IMPACT
REPORT
2022-2023

UMASS

CENTER FOR CLINICAL AND TRANSLATIONAL SCIENCE

Contents

Welcome Note from the Director

I am pleased to present this report highlighting the exciting work that the UMCCTS has supported this past year.

As the COVID-19 pandemic transitioned to an endemic phase over the past year, our focus has pivoted from COVID-19 response efforts back to our mission areas of advancing translational science, supporting high impact clinical and translational research, and training a robust translational workforce, all in support of our goals of promoting health care delivery and the well-being of the communities that we serve across the Commonwealth, nation, and world.

We capitalized on our COVID-19 experiences to develop new tools, services, and training programs. Our Research Informatics Core streamlined operations and is developing a robust set of digital tools and informatics systems that promote collaboration and enable actionable insights from large data sets. Community connections, which were strengthened during the pandemic, continue to be strong and to inform and enrich our research efforts. We continue to attract and are so proud to support highly talented and productive KL2 and TL1 scholars. Last summer, we expanded our Clinical Research Internship with enhanced programming to engage undergraduate students from all 5 of our UMass sister campuses. You will see their stories highlighted in this report.

We would like to acknowledge the many individuals who have made this work possible: our community partners for informing and enriching our research efforts, our dedicated teams of researchers and collaborators across the UMass system and beyond, our trainees who inspire us with their enthusiasm and energy, and our UMCCTS staff for their tireless efforts. Our Clinical and Translational Science Award (CTSA) from the National Center for Advancing Translational Science has been an invaluable resource. Last and not least, we thank UMass and UMass Chan leadership, and especially President Meehan, Chancellor Collins, and Provost Terry Flotte for their unwavering institutional support over the years.

We look forward to continuing our important work with you over the next few years.

Katherine Luzuriaga, M.D.

PI and Director, UMass Center for Clinical and Translational Science
Vice Provost for Research
UMass Memorial Health Care Endowed Chair in Biomedical Research
Professor, Program in Molecular Medicine, Pediatrics and Medicine

EXECUTIVE LEADERSHIP

Katherine Luzuriaga, MD
PI & Director

Terry Flotte, MD
Co-Director

CORE LEADERSHIP

Jeroan Allison, MD
Arlene Ash, PhD
Nathaniel Hafer, PhD
John Harris, MD PhD
Catarina Kiefe, PhD, MD

Peter Lindenauer, MD, MSc
Beth McCormick, PhD
Milagros Rosal, PhD
Kate Lapane, PhD

Brian Lewis, PhD
Stephenie Lemon, PhD
M. Diane McKee, MD
Adrian Zai, MD, PhD, MPH

PROGRAM LEADERSHIP

Biostatistics, Epidemiology & Research Design (BERD)
Bruce Barton, PhD | Director
Arlene S. Ash, PhD | Co-Director
Sharina Person, PhD | Co-Director

Community Engagement and Collaboration Core (CECC)
Stephenie Lemon, PhD, MS | Director
Maryann Davis, PhD | Co-Director
Laura L. Hayman, PhD | Co-Director

Educational and Training Programs
M. Diane McKee, MD | Director

Integrated Biomarkers
John E. Harris, MD, PhD | Director

Institutional Review Board
Allison Blodgett, PhD | Director

(KL2) Mentored Career Development Program
Catarina Kiefe, MD, PhD | Director
Peter Lindenauer, MD, MSC, MHM | Co-Director
Beth McCormick, PhD | Co-Director
Milagros C. Rosal, PhD | Co-Director

(TL1) NRSA Training Program
Kate L. Lapane, PhD, MS | Director
Brian Lewis, PhD | Co-Director

Pilot Project Program (PPP)
Nathaniel Hafer, PhD | Director

Regulatory Knowledge and Support
Jesica Pagano-Therrien, PhD, RN, CPNP-PC | Director

Research Informatics
Adrian Zai, MD, PhD | Director

Science Participation Research Center
Jeroan Allison, MD, MSc | Director
Joanne Calista, MSW | Co-Director

Vision

The UMCCTS works in collaboration with our clinical partners to improve health and health care delivery by:

Advancing the science of translation;
Catalyzing high quality research across the translational spectrum; and
Building and supporting a robust translational workforce

Mission Statement

The UMCCTS provides cores, services, funding, education and training that catalyze new ways of doing translational science, supports trans-disciplinary collaboration, and educates the next generation of clinical and translational researchers.

CTSA Specific Aims

Workforce Development: Build and support a trans-disciplinary Clinical and Translational Research (CTR) workforce with the knowledge, skills, and institutional environment to advance high-impact translational research.

Collaboration/Engagement: Engage stakeholders throughout the translational process to optimize evidence-based, community-integrated research practices and apply these practices to specific projects that improve individual and population health.

Integration Across the Lifespan & with Underrepresented or Disadvantaged Populations: Improve insights and practices that ensure that discoveries are translated to all who might benefit.

Methods & Processes: Develop, test, and share innovative solutions to critical gaps in the translational research process from discovery to community.

Informatics: Develop, demonstrate, and disseminate informatics innovations that accelerate both translational science and translational research operations and that provide the essential evidence base for learning health systems.

Partners and Affiliates

CTSA Consortium

A. Entrepreneurship: I-Corps @ UMass

- The UMass site held a regional short course Fall 2022, led by Nate Hafer, PhD, CCTS Director of Operations. The class had four teams with six members. Teams came from UMass Chan Medical School, University of Georgia/InfraRed Rx, University of Connecticut, and New York University. The course was highly rated by learners.

