

CTSA Program Collaborative Innovation Suite of Awards

Report for the Fall CTSA Program Meeting – October 26, 2017

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CTSA Program Collaborative Innovation Suite of Awards

The purpose of the CTSA Program Collaborative Innovation Suite of Awards is to stimulate team-based research across the CTSA Program and to disseminate discoveries across the consortium.

The CTSA Program Collaboration Innovation Award Projects (CCIA) projects receive CTSA Program funding through two funding opportunity announcements that are intended to foster investigator-initiated research collaboration by encouraging teams from three or more CTSA Program hubs to work together to develop, demonstrate and disseminate innovative, experimental approaches to overcoming translational science roadblocks.

- [PAR-15-172](#): Collaborative Innovation Award, Clinical and Translational Science Award (CTSA) Program (U01)
 - The purpose of this funding opportunity announcement (FOA) is to stimulate innovative collaborative research in the NCATS' Clinical and Translational Science Award (CTSA) consortium.
- [PAR-16-343](#): Limited Competition: Exploratory CTSA Collaborative Innovation Awards (R21)
 - The purpose of this funding opportunity announcement (FOA) is to support highly innovative, exploratory, collaborative research projects in the NCATS' Clinical and Translational Science Award (CTSA) program, with the goal of assessing utility and feasibility of proposed innovation(s).
- Applications submitted to PAR-15-172 and PAR-16-343 are evaluated for scientific and technical merit by appropriate Scientific Review Group convened by NCATS, in accordance with NIH peer review policy and procedures, using the review criteria as stated in the funding opportunity.

The CTSA Program Collaborative Innovation Award Administrative Supplements allow investigators from two or more CTSA Program hubs to form collaborations within the network and/or with external partners to implement, assess, and/or disseminate discoveries in methods, approaches, education, and training in clinical and translational science.

- [PA-16-328](#): Limited Competition: Administrative Supplements to Enhance Network Capacity: Collaborative Opportunities for the CTSA Program (Admin Supp)
- Administrative Supplements do not receive peer review. Instead, the administrative criteria are described in the funding opportunity and NIH Staff consider the ability of the proposed supplement activities to increase the overall impact of the CTSA program, and

the relevance of the proposed supplement to the NCATS mission of advancing translational sciences.

Figure 1: Comparison of the Collaborative Innovation Suite of Awards

FOA Title and URL	Mech. & Receipt Dates	DC per FY (\$000)	Max Yrs	Review Type	Council	Eligibility	Purpose
Collaborative Innovation Award, Clinical and Translational Science Award (CTSA) Program (U01) http://grants.nih.gov/grants/guide/pa-files/PA-15-172.html	U01 (PAR) 3x / year	\$500 (non-clinical) \$1,000 (clinical)	Up to 5	Peer	Rolling: 3x/year	Investigators at any CTSA Program hub or partner institution	Intended to support innovative collaborative investigations into overcoming roadblocks in translational research, at any step in the translational spectrum. Requires: Minimum of 3 or more CTSA Program sites
Limited Competition: Exploratory CTSA Collaborative Innovation Awards (R21) http://grants.nih.gov/grants/guide/pa-files/PA-16-343.html	R21 (PAR) 3x / year	\$200 (no more than \$275 total for the 2-yr project period)	Up to 2	Peer	Rolling: 3x/year	Investigators at any CTSA Program hub or partner institution	In general, the goals of this R21 program are similar to those of the U01. The main difference is that this FOA encourages highly innovative, exploratory projects, with the recognition that such projects may entail a greater failure rate. Particularly innovative, high-risk/reward projects that can be completed within a two-year time frame distinguish projects for this R21 program from the U01. Requires: Minimum of 2 or more CTSA Program sites
Limited Competition: Administrative Supplements for Enhancing Network Capacity: Collaborative Opportunities for the CTSA Program (Admin Supp) http://grants.nih.gov/grants/guide/pa-files/PA-16-328.html	Admin Supp (non-competing) (PA) 2x / year (March and November)	\$300	1 or 2	Admin	N/A	Those with eligible parent awards that have sufficient time remaining in their project period to complete the proposed work (i.e., active U54, KL2, TL1, UL1 grants through: · PAR-15-304 · RFA-TR-14-009 · RFA-TR-12-006 or · RFA-RM-10-020)	Intended to support network capacity in the CTSA Program through implementing, assessing, and/or disseminating discoveries in methods, approaches, education, and training in clinical and translational science. Requires: involvement of 2 or more CTSA Program sites and/or external partners

CTSA Program Collaboration Innovation Award Projects

The Data:

- During FY16-17, **13 grant awards** were made under [PAR-15-172](#) and [PAR-16-343](#):

RFA	Activity	FY16 Number of Grants	FY16 Total Cost	FY17 Number of Grants	FY17 Total Cost
PAR-16-343	R21	0	-	2	\$411,480
PAR-15-172	U01	7	\$8,602,736	11	\$13,990,562

- **13** primary institutions were awarded grants through PAR-15-172 and PAR-16-343
- Number of CTSA Program hubs collaborating on 13 grants: **36** distinct CTSA Program hubs

Investigating teleconsent to improve clinical research access in remote communities (R21)

Institution: MEDICAL UNIVERSITY OF SOUTH CAROLINA

Collaborating Institution: UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Principal Investigator: OBEID, JIHAD

Recruitment and enrollment of eligible research participants into clinical trials is a major challenge in most clinical settings, including informed consent at remote sites. Studies often fail to meet enrollment goals, resulting in costly time extensions, underpowered results, and in some cases early termination. Informed consent is an essential process involving trained research personnel meeting face-to-face with participants, which can be especially challenging during busy clinic schedules or recruitment at remote locations. An innovative informed consent approach that leverages telemedicine technology (teleconsent) was developed at the Medical University of South Carolina (MUSC). Teleconsent allows research personnel to: 1) meet and discuss the study with a prospective participant virtually using a video feed; 2) share an informed consent document that can be collaboratively filled out by participant and personnel in real-time; and 3) generate an electronically signed informed consent that is available for immediate download or print by both parties. The objective of this proposal is to evaluate teleconsent in real-world environments across two institutions, MUSC and the University of North Carolina at Chapel Hill. This includes the examination of ethical and privacy concerns by stakeholders and the community, and identifying barriers to adoption. The aims

are to: 1) evaluate the feasibility, ethics, and impact of teleconsent on access at remote sites including underserved communities and on informed consent comprehension; 2) assess the usability of the technology and its impact on the research workflow, both at local (coordinating center or researcher's home institution) as well as at remote locations (remote clinics or other recruitment facilities). If successful, this work will show the utility of this new technology, identify potential barriers to adoption and inform implementation in other research environments. A positive outcome should provide an avenue to improve recruitment/enrollment rates, reduce the burden associated with obtaining regulatory approval for remote sites, lower the costs of remote enrollment, and extend research into underserved areas, without negatively impacting the informed consent process.

Modulation of Gut-Brain Axis Using Fecal Microbiome Transplant Capsules in Cirrhosis (R21)

Institution: VIRGINIA COMMONWEALTH UNIVERSITY

Collaborating Institution: MEDICAL COLLEGE OF WISCONSIN

Principal Investigator: BAJAJ, JASMOHAN S

Cirrhosis and its complication, hepatic encephalopathy (HE) are one of the leading causes of morbidity and mortality in the US. HE is associated with gut dysbiosis that is usually treated with antibiotics, prebiotics or probiotics. However, however HE often continues to recur and cause readmissions despite this standard of care. Multiple episodes of HE can result in cumulative irreversible brain injury. Therefore the prevention of recurrent HE is an important unmet need that requires translational intervention. Fecal microbiota transplant (FMT) is an effective translational approach for recurrent *Clostridium difficile*. Our preliminary data suggest that a one-time administration of an FMT-enema using a rationally-selected donor via Openbiome is safe in cirrhosis and recurrent HE. However, an upper GI route is preferable for patients and could favorably impact the small intestine, where translocation often occurs. The G3 FMT capsule by Openbiome acts on the small and large intestine and is available for *C.difficile*. We will use one donor specifically selected from the Openbiome pool whose microbial profile best fulfills the microbiota deficits related to beneficial bacteria in HE patients, utilizing a "Precision Microbiome" approach. Ultimately the goal is to define oral FMT as a viable treatment approach for recurrent HE patients. Our hypothesis is that fecal transplants from a rationally derived donor delivered via capsules are safe and well tolerated in patients with cirrhosis and HE and are associated with significant improvement in gut microbiota composition, and mucosal defenses. The primary aim is: To evaluate the safety and tolerability of fecal transplant through oral capsules from a rationally derived donor in cirrhosis and HE

