (CARInG) Network), had a total of 9 active grants, 1 pending grants, 15 presentations, and 4 publications in 2018.
The PBRNs are key stakeholder partnerships. The adult PBRN, CARInG, consists of 25 active family medicine, general internal medicine, and medicine/pediatric practices, plus Federally Qualified Health Centers (FQHCs). The pediatric PBRN, the CPRG, consists of 18 practices. The PBRNs are at the forefront of conducting research on health disparities identified by community physicians and delivery of evidence-based best practices in community settings. In 2018, the CARInG network also created two patient and family research advisory councils. The National Institute on Drug Abuse (NIDA)-funded EMPOWER (Evaluating the ability to reduce Morphine equivalent dose for chronic Pain patients receiving Opioid-therapy through a Web-based E-Health self-management program) project is an example.

The CEC has helped transform the institutional environment to value and support community engaged research (CEnR). The CEC has provided >100 consultations to help investigators, research teams, and community organizations identify partners, develop/refine research questions, use culturally-appropriate recruitment and study designs, mixed-method evaluations, and disseminate research findings to stakeholders and/or the larger community. In addition, CEnR metrics are now integrated into the UC College of Medicine (COM) Department of Pediatrics Reappointment, Promotion, and Tenure Criteria.

Since 2010, the CEC has offered the Community Leaders Institute (CLI), providing in-depth training in translational research over six weeks for community members and organization staff. The CLI has trained 180 community leaders from 103 non-profit, community-based organizations; 156 graduates from 2009-2018 have leveraged new knowledge and skills to obtain >$5.5 million in in new grants, a ROI >28:1.

The Community Health Grant (CHG) program provides up to $20,000 to support academic-community partners conducting pilot research. To date, we have awarded 65 CHGs to 56 academic-community research teams, which have impacted over 20,000 individuals, and leveraged over $7 million of external funding into community programs and organizations. In 2017, the CHG program was supplemented with a Partnership Development Grant (PDG) mechanism, which provides up to $5,000 for one year to convene stakeholders, develop a common agenda, and possibly conduct a needs assessment and/or prepare a grant proposal. Since its inception, 12 PDGs have been awarded to new or developing partnerships; progress reports indicate that these projects have had a positive impact on the health of our community, as evidence-based strategies have been developed and tested.

Established in January 2015, the AHC’s first research-focused patient and family advisory council, the Research Participant Advisory Council (RPAC), meets monthly. The 30-member council provides a platform for research participants to engage with and advise CCHMC administration, faculty, and staff on research and its conduct at the AHC. The age range of RPAC participants is 11-65 years, including children and parents/caregivers of research participants. The RPAC has staff representatives from a diverse group of work areas in both research and clinical operations at the AHC. In June 2016, a second advisory group was established in partnership with Seven Hills Neighborhood Houses to create a community-based advisory board in the West End, an urban Cincinnati neighborhood. The West End Community Research Advisory Board has 20 members from the West End community, ages 13-74 years, who have mostly not participated in research. The Advisory Board meets monthly and provides community perspective and feedback on research issues. The group is currently working on gauging their community’s familiarity and opinion of research, gaining experience in participating in research, and building their understanding of the various aspects of research. A third RPAC is being developed at UC/UC Health.

8) Translational Workforce Development (TWD). The CCTST provides clinical and translational research (CTR) training and development opportunities to a broad and diverse audience of community members, academic researchers, and students. The overarching goal of the TWD program is to provide a continuum of tailored educational resources for all stages of the CTR workforce, from investigator to community pipeline programs, to increase workforce diversity, enhance community-engaged research, and ensure the highest level of academic rigor in research. The TWD program serves as the clearing house for all CCTST training activities and is integrated across numerous cores including, BMI, CIS, Community Engagement, BERD, ACRC, ERKS and KL2. The TWD core has established a variety of activities to foster and facilitate CTR training including a CTR pipeline engagement program, formal graduate education (degree granting) programs, career development activities, and specialized, non-credit initiatives.
Pipeline engagement activities include supporting summer undergraduate research sponsorships (42 students funded via 7 programs) and a non-credit community training program (“Research 101”) tailored toward engaging community members in research activities most relevant to them; e.g., joining a research study, understanding a consent form, and privacy issues. Newly implemented Science Cafes bring researchers into community settings (coffee house, brewery, etc.) to discuss health science with the community in a relaxed environment using lay language. In 2018, we also connected with Fortis Community College in an effort to assist students interested in research career paths through job shadowing, educational opportunities, and assistance with capstone projects. We plan to expand upon this initial effort to other area community colleges. The TWD program also established and continues to support the Women in Medicine and Science (WIMS) Chapter at UC.

The CCTST TWD program developed and collaboratively administers (with the Department of Environmental Health) two Master of Science in Clinical & Translational Research (MSCTR) degree tracks - a Principal Investigator (MSCTR-PI) track and a Clinical Research Professionals (MSCTR-CRP) track. In addition, a Graduate Certificate in Clinical & Translational Research is offered. Currently, the MSCTR-PI track has over 50 students and 200 alumni, and the Certificate program has over 55 students and 160 alumni. The MSCTR-CRP track was approved in Summer 2019 with an official launch in Fall 2019.

Two future initiatives are planned to increase the reach of the TWD core. The first initiative is CTRonline, a repository of primarily online modules providing brief, non-degree credit instruction for any interested learner on specific research methodology topics, including IRB protocol development, designing a research study, statistical analysis and power calculations, and public health policy. We intend to provide these modules through the CCTST website at no cost to the user. Our second initiative is to expand our existing pipeline engagement programs with the goal of increasing training opportunities to prepare both current employees, as well as community members, to join the clinical research workforce.

9) KL2/CT2 Career Development Awards. The CCTST is home to the KL2 Career Development Award Program (https://cctst.uc.edu/funding/kl2rs/). The KL2 program provides financial support for salary and research-related expenses for up to 2 consecutive years to highly qualified junior faculty pursuing careers in clinical and translational research. During the award period, Scholars are expected to pursue their own K23 or similar individual career development awards or R series grants. The KL2 Program was initially funded in 2009, and since then, has appointed 24 Scholars (20 graduates, 4 current scholars). In 2017, the KL2 program was redesigned to address emerging challenges in Clinical and Translational Research (CTR). Changes included a renewed focus on recruitment of diverse Scholars, a broader spectrum of career development opportunities, an increase in networking opportunities between Scholars and across the CCTST, and development of a robust set of metrics to measure program success. Scholars have been very productive in terms of publications and presentations. Current and previous Scholars have published a total of 674 manuscripts since they were appointed: a mean of 28 per Scholar. All 20 (100%) graduates of the program have served as PI or co-I of an externally-funded CTR grant, and 19 of the 20 graduates of the program have transitioned to sustained careers in CTR.

The CCTST’s KL2 program is closely linked with the TWD program. As such, KL2 Scholars can easily take courses in the MSCTR program or the Certificate in Clinical and Translational Research program. To date, in order to augment the Scholars’ individual coursework, research, and mentoring experiences, 2 interdisciplinary activities have been instituted: K Club and the K Scholars peer mentoring meetings. Anyone with a career development award, or who is planning to apply for a career development award, is invited to join the K Club, an informal forum for discussing topics of interest to attendees related to research, career development, and team science. The K Scholars meetings are required peer mentoring sessions in which Scholars not only receive invaluable feedback on their current and planned research, but also learn to understand and value the perspectives of other clinical and translational researchers not in their field. The K Scholars meetings take place twice monthly.