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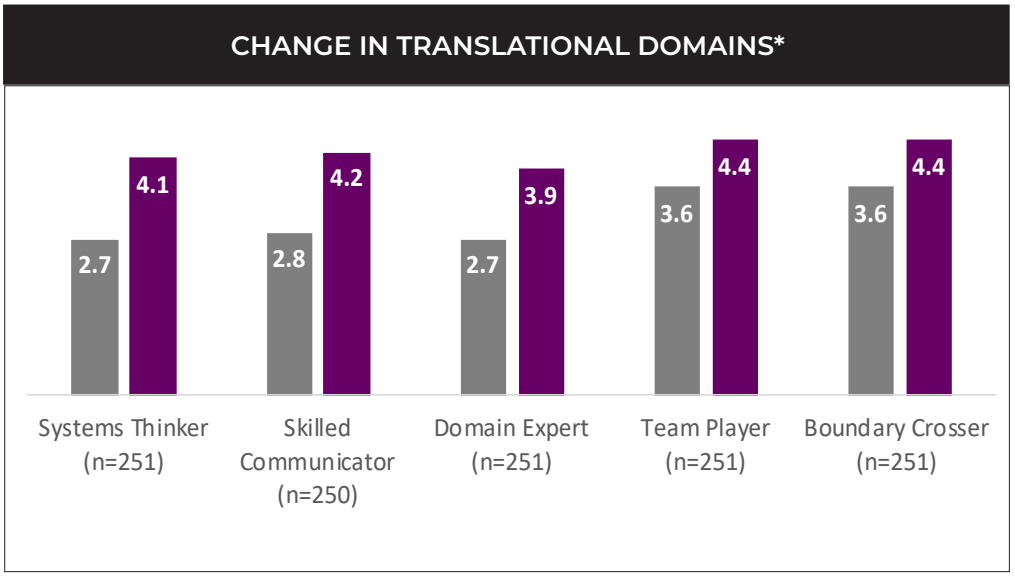


Question: Please assess your ability to do each of the following (Scale: 1 = Not at all to 5 = Very well)

* All domains have a statistically significant difference ($p<0.01$)

Partners and Affiliates

CTSA Consortium

- Dr. Hafer also participated on the instructor team for an I-Corps@NCATS short course hosted by Univ of Rochester, attended by seven teams. Schools represented included Ohio State, Cleveland Clinic, Cornell, U Rochester, SUNY Oswego, Medical College of South Carolina.

B. Informatics:

- Our informatics team was among the first 15 hubs to contribute COVID-19 related clinical data from electronic health records to the National COVID Cohort Collaborative (N3C). Projects using N3C data have resulted in 16 publications in FY22. https://ncats.nih.gov/n3c

C. Community:

- A cross-CTSA special seminar entitled "Community-Based Approaches to Promoting Behavioral Health Equity: A Call to Action", was hosted jointly with the Morehouse/Georgia CTSA, UC Davis, University of Florida, and Health Education Council, CA.
- The Strengthening Translational Research in Diverse Enrollment (STRIDE) team has begun disseminating the products developed by this NCATS-funded award. All dissemination materials are available for download from the website www.strideproject.org
- The storytelling team presented a two-part Trial Innovation Network webinar attended by nearly 90 people and created a toolkit for study teams to create their own video stories.

I-CORPS@NCATS

May 2020 – January 2023

Total: 29 programs**

Year 1: 6 programs
Year 2: 12 programs
Year 3: 11 programs

Sites (# of courses held)	**Teams**	**People**
Case Western Reserve University (3)	34	82
Columbia University	8	21
Loyola University Chicago (2)	11	35
Medical College of Wisconsin	9	25
Northwestern University (2) (Miami & UAB participated 2022)	13	41
Oregon Health & Science University (2)	17	46
Pennsylvania State* (3)	16	33
Rochester	7	13
University at Buffalo	7	22
University of California, Davis* (2)	12	19
University of Colorado, Denver* (4)	13	47
University of Miami* (3)	24	59
University of Virginia, Arlington (2)	9	28
UMass.* & Rockefeller University (2)	12	21
TOTAL Completers	**192**	**492**

UMCCTS by the Numbers *(July 1, 2022 - June 30, 2023*

REGISTRY REQUESTS

Conquering Diseases Web Sites

Average 150 searches per day

Navigation/recruitment consults

21 study teams

UMCCTS Services

Individuals using services:

1184 TRAcs Requests

475 Unique users

35 Departments

PUBLICATIONS

UMCCTS supported, KL2 and TL1 (previous and current)

188 Number for 2022 (calendar year)

109 Number for 2023 (thru Sep 2023)

3.59 Relative Citation Ratio (Mean) iCIte: Papers published in 2022

UMCCTS by the Numbers

MSCI

10
Scholars supported

COVID CLINICAL TRIALS

25 Trials
(14 Interventional)

Ages:
11% Pediatric
25% Older adults

Diversity of enrollees:
16% non-white
15% Hispanic or Latino

TRAINING AWARDS

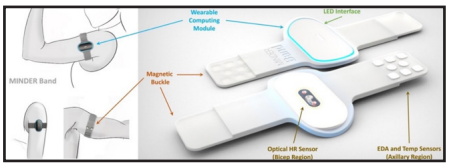
5 New KL2 Awards
7 KL2 Awardees receiving support

6 New TL1 Awards
8 TL1Awardees receiving support

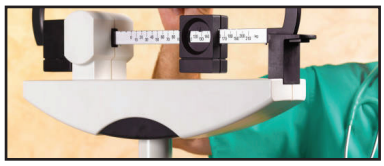
12 Pilot Project Program (PPP) Awards receiving support

In the News

AI-powered arm band to detect opioid use disorder, withdrawals is in development
Stephanie Carreiro, MD
KL2 Awardee



Transgender and gender-diverse patients face barriers to eating disorder care
Katarina A. Ferrucci, PhD
TL1 Awardee



Digital medicine study uses smart toilet seat to monitor heart health
Apurv Soni, MD
TL1 Awardee

Substance use treatment program research collaboration with Worcester County Jail
Ekaterina Pivovarova, PhD
Pilot Project Program Awardee

Creation of perinatal mental health tools lead by two UMass Chan faculty members
Nancy Byatt, DO, MS, MBA
KL2 & PPP Awardee

Scientists develop web app for visualizing locality of COVID variants and clinical data
Carly Herbert, PhD candidate
TL1 Awardee