from a liver disease and symptom standpoint. Secondary aims are (1) To define the changes in microbiota composition of the stool, duodenal and sigmoid colonic mucosa after oral FMT compared to pre-FMT baseline (2) To determine the effect of oral FMT on mucosal defenses by studying antimicrobial peptides, inflammatory cytokine expression and barrier protein expression compared to pre-FMT baseline. (3) To evaluate changes in systemic inflammatory cytokines and endotoxin after oral FMT compared to pre-FMT baseline. This will be an open-label trial of cirrhotic patients with HE carried out in collaboration CTSA at Virginia Commonwealth University and the Medical College of Wisconsin along with Openbiome. Both CTSA have expertise in the study of the gut-liver axis and mucosal defenses respectively. This research will form the platform for large, placebo-controlled, randomized trials for efficacy in this underserved population with scientific and clinical improvements in understanding of the gut-brain axis. This proposal is responsive to PA-16-343 by involving two separate CTSA hubs and performing “Translational studies of the human microbiome” and “Precision Medicine” as a method to advance knowledge within the CTSA consortium.

Strengthening Translational Research in Diverse Enrollment (STRIDE) (U01)

Institution: UNIVERSITY OF MASSACHUSETTS MED SCH WORCESTER

Collaborating Institutions: UNIVERSITY OF ALABAMA AT BIRMINGHAM, VANDERBILT UNIVERSITY MEDICAL CENTER

Principal Investigator: LEMON, STEPHENIE C (contact); ALLISON, JEROAN J; HARRIS, PAUL A; SAAG, KENNETH G

The goal of STRIDE (Strengthening Translational Research in Diverse Enrollment) is to develop, test, and disseminate an integrated multi-level, culturally sensitive intervention to engage African Americans and Latinos in translational research. STRIDE is a partnership of the CTSA at the University of Massachusetts Medical School, the University of Alabama at Birmingham, and Vanderbilt University, three geographically diverse areas with large numbers of African American and Latino constituents. Despite disparities in leading causes of death, morbidity and disability, African Americans and Latinos are under-represented in important translational research studies that have potential to reduce these disparities. Our team's prior work suggests that limited research literacy, defined as “the capacity to obtain, process and understand basic information needed to make informed decisions about research participation,” often precludes research participation. Participant barriers also include lack of trust stemming from historical abuses. Research team members often lack skills in cultural competency and may not be sensitive to important issues faced by populations of color. Likewise, informed consent procedures contained within the research system may create

confusion and disengagement of diverse participants. The multilevel STRIDE intervention will address these barriers at three levels: patient, research team, and system. The STRIDE intervention builds from synergistic work conducted at the three participating CTSA hubs that includes patient, research staff and systems (e-Consent) targeted interventions. Collectively, our approach will enable research personnel to recruit and deliver informed consent in a culturally competent, literacy appropriate manner, while also improving the “research literacy” of potential research participants. The participant component of the STRIDE intervention will draw upon the power of narrative intervention, or “storytelling,” by harnessing powerful stories from actual research participants describing their experiences, which will be incorporated in community-based outreach forums, the e-consent platform and in clinical settings. The research team component of the STRIDE intervention centers on an innovative application of medical simulation to improve the cultural competency of those recruiting and enrolling diverse participants in translational research. The systems component of the STRIDE intervention will be based on an innovative REDCap e-Consent platform adapted for cultural sensitivity to African American and Latinos and incorporates access to ancillary tools to enhance patient understanding. The project has three Specific Aims that correspond to three study phases. In Aim 1, the comprehensive intervention will be developed and pilot tested. In Aim 2, a multi-site interrupted time series design trial will be conducted to determine the impact of the STRIDE intervention on recruitment of African American and Latino participants in ongoing clinical trials. In Aim 3, dissemination activities will be conducted throughout the CTSA network and beyond.

Early Check: A Collaborative Innovation to Facilitate Pre-Symptomatic Clinical Trials in Newborns (U01)

Institution: RESEARCH TRIANGLE INSTITUTE (UNIV OF NORTH CAROLINA CHAPEL HILL)

Collaboration Institutions: DUKE UNIVERSITY, WAKE FOREST UNIVERSITY HEALTH SCIENCES

Principal Investigators: BAILEY, DONALD B (contact); COTTEN, CHARLES MICHAEL; KING, NANCY M P; POWELL, CYNTHIA MARION

Website: www.earlycheck.org

Newborn screening (NBS) is designed for pre-symptomatic identification of serious conditions for which there are effective treatments that must begin early. Central to NBS policy is evidence that pre-symptomatic treatment is more effective than treatment after symptoms appear. Unfortunately, such evidence is difficult to amass because most nominated conditions are rare and the effort required to identify pre-symptomatic infants for clinical trials is

substantial. Researchers and advocates find themselves in a classic “Catch 22” situation—NBS cannot happen without sufficient evidence, but gathering this evidence necessarily requires large-scale population screening. This problem is such a formidable barrier to translational research that many disorders will never have the evidence needed to justify inclusion in NBS programs. We propose to develop and implement Early Check—a research program in which voluntary screening for a panel of conditions is offered on a statewide basis. Early Check would allow rapid screening for new candidate conditions, advance understanding of early disease, and facilitate registry and clinical trial recruitment. We will build and implement an experimental research program with an ongoing evaluation component in which we revise and improve the program as we learn from our implementation experiences and engagement with the general public and families directly affected by screening. Once we have finalized all aspects of the program, we will offer screening for a gradually expanding set of conditions to all 120,000 birthing families per year in North Carolina. Our first condition offered for screening will be spinal muscular atrophy, a life-threatening degenerative motor neuron disorder. We will determine participation rates; conduct screening; return results; provide counseling and clinical services; support families in caregiving decisions; inform families of ongoing clinical trials; provide support for families in deciding whether they want to participate in a clinical trial; and follow children and families over time to study benefits, harms, and psychosocial outcomes of screening. We will seek external funds to expand Early Check to other candidate disorders, such as fragile X syndrome. Implementation data will be used to refine the process, inform replication, and establish an infrastructure for testing other candidate conditions. To achieve long-term viability, we will develop a model of public-private partnerships based on collaborative engagement with federal agencies, foundations, patient advocacy groups, and industry.

Leveraging existing registry resources to facilitate clinical trials (U01)

Institution: DUKE UNIVERSITY

Collaborating Institutions: JOHNS HOPKINS UNIVERSITY, VANDERBILT UNIVERSITY MEDICAL CENTER

Principal Investigators: LI, JENNIFER S (contact); BALDWIN, H SCOTT; JACOBS, JEFFREY PHILLIP

The central objectives of this proposal are to: 1) design and conduct a “trial within a registry” of perioperative steroids to improve outcomes after neonatal cardiopulmonary bypass (CPB) surgery; 2) develop the infrastructure for a registry-based pediatric heart surgery trials network; and 3) define a new model for cost-effective clinical trials that may be used to study understudied diseases and conditions. The proposed work will be accomplished through

collaboration between three CTSA hubs, Duke University, Johns Hopkins University and Vanderbilt University, as well as the Society of Thoracic Surgeons and its analytic center, the Duke Clinical Research Institute. Clinical trials are resource-intensive and costly. Consequently many patient populations remain understudied with limited evidence to guide clinical practice. One mechanism to improve the evidence base is to leverage existing registry resources to conduct simple, efficient and low cost trials. This “trial within a registry” concept can: 1) optimize trial design by using registry data to inform clinical trial simulations; 2) improve access to study subjects and centers; 3) provide quality control mechanisms ensuring efficient, accurate, and cost-effective data collection; and 4) provide mature and tested infrastructure to compile, analyze and disseminate trial data. The proposed work will demonstrate the benefits of the “trial within a registry” approach in an understudied and vulnerable patient population, neonates undergoing heart surgery with CPB. Mortality after neonatal heart surgery occurs in 10% with major complications in 23%. These poor outcomes are related to the severe neonatal systemic inflammatory response to CPB. For decades high-dose systemic steroids have been used to reduce post-CPB inflammation after neonatal heart surgery. However there are limited data to support this practice; prior trials have all been small and have relied upon surrogate outcome measures. Recent data from adults undergoing CPB suggest that steroids contribute to worse outcomes. There is an urgent and unmet need for a large scale, conclusive trial of steroids after neonatal CPB focused on clinically meaningful endpoints. This trial can be readily conducted at a fraction of the cost of a typical clinical trial by leveraging the existing infrastructure of the Society of Thoracic Surgeons Congenital Heart Surgery Database.