Prestigious NIH Kirschstein Award to fund MD/PhD student's research into impact of structural racism on health
Zach Dyer, MPH, MD/PhD candidate
TL1 Awardee

PODCAST
Listen: At-home COVID-19 tests explained in time for holiday gatherings
Nate Hafer, PhD, CCTS Director of Operations and Apurv Soni, MD, TL1 Awardee

Highlights and Achievements

Education and Workforce Development

KL2 Scholars 2022-2023

Maira Castañeda-Avila, PhD
Department of Population and Quantitative Health Sciences
Mentors: Kate Lapane, PhD; Mara Epstein, ScD; Sarah Forrester, PhD and Johnggyu Baek, PhD
Project Title: "Multiple Chronic Conditions and Colorectal Cancer in Older Hispanic Adults: A Mixed Methods Approach

Nisha Fahey, DO
Department of Pediatrics; Population and Quantitative Health Sciences
Mentors: Jeroan Allison, MD, MS; Arvin Garg, MD, MPH
Project Title: "Enabling Community-Based Kangaroo Care to Mitigate Health Inequities Among Preterm Infants"

Lara Kovell, MD
Department of Medicine, Division of Cardiology
Mentor: David McManus, MD, ScM
Project Title: "Development of a Mobile Health Intervention for Blood Pressure Management in Pregnancy"

Laurel O'Connor, MD
Department of Emergency Medicine
Mentor: Edwin Boudreaux, MD
Project Title: "A mobile Integrated Health Intervention for the Management of Acute-Phase Exacerbation of Congestive Health Failure and Chronic Obstructive Pulmonary Disease"

Martha Zimmermann, PhD
Department of Psychiatry
Mentor: Nancy Byatt, DO, MBA, MS, DFAPA, FACLP
Project Title: "Developing a Scalable Intervention to Prevent Perinatal Anxiety in Obstetric Settings"

KL2 Spotlight

Sohye Kim, PhD, Assistant Professor, Eunice Kennedy Shriver Center, Departments of Psychiatry, Pediatrics, and Obstetrics and Gynecology (pictured below) is a former KL2 Scholar.

During her training period, Dr. Kim successfully launched the UMass Baby Brain Study, which uses innovative neuroimaging techniques to longitudinally study infant's brain development in the first year of life.

Dr. Kim has enrolled over 55 mother-infant dyads and is studying how the infant's social brain develops in the context of their earliest social environment. Her team uses functional near-infrared spectroscopy (fNIRS) and functional magnetic resonance imaging (fMRI) at 4-, 6-, and 12-months of age with the goal of detecting early differences and deficits in the infant's developing social brain.

Her study provides a window into the earliest years of social brain development that have thus far remained inaccessible to investigation in humans and has the potential to yield breakthroughs in identifying novel treatment targets in the developing social brain.

Pictured at left is Sohye Kim, PhD, Assistant Professor, Eunice Kennedy Shriver Center, Departments of Psychiatry, Pediatrics, and Obstetrics and Gynecology

"The KL2 Program has been instrumental in the successful launch of the UMass Baby Brain Study, a prospective longitudinal study of social brain development in human infants. The program has allowed me to develop, test, and refine innovative neuroimaging protocols to be used with infants, receive mentorship from leading experts in the field, and develop collaborations within and outside UMass with multidisciplinary team of world-class researchers."

Highlights and Achievements

Laurel O'Connor, MD, Assistant Professor, Division of Emergency Medical Services, Department of Emergency Medicine is currently a KL2 Scholar. Dr. O'Connor's research focuses on developing, testing, and, refining the acceptability and feasibility of a mobile integrated health intervention to manage patients with acute exacerbation of COPD, with the goal of reducing emergency services utilizations and hospitalizations. The qualitative needs assessment is complete and recruitment of her feasibility trial has begun.

The first manuscripts from her award were accepted for publication in summer 2023, and additional manuscripts are in preparation.

"The KL2 award has been extremely transformative for my career. It has allowed me to pursue intensive formal training in clinical investigation and dedicate focused time to experiential learning through the execution of my own research projects, while also benefiting from focused mentoring from my extremely generous mentor team. As a physician-scientist, having dedicated time to foster research skills that are complementary to my clinical background has been instrumental in developing a career develop plan and visualize a translational pathway to apply my investigational work in clinical practice. The KL2 will accelerate my trajectory to becoming an independent physician-investigator and I am extraordinarily grateful for the opportunities it has afforded me."

Dr. O'Connor's primary mentor, Edwin D. Boudreaux, PhD, Professor, Departments of Emergency Medicine, Psychiatry, and Population and Quantitative Health Sciences, and Director, Center for Accelerating Practices to End Suicide (CAPES), had this to say:

"Laurel is an incredibly talented member of the UMass Chan Medical School's faculty. She brings astute clinical and operational expertise to her academic endeavors and the KL2 is already accelerating her career trajectory as a health services researcher who seeks to improve the lives of her patients through novel care delivery models. She has taken full advantage of the award and has already made impressive headway on her research goals. She collaborates on relevant projects with investigators across the health system and enthusiastically pursues professional and academic growth through her ambitious career development plan. Her dedication and contributions to her patients, the department and the health system is impressive, and she demonstrates outstanding potential to become a successful independent physician-investigator."

Stephanie Carreiro, MD, Associate Professor of Emergency Medicine, Director, Tox(In)novation Lab, Research Director, Emergency Medicine is a former KL2 Scholar and lead investigator on the development of the MINDER system.

In her first year as a faculty member, she won the Teacher of the Year Award from the Emergency Medicine residents. Her work is supported by numerous federal, local, and industry grant mechanisms.