Translating Research Into Practice: A Regional Collaborative to Reduce Disparities in Breast Cancer Care (U01)

Institution: BOSTON MEDICAL CENTER

Collaborating Institutions: TUFTS UNIVERSITY, UNIVERSITY OF MASSACHUSETTS, HARVARD MEDICAL SCHOOL, UNIVERSITY OF CHICAGO

*Note: This U01 was co-funded by NCATS and the NIH Office of Behavioral and Social Sciences Research

Principal Investigators: BATTAGLIA, TRACY ANN (contact); FREUND, KAREN; HAAS, JENNIFER S; LEMON, STEPHENIE C

The transfer and application of scientific evidence into everyday practice is necessary to mitigate health disparities, yet roadblocks persist in broad implementation of evidence-based interventions among vulnerable communities experiencing disparities. The Boston Breast Cancer Equity Coalition was formed in 2014 in response to persistent city-wide disparities in

breast cancer mortality among minority, low-income women. The Coalition identified three evidence-based strategies known to reduce delays in care that have yet to be deployed into clinical practice, due to a lack of implementation strategies (T3-T4 implementation translation). Translating Research into Practice (TRIP) draws upon the principles of community-engaged dissemination and implementation science to systematically facilitate deployment and utilization of: (a) regional patient registries; (b) systematic screening for social barriers to care with a personalized referral plan; and (c) patient navigation services into one integrated model of care to improve the quality and effectiveness of care delivery, in this case for minority and/or low-income women with breast cancer. The four Massachusetts CTSA hubs (Boston University, Harvard University, Tufts University, and University of Massachusetts) partnered with the Boston Breast Cancer Equity Coalition to overcome barriers to widespread implementation and dissemination of evidence based practices that will improve the delivery of guideline-concordant care to vulnerable women. The study will be conducted in three phases: First, we will deploy regional CTSA expertise to support the local healthcare community to develop the three individual TRIP components, create the study data repository, and refine and integrate the intervention components into a cohesive package that can be implemented within the context of the clinical work flow of the partnering sites. Then, we will conduct a type 1 hybrid effectiveness- implementation study among 1,100 vulnerable breast cancer patients seeking care across six health systems in Boston. We will evaluate the healthcare system's ability to implement these three generalizable tools (fidelity to intervention protocol, costs, local adoption/sustainability, and acceptability) into an integrated intervention and the impact on clinical outcomes (time to first treatment and receipt of guideline concordant cancer care). Finally, we will promote widespread dissemination to other CTSA hubs, health systems, and community- academic partnerships. Our main hypothesis is that widespread implementation of these tools will eliminate care delivery disparities, and CTSA hubs have the translational expertise to overcome barriers to such implementation.

Measure development to accelerate the translation of evidence based clinical guidelines into practice (U01)

Institution: NEW YORK UNIVERSITY SCHOOL OF MEDICINE

Collaborating Institutions: AECOM, OREGON HEALTH & SCIENCE UNIVERSITY, MEDICAL UNIVERSITY OF SOUTH CAROLINA

Principal Investigators: SHELLEY, DONNA R (contact); BERRY, CAROLYN ANNE

Half of the U.S. adult population has one or more preventable risk factors for cardiovascular disease (CVD) including hypertension (HTN) and hyperlipidemia, but only 10%

are meeting all of their clinical goals due to suboptimal adoption of guideline recommended care. This is largely because primary care practices and health care systems are struggling to identify which combination of care structures and processes they need to implement to become high performing practices. The objective of this proposal is address this translational gap by developing a reliable, valid, and pragmatic assessment tool that will identify core features of primary care practices that are related to high performance on CVD-related outcomes. Despite a large body of research on practice transformation and improvement, we lack a systematic and scalable approach to identifying which features of primary care infrastructure and processes are associated with better patient outcomes. This lack of a reliable, validated, pragmatic assessment tool to define the practice changes that drive high performance in primary care continues to impede implementation of evidence-based care for chronic disease prevention and the translation of innovations in health care into routine practice. We therefore propose a mixed-methods study combining data analytics, survey techniques in the context of a two-stage Delphi process and qualitative in-depth interviews to delineate and prioritize elements of care structure and processes (e.g., decision support) that are hypothesized to be associated with improvements in CVD-related patient outcomes. We will then develop and validate a measurement tool for identifying gaps in care structures and processes that are amenable to change, and if implemented, will improve CVD-related patient outcomes. A strength of this proposal is collaboration across four Clinical and Translational Science Institutes: (1) New York University School of Medicine (NYUSoM)-Health and Hospitals CTSI (NYU-H+H CTSI), (2) Oregon Health & Science University (OHSU) Oregon Clinical Translational Research Institute (OCTRI), (3) Medical University of South Carolina's South Carolina Clinical Translational Institute (SCTR), and (4) the Institute for Clinical and Translational Research at Einstein and Montefiore (ICTR), and six geographically diverse partnering national practice networks that will form the research team for this proposal. The proposed research is significant because it will fill a methodological gap that impedes translation of innovations in health care into routine practice. Findings from use of the assessment tool will therefore provide a much-needed roadmap for building capacity and infrastructure for practice transformation, continuous quality improvement (i.e., adoption and sustainability of innovation) and improvements in population health.

A National iPS Cell Network with Deep Phenotyping for Translational Research (U01)

Institution: BOSTON UNIVERSITY MEDICAL CAMPUS

Collaborating Institutions: HARVARD MEDICAL SCHOOL, UNIVERSITY OF CHICAGO, UNIVERSITY OF PENNSYLVANIA

Principal Investigators: KOTTON, DARRELL N (contact); COWAN, CHAD ALBERT; GILAD, YOAV ; MORRISEY, EDWARD E; WILSON, ANDREW A

The discovery of iPSCs provides an unprecedented opportunity for any scientist to derive an inexhaustible supply of patient-derived primary cells. These cells containing each patient's own genetic background can now be applied for in vitro human disease modeling, drug screening of personalized therapeutics, and the development of future regenerative cell-based therapies. The most valuable human clones already generated by the CTSA investigators collaborating on this proposal not only carry common disease-associated mutations and polymorphisms, but also carry knock-in fluorochrome reporters targeted to specific loci through state-of-the-art gene editing technologies. The goal of this proposal is the establishment of a CTSA network of induced pluripotent stem cell (iPSC) repositories and iPSC cores that will enable advanced disease modeling using >1000 existing normal and disease specific human cell lines and banking 6,000 additional samples procured from the 2nd and 3rd generation participants of the Framingham Study. A concerted effort for curation, sharing, and distribution of this vital resource across all CTSA does not exist. This proposal thus creates a CTSA iPSC Network led by teams who have championed an "Open Source Biology" approach, freely sharing iPSC lines and their reprogramming reagents with more than 500 labs to date across the globe. Its goals are to make patient-derived iPSCs together with the tools and expertise for their genetic manipulation available to the greater research community on a large scale to realize their promise for extending understanding of disease and developing potential therapies. To achieve these goals, it proposes: a) national sharing of >1000 iPSC lines already derived by the CTSA teams collaborating in this proposal, representing a critical resource in high demand by both basic and clinical researchers, b) development and support of formalized education and training programs able to nationally disseminate the expertise required to fully harness these new tools and differentiate them into the wide diversity of human cell lineages, c) maintenance and sharing of open source gene-editing tools and gene edited iPSC lines that will enable CTSA investigators to manipulate the human genome at will, and d) derivation for national sharing of additional iPSC lines generated from the most densely clinically and genetically phenotyped cohort of individuals currently followed in the USA today: the ~6,000 participants of the second and third generations of the Framingham Study.