"The KL2 support from the CCTS jump started my research program, which focuses on developing digital solutions for substance use disorders, understanding how patients use and engage with technology, and leveraging digital technology to promote health equity. The protected time, training, and mentorship provided by the award allowed me to develop my expertise as a junior faculty member. I honed my skills in research methodology and data science via the Millennium PhD program, while simultaneously establishing collaborations with academic and industry partners in the digital medicine space. The preliminary data I collected in my KL2 catalyzed numerous lines of federal funding to develop digital biomarkers for craving in substance use disorders (NIDA) and to deploy a digital diagnostic for buprenorphine adherence (NIBIB). Inspired by my own outstanding early career experiences, I created a national, longitudinal research mentorship program for other toxicology fellows and junior faculty. The program, Advancing New Toxicology Investigators in Drug Abuse and Original Translational Research Efforts (aka the ANTIDOTE Institute) was recently funded by NIDA via an R25 mechanism, allow me to support a growing cadre of innovative investigators in medical toxicology across the country."

Highlights and Achievements

Prize for Academic Collaboration and Excellence (PACE)

Additionally, we are proud to note these two KL2 scholars are recent recipients of this award which is supported by the UMass Memorial Medical Group and the UMCCTS to promote engagement of Medical Group physicians in cutting-edge research, encourages interdepartmental collaboration, showcases the Medical Group's and Medical School's commitment to academic excellence, and reinforces the Medical Group's identity as a group comprised of academic physicians.

Pictured at left are 2023 PACE prize winners: *"The PACED Intervention: Paramedic-Assisted Community Evaluation (after) Discharge"*
Laurel O'Connor, MD (second from left). Additional team member are: Stephanie Sison, MD, Kouta Ito, MD, John Broach, MD, MBA, MPH, David McManus, MD, MSCI, Sarah McGee, MD, and Kimberly Eisenstock, MD

Pictured at right are 2022 PACE prize winners: *"Preventing Hypoglycemia Using Smart Watches and Machine Learning"*
At the center is Mark O'Connor, MD, Lucy Ding is to the right, and far right is Stephanie Carreiro, MD, PhD.

TL1 Trainees - 2023

Gretchen Weaver, MPH
PhD Student

Department of Population and Quantitative Health Sciences, UMass Chan
Mentor: Sarah Forrester, PhD, MS
Project Title: Investigation of COVID-Related Discrimination and Racial Bias Experiences of Black and Latinx Research Participants and Recruitment into Subsequent COVID-19 Studies

Sydney Griger
PhD Student

Department of Biomedical Engineering, UMass Amherst
Mentor: Stacyann Bailey, PhD
Project Title: Predicting Risk of Spine Fractures in Patients with Breast Cancer Bone Metastasis

Highlights and Achievements

TL1 Trainees - 2022

Stephen Diggs, PhD
Post Doctoral Associate
RNA Therapeutics Institute
Mentors: Andrei Korostelev, Ph.D. and Nikolaus Grigorieff, Ph.D.
Project Title: Elucidating the molecular basis of ALS using high-resolution in situ cryo-EM

Carly Herbert
MD/PhD Student
Dept. of Medicine
Mentor: Apurv Soni, MD, PhD
Project Title: Optimizing Use of Rapid Antigen Diagnostics for COVID-19

Pryce Michener
MD/PhD Student
Dept. of Population and Quantitative Health Sciences
Mentor: Peter Friedmann, MD
Project Title: Implementation of Medications for Opioid Use Disorder in Massachusetts Jails

Laël Ngangmeni, MBS
MD/PhD Student
Dept. of Population and Quantitative Health Sciences
Mentor: Kristin Mattocks, PhD, MPH
Project Title: Racial/Ethnic Differences in Provider Referrals and Perceptions of Prenatal Care among Pregnant Veterans

Preparing Engineers for Professional Practice (PEPP)

With the success of a pilot program in the fall of 2021 called Preparing Engineers for Professional Practice (PEPP), the program was expanded for the 2022-2023 school year adding participation from UMass Amherst students majoring in engineering. (See photos on page 11.)

> *"It takes diverse teams with a variety of experiences to solve complicated health care problems. PEPP is a great way to expose engineers to real problems and teach team and communication skills. We're excited that PEPP is growing and are happy to have Dr. Rachael Sirianni join us to continue to grow the program."* Nate Hafer, Director of Operations for the UMCCTS

Additional projects conducted at UMass Lowell:
"Accelerometer Development for Remote Neurological Disorders Mobility Assessment" – Submitted by Brian Silver, MD, Ugur Celik, Ph.D., UMass Chan Medical School, and Lei Chen, PhD, UMass Lowell and *"Homespace Measurement to Measure Chronic Illness"* – Submitted by Stephen Bonasera, MD, PhD, Chief, Division of Geriatrics and Palliative Care, Baystate Health

Additional project conducted at UMass Amherst:
"Reducing Falls at Baystate" – Submitted by Joohyun Chung, PhD, MStat RN, College of Nursing, UMass Amherst and Cidalia Vital, PhD, RN, Nurse Researcher, Baystate Medical Center of Surgery, UMass Chan Medical School, Baystate Health *(Cont. on next pg.)*

Highlights and Achievements

Preparing Engineers for Professional Practice (PEPP)

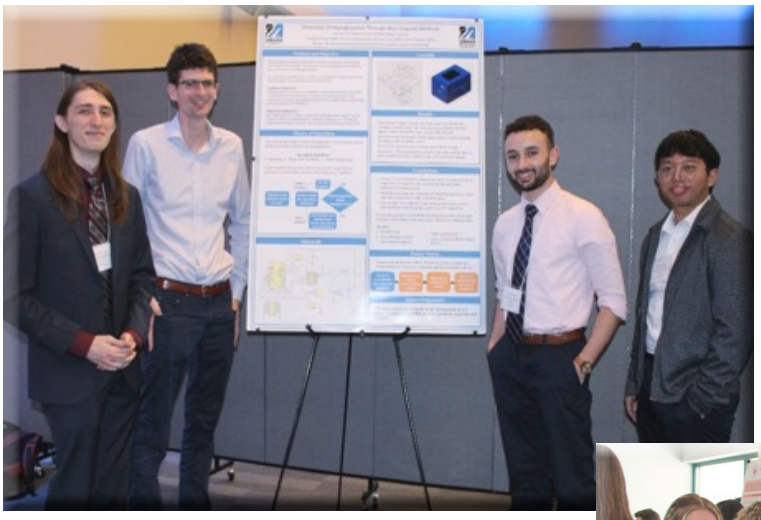


Image at left is a team of students from UMass Lowell, displaying their poster for their project titled: "Non-invasive Hypoglycemia Measurement" – Submitted by Mark O'Connor, MD, Assistant Professor of Medicine, Division of Diabetes and Endocrinology, UMass Chan Medical School, second from left.

Image at right is a team from UMass Amherst displaying their poster for their project titled: "Radio Fabric" – Submitted by Jesse Casaubon, DO, Breast Surgical Oncologist, Baystate Health, Assistant Professor of Surgery, UMass Chan Medical School, Baystate Health

Clinical Research Professionals Summer Internship

Thirteen undergraduate students from the four UMass campuses (Amherst, Boston, Dartmouth and Lowell) were selected for the 2023 Summer Undergraduate Clinical Research Internship. The interns first completed a week of foundational training to prepare them to begin working with their teams. Training topics included protection of human research subjects, introductory level Clinical Research Coordinator training, clinical records management, and data management systems.

"I loved this internship opportunity. I feel it marks a "before and after" in my learning curve, and now I feel more confident about what I want to do in the future and how to apply research to my future career." Natalia Arcos Rivera, UMass Boston, Class of 2024

Pictured at right, on either side of Natalia Arcos Rivera, are her mentors from the PQHS Department, on the left,Yurima Guilarte-Walker, Director Research Informatics Operations and Adrian Zai, MD, PhD, MPH, Chief Research Informatics Officer, on the right.

(Cont. on next pg.)

Highlights and Achievements

Clinical Research Professionals Summer Internship *(Cont. from previous pg.)*

Pictured here (minus UMass Boston students, Batoul and Nour Chouiki, who were unavailable for the photo): Front row from L-R: Connor Coe (UMass Boston), Gabrielle Pandolfo (UMass Lowell), Alice Moreira (UMass Lowell), Grace White (UMass Amherst), Christina Ciaramitaro (UMass Lowell) and Scott Thorley (UMass Amherst). Back row from L-R: Natalia Arcos Rivera, (UMass Boston), Lovia Asiedua Gyau (UMass Lowell), Daniela Salinas Camacho (UMass Lowell), Sophie Spielberger (UMass Amherst) and Mariana Hebert (UMass Dartmouth).

iSPARC Symposium at UMass Chan Psychiatry Research Day

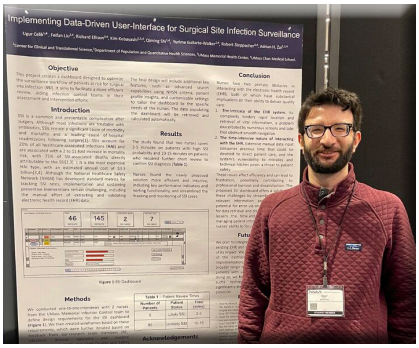
The UMass Chan Department of Psychiatry held its Research Day on April 27, 2023. One presentation in particular from this symposium, a collaboration with the UMCCTS Community Engagement and Collaboration Core, titled: ***Leveraging Community Engagement to Address Alcohol Use Disorder Disparities in the Deaf Community: Melissa Anderson, PhD, Director DeafYES and Alex Wilkens, PhD,*** satisfies many specific aims of the UMCCTS Mission Statement.

In addition, Dr. Anderson is a former K Award recipient supported from 2014-2019 and Dr. Wilkens has participated in our K Award writing program.

Read more here: https://www.umassmed.edu/sparc/news-and-events/featured-news/2023/05/research-day/

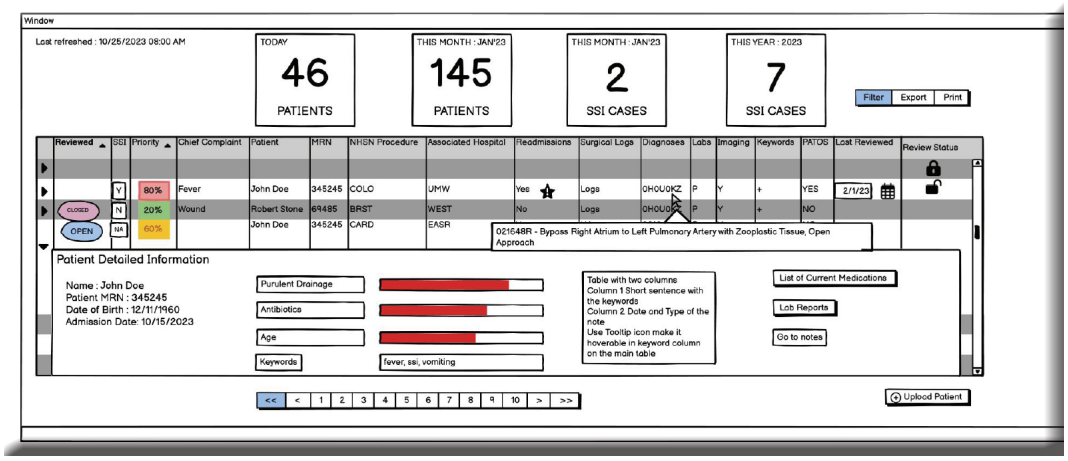
Highlights and Achievements

Research Informatics Core



This past November, staff members from several departments, including UMCCTS, UMass Chan Medical School's Population and Quantitative Health Sciences Department (Division of Health Informatics and Implementation Science), and UMass Memorial Health Center, attended the national AMIA 2023 Annual Symposium, where the theme was *Transforming Healthcare and Biomedicine for a Sustainable Future*. UMCCTS data scientist and PhD student, Ugur Celik, pictured at right, presented work related to his team's 2022 Pilot Project Program (PPP) Award titled: ***"Predictive Modeling of Surgical Site Infections: Integrating Machine Learning Structured Clinical Data Attributes with EHR Clinical Notes".*** (The full team listing can be found HERE.)