Development, Implementation and Assessment of Novel Training in Domain-based Competencies (DIAMOND) (U01)

Institution: UNIVERSITY OF MICHIGAN

Collaborating Institutions: TUFTS UNIVERSITY BOSTON, UNIVERSITY OF ROCHESTER, OHIO STATE UNIVERSITY

Principal Investigators: ELLINGROD, VICKI L (contact); JONES, CAROLYNN THOMAS; PEYRE, SARAH ELIZABETH; SELKER, HARRY P

Critical impediments currently exist regarding how clinical trials are conducted which include inconsistent (or absent) training, as well as passive learning techniques used for developing the clinical research workforce. Our group lead efforts to identify clinical research competency domains related to clinical research; however a curriculum mapped to these domains and objective competency based assessments for these domain-specific competencies don't exist. Therefore there exists a critical need to develop, demonstrate, and publically disseminate competency-based training for clinical research personnel involved in executing clinical trials throughout the CTSA consortium. To do this, we will build upon our efforts to harmonize multiple core clinical research competencies into a set of single, role-based standards (developed in Phase II of the Enhancing Clinical Research Professionals' Training & Qualification [ECRPTQ] project supported by NCATS) that serve as the framework for developing a competency-based curriculum, demonstrating its use, and disseminating this training across CTSA hubs. Our proposal entitled, Development, Implementation and AssessMent Of Novel Training in Domain-based Competencies (DIAMOND), has the objective to develop an online educational portal (DIAMOND portal) for competency-based educational offerings and assessments and to demonstrate integration of this curriculum into CTSA clinical trial education programs at DIAMOND hubs and partner sites in ways that promote the more effective, efficient, and safe execution of clinical trials; allowing for dissemination to a broader audience. Our rationale is that use of competency-based educational offerings and validated observational assessment rubrics will ensure consistency in how clinical research personnel are trained to standards that optimize the quality and efficiency of clinical trial execution. This project addresses a significant issue in clinical trials research as scientific 'answers' derived from interventional clinical trials are only as good as the quality with which the study is executed and are dependent on a highly competent study team to execute the research procedures. Therefore, translation of novel drugs, devices, and interventions into improved human health requires a well-prepared, competent workforce of clinical research professionals who effectively and efficiently conduct trials. The innovative development and demonstration of mapped competency based assessments through the DIAMOND portal will then be freely disseminated to all CTSA hubs and beyond, which we hypothesize, will eventually improve clinical trials execution, potentially resulting in accelerated health outcomes. Ultimately, DIAMOND will facilitate improved knowledge and capacity of the clinical research workforce within the CTSA consortium and strengthen clinical trials research quality by enabling NCATS' vision for an efficient and effective clinical trials network between the CTSA hubs and overall consortium.

Open Health Natural Language Processing Collaboratory (U01)

Institution: MAYO CLINIC ROCHESTER

Collaborating Institutions: COLUMBIA UNIVERSITY HEALTH SCIENCES, UNIVERSITY OF CALIFORNIA SAN DIEGO, UNIVERSITY OF MINNESOTA, U TEXAS HSC

Principal Investigators: LIU, HONGFANG (contact); JIANG, XIAOQIAN; PAKHOMOV, SERGUEI VS

One of the major barriers in leveraging Electronic Health Record (EHR) data for clinical and translational science is the prevalent use of unstructured or semi-structured clinical narratives for documenting clinical information. Natural Language Processing (NLP), which extracts structured information from narratives, has received great attention and has played a critical role in enabling secondary use of EHRs for clinical and translational research. As demonstrated by large scale efforts such as ACT (Accrual of patients for Clinical Trials), eMERGE, and PCORnet, using EHR data for research rests on the capabilities of a robust data and informatics infrastructure that allows the structuring of clinical narratives and supports the extraction of clinical information for downstream applications. Current successful NLP use cases often require a strong informatics team (with NLP experts) to work with clinicians to supply their domain knowledge and build customized NLP engines iteratively. This requires close collaboration between NLP experts and clinicians, not feasible at institutions with limited informatics support. Additionally, the usability, portability, and generalizability of the NLP systems are still limited, partially due to the lack of access to EHRs across institutions to train the systems. The limited availability of EHR data limits the training available to improve the workforce competence in clinical NLP. We aim to address the above challenges by extending our existing collaboration among multiple CTSA hubs on open health natural language processing (OHNLP) to share distributional information of NLP artifacts (i.e., words, n-grams, phrases, sentences, concept mentions, concepts, and text segments) acquired from real EHRs across multiple institutions. We will leverage the advanced privacy-preserving computing infrastructure of iDASH (integrating Data for Analysis, Anonymization, and SHaring) for privacy-preserving data analysis models and will partner with diverse communities including Observational Health Data Sciences and Informatics (OHDSI), Precision Medicine Initiative (PMI), PCORnet, and Rare Diseases Clinical Research Network (RDCRN) to demonstrate the utility of NLP for translational research. This CTSA innovation award RFA provides us with a unique opportunity to address the challenges faced with clinical NLP and through strong partnership with multiple research communities and leadership roles of the research team in clinical NLP, we envision that the successful delivery of this project will broaden the utilization of clinical NLP across the research community. There are four aims planned: i) obtain PHI-suppressed NLP artifacts with retained distribution information across multiple institutions and

assess the privacy risk of accessing PHI- suppressed artifacts, ii) generate a synthetic text corpus for exploratory analysis of clinical narratives and assess its utility in NLP tasks leveraging various NLP challenges, iii) develop privacy-preserving computational phenotyping models empowered with NLP, and iv) partner with diverse communities to demonstrate the utility of our project for translational research.

Disseminating Curative Biological Therapies for Rare Pediatric Diseases (U01)

Institution: BOSTON CHILDREN'S HOSPITAL (HARVARD)

Collaborating Institutions: UNIVERSITY OF CALIFORNIA LOS ANGELES, UNIVERSITY OF CINCINNATI

Principal Investigators: WILLIAMS, DAVID A (contact); KOHN, DONALD B; REEVES, LILITH

Gene and cell therapies, especially for rare diseases, require complex product-specific development of pre-clinical studies, costly GMP manufacturing, unique laboratory assays for monitoring, and extraordinary regulatory management to initiate, perform and oversee clinical trials that provide initial assessments of safety and efficacy. Due to the rarity of many serious and life-threatening genetic diseases in the pediatric population, an increasing number of which may be curable using emerging gene and cell therapy approaches, a significant barrier to translation of these innovative therapies and future gene editing approaches is the limited number of institutions with infrastructure to carry out these developmental steps and the complex regulatory environment involving biologicals and early phase human studies in children. This is particularly true in pediatric rare genetic diseases where no one center cares for sufficient numbers of patients to successfully carry out robust prospective trials. This set of circumstances leads to significant problems: 1) families displaced from their jobs and support structures due to lengthy relocation to participate in trials centered at sites at significant distances from their homes; 2) decisions not to participate in trials due to the lack of financial and social structures created by these displacements; 3) slow accrual to trials in spite of eligible patients. Given the recent early successes of gene transfer methods and the expanding knowledge of the genetic basis of diseases, these novel therapeutic approaches may increasingly be sought by disease experts who lack detailed knowledge of the complex translational pathway involved. Many of these experts are in research/medical centers that have not developed the costly infrastructure to efficiently move the gene transfer research to the clinic, much less to develop a multi-site clinical trial likely to recruit adequate numbers of subjects. A second impediment to efficient translation of these highly regulated trials is the time required to navigate multiple regulatory structures, in particular, reviews by multiple Institutional Review Boards (IRBs) with little experience in the complexities of gene therapy

trials. We propose to develop a network of pediatric centers with unique expertise and experience in translation of gene therapies. Our overall goal is to support investigators across multiple CTSA's to more rapidly translate complex gene therapies to early phase investigator-initiated pediatric clinical trials suitable for transfer to industry. The centers participating in this U01 would then be well positioned to apply for clinical trial funding and to enter into agreements with industry sponsors. The Disseminating Curative Biological Therapies for Rare Pediatric Diseases Collaborative Consortium will offer key services and expert advice in order to enhance enrollment on gene therapy clinical trials nationally.