Ugur's presentation titled, ***"Implementing Data-Driven User-interface for Surgical Infection Surveillance"***, focused specifically on the creation of a digital dashboard (*pictured here*) designed to optimize the surveillance workflow of patients at risk for SSI's. By introducing a machine-learning tool enhanced by processing clinical notes that can predict potential SSI cases will make the surveillance process more efficient and effective. Having the opportunity to share their work to such a diverse and large audience is a huge step for translational science.



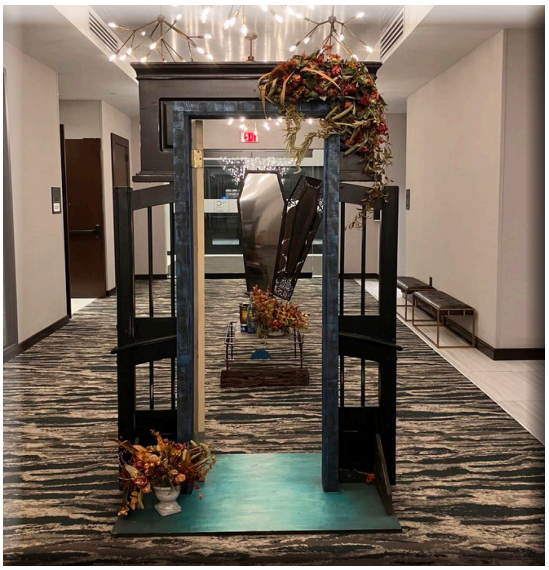
Science Participation Research Center (SPRC)

SPRC has increased community and institutional ties for the advancement of research work with underrepresented populations. These ties include direct collaborations with:

- the City of Worcester
- academic (across our 6 campuses) and community organizations

SPRC is working to affect institutional change to improve participation of diverse communities in health research by:

1. Community partnership through creation of an adaptation for a storytelling development program aimed at helping newcomer-immigrant students with their transition to their new community: *(Cont. on next pg.)*



Pictured at right, "Recuerda La Memoria" (Remember the Memory) - By: José Criollo and Germán Chiriboga, *a Health Equity Multi-Media Installation. It is a 3-piece installation to discuss health equity for Latinos during the COVID pandemic.*

Highlights and Achievements

(SPRC)

(Cont. from previous pg.)

- developing a storytelling-centered tool to help educators better engage with the journeys many of these students endure to get to their new community
- working with high school seniors to train them to adapt the storytelling process by learning about research applications for narratives, qualitative interviewing, and narrative selection for interventions

2. Partnership with various community organizations and our clinical partner UMass Memorial Health Care to develop a series of art projects to relay messages of social determinants of health and research participation through the "Artful Determinants of Health" project to ensure the versatility needed to engage with science communication at all levels.

Faculty and Staff Development

Integrated Biomarker Core: Proteomics/Olink

Over the past year, Dr. Nuria Martinez and Dr. Khashayar Afshari underwent training and achieved certification from Olink to proficiently execute the protocol. Their elevated expertise has empowered them to contribute to projects led by six investigators at UMass Chan. Human samples analyzed by the core included plasma, serum, urine, interstitial fluid obtained by blister technique, and cell culture media. Also, the core has optimized a protocol to analyze proteins within interstitial fluid obtained with a minimally invasive microneedle absorptive patch.

Services offered:

- *Access to Olink proteomics analysis for human fluids*
- *Spatial transcriptomics using Multiplexed error-robust fluorescence in situ hybridization (merFISH) – SCOPE core*
- *Access to merFISH assays in human tissues*
- *Optimization and application of live tissue sectioning through Compresstome and culture for human tissue assays*

Community Engagement and Collaboration Core (CECC)

The CECC had a very productive year integrating community engagement and team science into educational programs and workforce development, enhancing the scale, scope, and impact of collaborative research, and contributing to the advancement of the science and practice of collaboration and community engagement across the CTSA consortium. The following is a summary list:

- Educational and workforce development workshops focused on science communication:
  1. *Data Visualization for Effective Science Communication with Diverse Audiences*
  2. *Effective Communication of Risk and Uncertainty with Diverse Audiences*
  3. *Telling compelling data-driven stories: How to make numbers meaningful, accessible and actionable*

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Faculty and Staff Development

Community Engagement and Collaboration Core (CECC)

- Special Cross-CTSA seminar on "Community-based Approaches to Promoting Behavioral Health Equity: A Call to Action"
  - *Nation-wide audience of 152 participants*
  - *Held jointly with the Morehouse College /Georgia CTSA, University of California Davis, University of Florida, and the Health Education Council, CA.*
- Consultations were provided to a variety of projects including those with a focus on women's health, minority health, health equity, health disparities, mental health, substance abuse disorder, and rare diseases.
- The UMass 5-Campus Nurse Scientist Group, coordinated and supported by CECC including speakers and participants from across five campuses, presented webinars on various topics including:
  1. *Recommendations for Measuring Gender Identity in Clinical Nursing Research, February 2023*
  2. *Circle Tied to Mother Earth: A Culturally and Developmentally Appropriate Substance Use Prevention Intervention for Native Youth, December 2022.*
  3. *Mind-Body Connection: Optimism & Stroke Recovery, October 2022*

Fundamentals of Clinical Research - Mini Course

Bruce Barton, PhD along with Robert Goldberg, PhD, and Heather Tessier-Strom conducted a mini-course, ***"Fundamentals of Clinical Research"***.

The series was designed for students in training, residents, post-doctoral fellows, and junior faculty interested in learning about the most commonly employed study designs used in clinical and public health research and about the IRB review process.

Sessions included:

- *Everything You Wanted to Know About the IRB and Then Some*
- *Observational Studies Used in Clinical Research*
- *Randomized Clinical Trials: Introduction and Theory*
- *Randomized Clinical Trials: Implementation and Conduct*
- *Randomized Clinical Trials: Analysis and Publication*

Orientation to Clinical Research at UMass Chan

In February 2023, the Office of Clinical Research (OCR), initiated an in-person monthly training session titled "Orientation to Clinical Research at UMass Chan" intended to provide a high-level overview of the resources and systems at UMass Chan, as well as guidance related to account access and other institutional policies around the conduct of clinical research. (Further details HERE.)

> ***"The amount of information covered in such a short period of time was impressive. I left with a much, much clearer understanding of how research is conducted at UMass Chan."***
>
> *Emily Muller, Research Coordinator, Department Neurology, UMass Chan Medical School*

Faculty and Staff Development

Pilot Project Program Awards

Pilot Award Teams in FY 2023:

1. TITLE: "Targeted Delivery of Microbial Metabolites to Treat Inflammatory Bowel Diseases"

Co-PIs: Beth McCormick, PhD, Professor and Vice Chair, Department of Microbiology and Physiological Systems and Ernesto Soto, PhD, Senior Scientist, Program in Molecular Medicine, UMass Chan Medical School

Co-PIs: Beth McCormick, PhD above, and Ernesto Soto, PhD at left.

PI: Jamie Faro, PhD

2. TITLE: "Integrating Cancer Survivorship Care into Primary Care"

PI: Jamie Faro, PhD, Assistant Professor, Department of Population and Quantitative Health Sciences, UMass Chan Medical School; Kathleen Barry, MD(Co-I), Assistant Professor, Family Medicine and Community Health; Tzafra Tessier, PA-C (Co-I), Physician Assistant, UMass Cancer Center; and Timothy Sannes, PhD (Co-I), Assistant Professor, Department of Psychiatry, UMass Chan Medical School

3. TITLE: "Super-Resolved Thalamic Imaging Biomarkers for Neurodegeneration"

Co-PIs: Joyita Dutta, PhD, Associate Professor, Department of Biomedical Engineering, UMass Amherst; Manojkumar Saranathan, PhD, Professor, Department of Radiology, UMass Chan Medical School; and Behroze Adi Vachha, MD, PhD (significant contributor), Associate Professor, Department of Radiology, UMass Chan Medical School

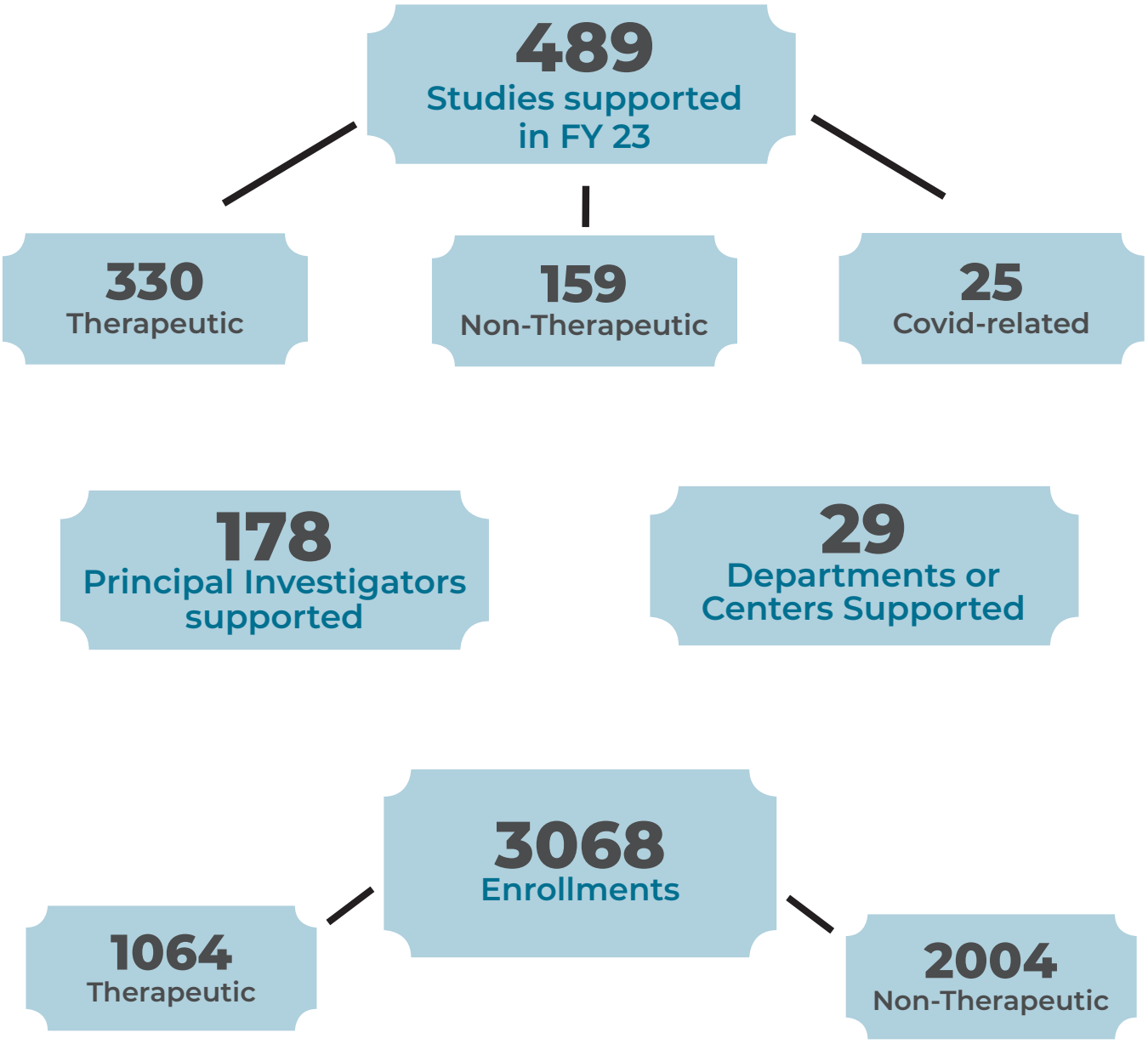
Co-PIs: Joyita Dutta, PhD and Manojkumar Saranthan, PhD

Rigor and Reproducibility Seminars

Two seminars were offered this past year to assist researchers with the ins and outs of publishing and strengthen knowledge of best practices for success. Presenters from two institutions were invited to share and are listed below. (Videos and more details HERE.)