Transformative Computational Infrastructures for Cell-Based Biomarker Diagnostics (U01)

Institution: J. CRAIG VENTER INSTITUTE, INC. (UNIVERSITY OF CALIFORNIA SAN DIEGO)

Collaborating Institutions: STANFORD UNIVERSITY, UNIVERSITY OF CALIFORNIA-IRVINE

Principal Investigators: SCHEUERMANN, RICHARD H (contact); QIAN, YU

The presence of abnormal cell populations in patient samples is diagnostic for a variety of human diseases, especially leukemias and lymphomas. One of the main technologies used for cell-based diagnostic evaluation is flow cytometry, which employs fluorescent reagents to measure molecular characteristics of cell populations in complex mixtures. While cytometry evaluation is routinely used for the diagnosis of blood-borne malignancies, it could be more widely applied to the diagnosis of other diseases (e.g. asthma, allergy and autoimmunity) if it could be reproducibly used to interpret higher complexity staining panels and recognize more subtle cell population differences. Flow cytometry analysis is also widely used for single cell phenotyping in translational research studies to explore the mechanisms of normal and abnormal biological processes. More recently, the development of mass cytometry promises to further increase the application of single cell cytometry evaluation to understand a wide range of physiological, pathological and therapeutic processes. The current practice for cytometry data analysis relies on “manual gating” of two-dimensional data plots to identify cell subsets in complex mixtures. However, this process is subjective, labor intensive, and irreproducible making it difficult to deploy in multicenter translational research studies or clinical trials where protocol standardization and harmonization are essential. The goal of this project is to develop, validate and disseminate a user-friendly infrastructure for the computational analysis of cytometry data for both diagnostic and discovery applications that could help overcome the current limitations of manual analysis and provide for more efficient, objective and accurate analysis, through the following aims: Specific Aim 1 – Implement a novel computational infrastructure – FlowGate – for cytometry data analysis that includes visual analytics and

machine learning; Specific Aim 2 – Assess the utility of FlowGate for cell population characterization in mechanistic translational research studies (T1); Specific Aim 3 – Assess the robustness and accuracy of FlowGate for clinical diagnostics in comparison with the current standard-of-care analysis of diagnostic cytometry data (T2); Specific Aim 4 – Develop training and educational resources and conduct directed outreach activities to stimulate adoption and use of the resulting FlowGate cyberinfrastructure. The project will have a major impact in advancing translational science by overcoming key hurdles for adoption of these computational methods by facilitating analysis pipeline optimization, providing intuitive user interfacing, and delivering directed training activities. The application of the developed computational infrastructure for improved diagnostics of AML and CLL will contribute to the new emphasis on precision medicine by more precisely quantifying the patient-specific characteristics of neoplastic and normal reactive cell populations. Although FlowGate will be developed by the UC San Diego, UC Irvine, and Stanford CTSA, the resulting computational infrastructure will be made freely available to the entire research community.

Improving Patient Reported Outcome Data for Research through Seamless Integration of the PROMIS Toolkit into EHR Workflows (U01)

Institution: NORTHWESTERN UNIVERSITY AT CHICAGO

Collaborating Institutions: HARVARD MEDICAL SCHOOL, UNIVERSITY OF ALABAMA AT BIRMINGHAM, UNIVERSITY OF CHICAGO, UNIVERSITY OF FLORIDA, UNIVERSITY OF KENTUCKY, UNIVERSITY OF ILLINOIS AT CHICAGO, UNIVERSITY OF SOUTHERN CALIFORNIA, UNIVERSITY OF UTAH

Principal Investigator: STARREN, JUSTIN B

Patient-reported outcomes (PROs) reflect the experience of health and healthcare as reported directly by the patient. There is increasing evidence that capturing PROs will be an essential component of quality measurement, quality improvement, and patient engagement in care and research. The Patient-Reported Outcomes Measurement Information System (PROMIS) toolset is a PRO survey system that utilizes computer adaptive testing to provide precise measurements with a minimum number of questions, often shortening conventional PRO surveys by 10-fold or more. Unfortunately, previous attempts to integrate PROMIS into Electronic Health Records (EHR) have not integrated optimally into EHR workflows. Working with the PROMIS software team, NUCATS has developed a seamless integration of the PROMIS toolset into our local Epic EHR installation. This experience has convinced us that tight workflow integration brings many benefits and greatly facilitates incorporation of PROs into both quality and clinical research projects. The response to our presentations of this work has also

demonstrated that there is a need for similar integration at many CTSA sites. This project represents a collaboration of nine CTSA sites: NU, University of Chicago, University of Illinois at Chicago, University of Alabama at Birmingham, University of Kentucky, University of Florida, University of Utah, Harvard Catalyst CTS, and Southern California CTSI. These sites utilize a variety of different EHR platforms. The team includes the developers of the PROMIS toolset software, experts in EHR integration, and experts at SMART and FHIR. The goal of this project is to develop and evaluate a suite of software tools that will allow all CTSA sites to integrate PROMIS tools directly into their EHRs. To achieve this, we will develop software to support tight integration into the two most common academic medical center EHRs--Epic and Cerner. We will develop a generalized integration of the PROMIS toolset, utilizing the SMART-on-FHIR standard, that can be implemented in multiple EHR platforms. Finally, we will implement and evaluate these software solutions across a number of diverse CTSA sites both within and outside of the project team CTSA sites.

Limited Competition: Administrative Supplements to Enhance Network Capacity: Collaborative Opportunities for the CTSA Program (Admin Supp)

The Data:

- During FY16-17, **13 awards** were made under [PA-16-328](#)

RFA	Activity	FY16 Number of Supplements	FY16 Total Cost	FY17 Number of Supplements	FY17 Total Cost
PAR-16-328	UL1	3	\$822,391	10	\$4,250,096

- **10** primary institutions were awarded supplements through PA-16-328
- Number of CTSA Program hubs collaborating on 13 awards: **33** distinct CTSA Program hubs

Developing Policies and Practices to Leverage Data Innovation to Promote Study Recruitment

Institution: YALE UNIVERSITY

Collaborating Institutions: ROCKEFELLER UNIVERSITY, WASHINGTON UNIVERSITY

Principal Investigator: Robert S. Sherwin, M.D.

Yale proposes to collaborate with the Rockefeller and Washington University CTSA Program hubs to disseminate an approach that Yale has implemented to enhance its recruitment to clinical trials through institutional change. The goal is for the three hubs to exchange scientific information regarding the implementation of:

- systems and models for patients to opt in or opt out of their data being used for recruitment to clinical trials and for clinical research,
- electronic IRB management systems,
- grants management platforms, and
- clinical research or trial management systems.

The project will leverage both the research management strengths of each partnering hub and the institutional investments in technology platforms, educational resources and development of best practice standards at each institution. The exchange will focus on processes for expanding the participation in clinical and translational research by leveraging electronic health records and other technology, along with a translation and dissemination strategy that is likely

to be transferable across the CTSA Program. A national framework could emerge that would aid each CTSA Program hub in applying modern informatics and common best practices to accelerate participant recruitment to clinical trials.

Multi-CTSA Mini-Sabbatical Evaluation and Quality Improvement (SEQUIN)

Institution: UNIVERSITY OF ALABAMA AT BIRMINGHAM

Collaborating Institutions: NEW YORK UNIVERSITY, UNIVERSITY OF MASSACHUSETTS, CENTER FOR LEADING COLLABORATION AND INNOVATION (UNIVERSITY OF ROCHESTER)

Principal Investigator: Robert P. Kimberly, M.D.

This supplement will support the dissemination of mini-sabbaticals for KL2 scholars and TL1 trainees designed to enrich career development through experiences complementary to those offered at an investigator's home institution. The CTSA Program hubs at the University of Alabama Birmingham, New York University and the University of Massachusetts have developed this program among their hubs and are now poised to disseminate this program across the entire CTSA Program through a collaboration with the CTSA Program Coordinating Center, based out of the University of Rochester. Specifically, this supplement will:

- Conduct a national formative evaluation of mini-sabbatical experiences at CTSA Program hubs;
- Use feedback from the evaluation to refine the initial preliminary report on mini-sabbatical "best practices" developed, based on experiences at the three CTSA Program hubs; and
- Build from existing offerings at the three CTSA Program hubs to catalog a national mini-sabbatical to connect CTSA Program scholars and trainees with optimal mini-sabbatical opportunities.

The goal of these mini-sabbaticals is to acquire added competencies in specific areas of translational research, with the experience tailored to meet each investigator's individual training needs.

I-Corps at NCATS Program

Institution: University of Alabama at Birmingham

Collaborating Institutions: GEORGIA INSTITUTE OF TECHNOLOGY (PART OF THE EMORY UNIVERSITY HUB), PENNSYLVANIA STATE UNIVERSITY, ROCKEFELLER UNIVERSITY, UNIVERSITY OF CALIFORNIA, DAVIS, UNIVERSITY OF COLORADO DENVER, UNIVERSITY OF MIAMI, UNIVERSITY OF MASSACHUSETTS, AND UNIVERSITY OF MICHIGAN

Principal Investigator: Robert P. Kimberly, M.D.

This project is a collaborative effort among nine CTSA Program hubs: University of Alabama at Birmingham, Georgia Institute of Technology (part of the Emory University hub), Pennsylvania State University, Rockefeller University, University of California, Davis, University of Colorado

Denver, University of Miami, University of Massachusetts, and University of Michigan. University of Alabama at Birmingham researchers aim to adapt and disseminate the existing National Science Foundation (NSF) Innovation Corps (I-Corps™) and I-Corps™ at NIH programs to meet the needs of researchers and clinicians at academic medical centers. The overarching aims are:

- Develop a uniform, four-week curriculum that will be considered part of the official I-Corps™ body of knowledge, specific to the commercialization of clinical and translational research discoveries;
- Build capacity locally and regionally across CTSA Program hubs through a regional Train-the-Trainer program; and
- Establish common metrics and an evaluation framework to assess the effectiveness and impact of the I-Corps™ at NIH program across CTSA Program institutions.

Like the NSF and NIH I-Corps™ programs, this project prepares scientists and engineers to extend their focus beyond the university laboratory and accelerates the economic societal benefits of select basic research projects that are ready to move toward commercialization.

SPARCRequest: An e-Commerce Solution for Multisite Research and Clinical Trials

Institution: MEDICAL UNIVERSITY OF SOUTH CAROLINA

Collaborating Institutions: UNIVERSITY OF UTAH, UNIVERSITY OF IOWA

Principal Investigator: Kathleen T. Brady, M.D., Ph.D.

Website: https://sparc.musc.edu/service_requests/1561923/catalog

Publications / Presentations:

- Presenting at AMIA about Open Source Governance in (March 2018)
- Sampson, Royce R., Glenn, Julia L., Cates, Andrew M., Scott, Matthew D., Obeid, Jihad S. SPARC: A Multi-institutional Integrated Web Based Research Management System. AMIA 2013. Available from: https://www.researchgate.net/publication/259156337_SPARC_A_Multi-institutional_Integrated_Web_Based_Research_Management_System [accessed Sep 18, 2017].
- Glenn, Julia L, **Sampson, Royce R** (Fall 2011). Developing an Institution-wide Web-based Research Request and Preliminary Budget Development System. Research Management Review, Volume 18, Issue 2.

Researchers at the Medical University of South Carolina will adapt, test, and deploy strategies derived from e-commerce solutions to promote greater collaboration and accelerate the conduct of multisite research and clinical trials within the CTSA Program network — particularly with the launch of the CTSA Program Trial Innovation Network. The electronic storefront

program, called SPARCRequest[®], aims to support inter-institutional ordering and budgeting of services and resources, as well as tracking of service fulfillment and invoicing. The Medical University of South Carolina CTSA Program hub, in collaboration with the University of Utah and the University of Iowa hubs, will achieve the following overarching aims:

- Develop a governance model to provide a structure for sustainability, decision-making and co-development across CTSA Program hub adopters and other stakeholders for open-source SPARCRequest[®];
- Develop, implement, assess and disseminate open-source software that fosters adoption by other institutions, including continuous process improvement and collaborative project management; and
- Support the CTSA Program Trial Innovation Network to optimize efficiency by providing a platform for remote sharing of research resources and rapid multisite budget development.

The goal of the project is to enhance multisite study conduct and realize systematic efficiencies through a collaboratively owned and cooperatively managed electronic marketplace for CTSA Program hubs to order, price and fulfill services and study assessments across the CTSA Program network.

Innovation Labs to Enhance CTSA Program Network Capacity

Institution: STATE UNIVERSITY OF NEW YORK AT BUFFALO

Collaborating Institutions: VANDERBILT UNIVERSITY MEDICAL CENTER, KNOWINNOVATION

Principal Investigator: Timothy F Murphy, M.D.

Website: <http://www.buffalo.edu/innovationlabs/buffalo.html>

An Innovation Lab is a promising and revolutionary means for constructing new interdisciplinary teams and stimulating novel research solutions across the CTSA Program consortium.

Participants — along with a director, organizers, subject matter guides and [Knowinnovation](#) facilitators — communally explore a problem in space, generate a broad range of ideas and form transdisciplinary teams to pursue research projects. The Innovation Lab targets early-stage investigators who have limited networks and opportunities for collaboration and during an opportune time in their careers when this experience may launch their independent — yet interdisciplinary and collaborative — research programs. The project is a collaboration between the University at Buffalo and Vanderbilt University Medical Center CTSA Program hubs and the Knowinnovation facilitation team. The team will achieve the following specific aims:

- With ongoing input from multiple stakeholders (NCATS, CTSA Program hubs and Domain Task Forces) the team will develop, run and track the impact of two pilot Translational Workforce Development Innovation Labs (one at University at Buffalo and one at Vanderbilt University), and

- Evaluate the impact of the Innovation Labs in a randomized controlled that randomly assigns matched applicants to an Innovation Lab or a “treatment as usual” control group.

At the conclusion of this project, the investigators will have demonstrated the effectiveness of an innovative approach to developing new and interdisciplinary teams of young investigators who are prepared to tackle challenges in translational science.

Enhancing Network Capacity by Disseminating State-of-the-Art Methods and Tools for the Design and Analysis of Randomized Clinical Trials

Institution: JOHNS HOPKINS UNIVERSITY

Collaborating Institutions: UNIVERSITY OF MICHIGAN, HARVARD UNIVERSITY AND TUFTS UNIVERSITY BOSTON

Principal Investigator: Daniel E. Ford, M.D.

Website: <http://www.projectdidact.org/>

Representatives of the Johns Hopkins University, University of Michigan, Harvard University and Tufts University CTSA Program hubs will collaborate to disseminate state-of-the-art methods and tools for the design and analysis of randomized clinical trials. Topics being addressed include:

- Sequential, multiple assignment randomized trial designs;
- Leveraging baseline covariates to improve the efficiency of randomized trials;
- Causal analysis of pragmatic trials;
- Sensitivity analysis for randomized trials with missing outcome data; and
- Heterogeneity of treatment effects and individualized treatment effects.

The goal is to bring a full menu of critical methods and tools to the clinical and translation research community, and to help foster a common understanding that will increase the likelihood of successful implementation of the methods.

Optimizing Translational Veterinary Trials to Advance Human Outcomes

Institution: OHIO STATE UNIVERSITY

Collaborating Institutions: TUFTS UNIVERSITY BOSTON, UNIVERSITY OF MINNESOTA AND UNIVERSITY OF CALIFORNIA-DAVIS

Principal Investigator: Rebecca D. Jackson, M.D.

Website: <https://ctsaonehealthalliance.org/>

There is increasing evidence that spontaneous diseases in veterinary patients represent a unique tool to generate critical data regarding the safety and efficacy of novel drugs and

devices. Representatives of the Ohio State University, Tufts University, University of Minnesota and University of California-Davis CTSA Program hubs will facilitate the incorporation of large animal models of spontaneous disease into Investigational New Drug studies by creating and implementing standard operating practices and procedures for veterinary clinical trials across the four sites. Specific aims include:

- Optimizing and distributing a set of standard operating practices for the conduct of veterinary trials;
- Generating and implementing a veterinary Good Clinical Practice training module;
- Establishing REDCap for clinical trial management and reporting across CTSA One Health Alliance sites;
- Forming a data safety management board to oversee trials and facilitate institutional approval; and
- Developing a cohesive outreach effort to ensure consortium-wide enrollment.

Successful completion of this project will enable seamless initiation of veterinary clinical trials over multiple sites, thereby establishing a well-organized, proficient network that can rapidly provide critical information to accurately inform subsequent human translational efforts.

Real-Time Genomic Analysis Using iobio

Institution: UNIVERSITY OF UTAH*

Collaborating Institutions: UNIVERSITY OF NEW MEXICO

Principal Investigator(s): Carrie L. Byington, M.D., Willard H. Dere, M.D., F.A.C.P.

Website: <http://iobio.io>

Genomic analyses promise to revolutionize the diagnosis and treatment of inherited disease and cancers. However, many current genomic analysis tools are not accessible to clinicians and medical researchers because they require extensive bioinformatics training, hours or days of analysis time and produce static output files requiring expert processing and interpretation. Researchers at the University of Utah and the University of New Mexico CTSA Program hubs aim to improve diagnostic rates and maximize returns from DNA sequence data by incorporating a web-based analysis system, [iobio](http://iobio.io), to empower all biological researchers to analyze — easily, interactively and in a visually driven manner — large biomedical data sets into clinical practice at two Utah CTSA undiagnosed disease clinics. Specifically, this supplement will:

- Close the gap between computational and clinical genomics by training physicians to interact directly with genomic data and results; and
- Increase the diagnostic rate in complex clinical cohorts of families.

With the help of visually-guided tools in [iobio](http://iobio.io), physicians will be able to examine patient data directly, assess its quality, and identify potentially missed disease-causing variants, thereby leading to increased diagnostic rates, better health outcomes and reduced health care costs.

**This award reflects co-funding support from the NIH Big Data to Knowledge Initiative (NIH Common Fund, through the Office of Strategic Coordination/Office of the NIH Director).*

Regulatory Guidance for Academic Research of Drugs and Devices (ReGARDD)

Institution: UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Collaborating Institutions: DUKE UNIVERSITY, WAKE FOREST UNIVERSITY

Principal Investigator: John B. Buse, M.D., Ph.D.

Website: <http://www.regardd.org/>

While recent medical advances demand new regulatory guidance, few institutions have the breadth of expertise needed to address the unique issues arising from the expanding field of translational science. To that end, representatives of Duke University, the University of North Carolina at Chapel Hill and Wake Forest University CTSA Program hubs will expand an innovative platform, Regulatory Guidance for Academic Research of Drugs and Devices (ReGARDD). The platform is designed to share expertise and methodologies across institutions to provide researchers with the tools and resources necessary to find successful pathways from discovery to clinical implementation of new and innovative drugs, biologics, medical devices and therapies. Specifically, this supplement will enhance the collaborative ReGARDD program by:

- Expanding the content of the shared regulatory website to include educational resources that meet and support academic investigators' regulatory needs;
- Developing the capabilities of the regional regulatory forum to assist academic researchers in navigating an increasingly complex regulatory environment; and
- Disseminating to the CTSA Program network an innovative approach to provide regulatory guidance, share expertise and address regulatory barriers to academic investigators involved in clinical and pre-clinical research.

Combining the regulatory insight of three North Carolina CTSA Program hubs to share successful strategies and lessons learned could lead to the establishment of a robust, regional outreach program that would facilitate meaningful and fruitful collaborations among multiple stakeholders.

Trial Finder

Institution: UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Collaborating Institutions: UNIVERSITY OF CALIFORNIA, DAVIS; THE UNIVERSITY OF CALIFORNIA, IRVINE; THE UNIVERSITY OF CALIFORNIA, LOS ANGELES; THE UNIVERSITY OF CALIFORNIA, SAN DIEGO

Principal Investigator: Jennifer R. Grandis, M.D.

Failure to recruit adequate numbers of eligible and diverse participants, combined with the struggle to find investigators that have specific content expertise and experience, often results in lengthy delays and higher costs associated with clinical trials. To address these challenges, representatives of the five University of California CTSA Program hubs aim to help patients and community members easily discover actively enrolling trials and help sponsors and researchers open studies quickly by finding local collaborators. Specifically, with the aid of this supplement, the project investigators will help develop and launch:

- Trial Finder, a platform enabling the public to discover all currently enrolling clinical trials across the University of California CTSA Program network and beyond; and
- Trialist Search, a cross-institutional search tool that facilitates the identification of expert local investigators to collaborate in multisite clinical trials.

While the initial efforts will focus on the University of California, Davis; the University of California, Irvine; the University of California, Los Angeles; the University of California, San Diego; and the University of California, San Francisco CTSA Program hubs, the ultimate goal will be to expedite trial recruitment by disseminating the Trial Finder and Trialist Search approach, software, technical support, and communications strategies across the CTSA Program network and beyond.

N-Lighten Network: A Federated Platform for Education Resource Sharing

Institution: THE OHIO STATE UNIVERSITY

Collaborating Institutions: HARVARD MEDICAL SCHOOL, OREGON HEALTH & SCIENCE UNIVERSITY

Principal Investigator: Rebecca D. Jackson, M.D.

Researchers at Harvard University, Oregon Health & Science University and The Ohio State University CTSA Program hubs will develop educational resources, tools and technologies and make them available online to trainees, investigators and other members of the translational scientific team. Specifically, with the aid of this supplement, the project strives to:

- Undertake development and proof-of-concept experiments to create the foundation for a CTSA Program-wide federated education resource entitled the N-Lighten Network;
- Identify strategies that create value for CTSA Program hubs, educators and trainees to enhance utilization and engagement of N-Lighten for clinical and translational investigator education and career development; and
- Develop and pilot methodologies to evaluate educational resources based upon use and feedback from diverse trainees across the clinical and translational science spectrum from the two CTSA Program hubs and by clinical and translational science educators drawn from the Workforce Development Domain Taskforce and interested CTSA Program hubs.

At its conclusion, the project will have demonstrated both the feasibility and value of a semantically indexed, federated platform of educational resources, providing the foundation of a CTSA Program-wide N-Lighten Network that can be applied to facilitate and complement the education and training of all members of the clinical and translational workforce.

Innovative Video Consenting for Precision Medicine

Institution: UNIVERSITY OF CALIFORNIA, LOS ANGELES

Collaborating Institutions: UNIVERSITY OF CALIFORNIA, DAVIS; UNIVERSITY OF CALIFORNIA, IRVINE; UNIVERSITY OF CALIFORNIA, SAN DIEGO; AND UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Principal Investigator: Steven M. Dubinett, M.D.

Revolutions in genomic and information technologies have created unprecedented opportunities to advance the diagnosis and treatment of disease across the entire spectrum of medicine. However, to fully accomplish these goals, it is essential to collect genomic and clinical data from a very large and diverse patient population in an ethical, informed manner without disrupting the clinical flow for patients, staff and providers in high-volume centers. This CTSA Program administrative supplement will strengthen collaboration among five CTSA Program hubs (US BRAID: University of California, Davis; University of California, Irvine; University of California, Los Angeles; University of California, San Diego; and University of California, San Francisco) for developing and applying novel approaches to informed consent, including the use of remote (telemedicine) consenting, in order to enable a diverse population of patients to have access to research participation. Specifically, with the aid of this supplement, the project will:

- Develop and pilot a revised video/electronic consenting approach;
- Validate and pilot test a tiered consenting process;
- Create 20 personalized video vignettes in support of biobanking consent; and
- Create a Community Advisory Board to enhance community outreach.

This collaborative effort to enhance informed consent and foster recruitment is in line with CTSA Program goals of enhancing research methods and fostering communication among CTSA Program hubs to make clinical and translational trials more efficient. The project investigators will develop a novel consenting tool, determine best practices across five CTSA Program hubs, and ensure that the resulting developments are scalable across the entire network and beyond.

Enhancing CTSA Capacity Through Multi-Institutional Data Warehousing

Institution: UNIVERSITY OF CALIFORNIA, LOS ANGELES

Collaborating Institutions: UNIVERSITY OF CALIFORNIA, DAVIS; UNIVERSITY OF CALIFORNIA, IRVINE; UNIVERSITY OF CALIFORNIA, SAN DIEGO; AND UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Principal Investigator: Steven M. Dubinett, M.D.

Modern scientific discoveries require larger populations of data, which are seldom available to individual institutions. Unfortunately, provisioning research data from federated systems requires data extraction from separate patient data warehouses at each institution, and the resulting data often are poorly normalized, with substantial data missing and with additional data on patients who are not actually comparable. This CTSA Program administrative supplement will fund the evaluation of the potential utility of the Big Healthcare Data Initiative for providing high-quality research data sets, with a particular focus on data that could simultaneously inform performance improvement and clinical science. Specifically, with the aid of this supplement, the project investigators will:

- Implement a data research prioritization process as a component of the governance process being established for a multi-institutional centralized data warehouse;
- Assess the results of provisioning data to address high-priority research questions from a multi-institutional centralized data warehouse in comparison with data extracted from single institution data warehouses, in terms of (a) completeness and accuracy, and (b) efficiency of effort;
- Implement corrections in data harmonization and data processing to address challenges identified from assessments of research data obtained from the centralized warehouse; and
- Disseminate lessons learned in implementing research data provisioning from a multi-institutional centralized clinical data warehouse through publications, presentations and open-source code sharing.

The proposed supplement is in line with the CTSA Program mission, as it will enable investigators to evaluate the utility of a unified data warehouse for providing high-quality research data sets, disseminate lessons learned to the entire CTSA Program network and lay the foundation for more impactful, multi-CTSA Program hub research. This is a collaborative effort between the University of California, Los Angeles; University of California, Davis; the University of California, Irvine; the University of California, San Diego; and the University of California, San Francisco CTSA Program hubs. The results of the proposed project will serve to guide data warehousing and data provisioning activities among the nation's CTSA Program institutions, forming a foundation for more impactful translational research spanning multiple CTSA Program institutions.

Appendix A: List of CTSA Program Collaborative Innovation Award Supplements and Contacts for More Information

Project	PI Name(s) All	Primary Institution Awarded	Project Title	Name and Email of Project PI to learn more about this project	Website
TR001070-04S1	JACKSON, REBECCA D	OHIO STATE UNIVERSITY	Optimizing Translational Veterinary Trials to Advance Human Outcomes	Cheryl London (london.20@osu.edu)	https://ctsaonehealthalliance.org/
TR001067-04S2	DERE, WILLARD H (contact); HESS, RACHEL	UNIVERSITY OF UTAH	Real-Time Genomic Analysis Using iobio	Willard Dere (willard.dere@hsc.utah.edu)	http://iobio.io
TR001450-03S1	BRADY, KATHLEEN T	MEDICAL UNIVERSITY OF SOUTH CAROLINA	SPARCRequest: An e-Commerce Solution for Multisite Research and Clinical Trials	Royce Sampson (sampsonr@musc.edu; 843-792-4875)	https://sparcrequeststoblog.com/ ; https://sparc.musc.edu/service_requests/1561923/catalog
TR001111-04S1	BUSE, JOHN B (contact); CAREY, TIMOTHY S	UNIV OF NORTH CAROLINA CHAPEL HILL	Regulatory Guidance for Academic Research of Drugs and Devices (ReGARDD)	John Buse (john_buse@med.unc.edu)	http://www.regardd.org/
TR001881-01S1	DUBINETT, STEVEN M	UNIVERSITY OF CALIFORNIA LOS ANGELES	Innovative Video Consenting for Precision Medicine	Arash Anaeim (anaeim@mednet.ucla.edu)	
TR001881-01S2	DUBINETT, STEVEN M	UNIVERSITY OF CALIFORNIA LOS ANGELES	Enhancing CTSA Capacity Through Multi-Institutional Data Warehousing	Doug Bell (DBell@mednet.ucla.edu)	
TR001872-01S1	GRANDIS, JENNIFER RUBIN	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO	Clinical Trial Finder and PI Finder	Harold Collard (Harold.Collard@ucsf.edu)	
TR001070-04S2	JACKSON, REBECCA D	OHIO STATE UNIVERSITY	N-Lighten Network: A Federated Platform for Education Resource Sharing	Rebecca Jackson (Rebecca.Jackson@osumc.edu)	
TR001417-03S1	KIMBERLY, ROBERT P	UNIVERSITY OF ALABAMA AT BIRMINGHAM	I-Corps at NCATS Program	Molly Wasko (mwasko@uab.edu)	https://www.uab.edu/ccts/news/ccts-connects-at-ts17
TR001417-03S2	KIMBERLY, ROBERT P	UNIVERSITY OF ALABAMA AT BIRMINGHAM	Multi-CTSA Mini-Sabbatical Evaluation and Quality Improvement (SEQUIN)	Kenneth Saag (ksaag@uabmc.edu)	
TR001412-03S1	MURPHY, TIMOTHY F (contact); HARTMANN, KATHERINE E	STATE UNIVERSITY OF NEW YORK AT BUFFALO	Innovation Labs to Enhance CTSA Program Network Capacity	Timothy F. Murphy MD (murphyt@buffalo.edu)	http://www.buffalo.edu/innovationlabs/buffalo.html
TR001863-02S1	SHERWIN, ROBERT S	YALE UNIVERSITY	Developing Policies and Practices to Leverage Data Innovation to Promote Study Recruitment	Tesheia Johnson (tesheia.johnson@yale.edu)	
TR001079-04S1	FORD, DANIEL ERNEST	JOHNS HOPKINS UNIVERSITY	Enhancing Network Capacity by Disseminating State-of-the-Art Methods and Tools for the Design and Analysis of Randomized Clinical Trials	Daniel Scharfstein (dscharf68@gmail.com; dscharf@jhu.edu)	http://www.projectdidact.org/

Appendix B: List of CTSA Program Collaborative Innovation Award Projects and Contacts for More Information

Actv	Project	PI Name(s) All	Institution	Title	PI Email
R21	TR002088-01	OBEID, JIHAD	MEDICAL UNIVERSITY OF SOUTH CAROLINA	Investigating teleconsent to improve clinical research access in remote communities	jobeid@muscc.edu
R21	TR002024-01	BAJAJ, JASMOHAN S	VIRGINIA COMMONWEALTH UNIVERSITY	Modulation of Gut-Brain Axis Using Fecal Microbiome Transplant Capsules in Cirrhosis	jasmoohan@gmail.com
U01	TR001812-01	LEMON, STEPHENIE C (contact); ALLISON, JEROAN J; HARRIS, PAUL A; SAAAG, KENNETH G	UNIV OF MASSACHUSETTS MED SCH WORCESTER	Strengthening Translational Research in Diverse Enrollment (STRIDE)	stephenie.lemon@umassmed.edu
U01	TR001792-01	BAILEY, DONALD B (contact); COTTEN, CHARLES MICHAEL; KING, NANCY M P; POWELL, CYNTHIA MARION	RESEARCH TRIANGLE INSTITUTE	Early Check: A Collaborative Innovation to Facilitate Pre-Symptomatic Clinical Trials in Newborns	dbailey@rti.org
U01	TR001803-01	LI, JENNIFER S (contact); BALDWIN, H SCOTT; JACOBS, JEFFREY PHILLIP	DUKE UNIVERSITY	Leveraging existing registry resources to facilitate clinical trials	jennifer.li@duke.edu
U01	TR002070-01	BATTAGLIA, TRACY ANN (contact); FREUND, KAREN ; HAAS, JENNIFER S; LEMON, STEPHENIE C	BOSTON MEDICAL CENTER	Translating Research Into Practice: A Regional Collaborative to Reduce Disparities in Breast Cancer Care	tracy.battaglia@bmc.org
U01	TR002008-01	SHELLEY, DONNA R (contact); BERRY, CAROLYN ANNE	NEW YORK UNIVERSITY SCHOOL OF MEDICINE	Measure development to accelerate the translation of evidence based clinical guidelines into practice	donna.shelley@nyumc.org
U01	TR001810-01	KOTTON, DARRELL N (contact); COWAN, CHAD ALBERT; GILAD, YOAV ; MORRISEY, EDWARD E; WILSON, ANDREW A	BOSTON UNIVERSITY MEDICAL CAMPUS	A National iPS Cell Network with Deep Phenotyping for Translational Research	dkotton@bu.edu
U01	TR002013-01	ELLINGROD, VICKI L (contact); JONES, CAROLYNN THOMAS; PEYRE, SARAH ELIZABETH; SELKER, HARRY P	UNIVERSITY OF MICHIGAN	Development, Implementation and Assessment of Novel Training in Domain-based Competencies (DIAMOND)	vellingr@umich.edu
U01	TR002062-01	LIU, HONGFANG (contact); JIANG, XIAOQIAN ; PAKHOMOV, SERGUEI VS	MAYO CLINIC ROCHESTER	Open Health Natural Language Processing Collaboratory	liu.hongfang@mayo.edu
U01	TR001814-01	WILLIAMS, DAVID A (contact); KOHN, DONALD B; REEVES, LILITH	BOSTON CHILDREN'S HOSPITAL	Disseminating Curative Biological Therapies for Rare Pediatric Diseases	dawilliams@childrens.harvard.edu
U01	TR001801-01	SCHEUERMANN, RICHARD H (contact); QIAN, YU	J. CRAIG VENTER INSTITUTE, INC.	Transformative Computational Infrastructures for Cell-Based Biomarker Diagnostics	rscheuermann@jcvl.org
U01	TR001806-01	STARREN, JUSTIN B	NORTHWESTERN UNIVERSITY AT CHICAGO	Improving Patient Reported Outcome Data for Research through Seamless Integration of the PROMIS Toolkit into EHR Workflows	justin.starren@northwestern.edu