- ***"Sharing Confidential and Sensitive Data" - Presented by: George Alter, Ph.D., Research Professor Emeritus, Institute for Social Research at the University of Michigan***
- ***"Are Predatory Journals Bad Hombres?" Presented by David Moher, PhD, MSc, BA, Professor, Senior Scientist, Clinical Epidemiology Program Ottawa Hospital Research Institute***

Clinical Research Numbers



Clinical Research Center (CRC) Numbers

68
Studies Supported

35
PIs Supported

13
Departments Supported

Research Resources

Biostatistics, Epidemiology, and Research Design (BERD)

- *Worked with over 200 investigators to develop their projects and to analyze their data*
- *Participated in the development of 25+ grant applications*
- *Created two new sections of the BERD/QMC (Quantitative Methods Core) – the Measurement and Outcomes Section (MOS) and the Qualitative Core Section in response to investigators' needs*
- *Actively involved in the UMass Center for Child Health Equity, providing both statistical leadership and statistical analytic support*
- *Supported three first-in-humans studies: (1) prevention of atrial fibrillation (and subsequent stroke) in patients receiving open-heart surgery with a gene-compound painted directly on the heart; (2) treatment of children with Tay-Sachs disease with a genetic compound developed at U Mass; and (3) treatment of children with Duchenne's Muscular Dystrophy*
- *Actively working with the Department of Biostatistics and Epidemiology at the U Mass Amherst campus in a two-way exchange of talent*

BERD Consultations:

- *Reached milestone of 3000+ consultations since May 2010*
- *Provided support for three first-in-humans Phase Ib/IIa trials*
- *Provided support for five NIH R01 applications*
- *Held weekly methods seminars to discuss innovation in research methods from Human Subject Research and Randomized Clinical Trials*
- *Integrating skills with the Research Informatics Core to provide "conveyor belt" of data access and analysis*
- *Developed a census-tract-level summary index, based on nine dimensions of neighborhood features (e.g., transportation, education, (un)employment) – that more closely tracks measures of community health, including mean life expectancy and the prevalence of chronic disease, than widely-used indices, such as the Area Deprivation Index*

Biospecimen, Tissue and Tumor Bank

The UMCCTS Biospecimen, Tissue, and Tumor Bank (Biorepository) supports investigators in patient-oriented research and has the capability to process, store, ship, and disburse specimens. The core collaborated with UMass Memorial Health to obtain discarded blood, saliva, and nasal swab specimens for use in research, including specimens for SARS-CoV-2 research. Examples of projects that used these specimens:

- *UMass Chan Medical School Newborn Screening Program examined maternal seroprevalence in > 70,000 newborn dried blood spot specimens in collaboration with the Massachusetts Department of Public Health, used to model general SARS-CoV-2 seroprevalence across Massachusetts: Cite publication: https://pubmed.ncbi.nlm.nih.gov/35213690/*
- *Supported by the UMCCTS Informatics Core and Tissue Bank/Biorepository, the UMass Center for Microbiome Research is conducting real-time SARS-CoV-2 genomic surveillance testing and variant geo-mapping over time—Cite UMass Chan press release and publication Shi et al, JMIR Formative Research, 2022*
- *In addition, the Biorepository provided services for 16 clinical vaccine or therapeutic trials, handling over 1300 specimens.*

Research Resources

Clinical Research Center (CRC)

Staff expansion occurred during the past year to keep pace with an increased volume of CRC service requests and studies. The number of visits in the CRC increased 170% from 2020 to 2023. CRC space on the first floor of the Ambulatory Care Center building was renovated allowing for additional infusion space. UMass Chan will be significantly expanding the physical footprint of the CRC, essentially doubling in size to include an early phase infusion unit in the next year.

Pictured at left is the existing fully-equipped infusion room with a recliner for patients.

Projects in Process Seminar Series (PiPSS)

- 21 session dates with 2-3 speakers at each session (35 speakers total)
- Up to 25 attendees at the seminars
- Survey feedback was extremely positive, see below:

"Great learning opportunity. Even if it's not in my area, I learn something, even if it's just how a presenter frames their study or data." ….. "I appreciated having this opportunity to present my work, and it forced me to pull it all together which I can now re-use for additional presentations."…."PiPSS has been great this year. What I liked most was learning about other resources on campus."

Research Informatics Core (RIC)

Over the past year, the Research Informatics Core (RIC) has expanded access to data and analytics to support high-impact research, serving 52 researchers with data-related projects and services and 18 departments at the UMass Chan Medical School. The RIC supported 60 Data Research Data Projects and implemented or maintained six patient registries:

1. ***Afib Registry: Clinical Registry of Afib to Study the Effectiveness of Digital Alert System***
2. ***DMD Registry: Characterization Of Duchenne Muscular Dystrophy Outcomes Using Electronic Registry***
3. ***NEXUS Registry: Novel Examinations Using Smart Technologies For Heart Health Registry***
4. ***Leukemia Registry Leukemia Digital Registry - Leukemia Phenotyping***
5. ***COVID-19 Registry: Clinical Registry of COVID to Build and Augment Risk Stratification Models for Predicting Decompensation***
6. ***OPTIMUM Registry: Observational Platform To Investigate Multiple sclerosis at the University***

The RIC participated in the National COVID Cohort Collaborative (N3C) initiative by developing the Privacy-Preserving Record Linkage addendum to ensure data privacy and improve data on boarding, warehousing, and delivery to the Research Data Repository. The RIC also implemented a Quality Assurance process to validate the UMass COVID cohort for N3C and expanded support to the National COVID Cohort Collaborative network.

(Cont. on next pg.)

Research Resources

Research Informatics Core (RIC)

The Program in Digital Medicine at UMass Memorial has received accreditation from the Accreditation Council for Graduate Medical Education to offer a Clinical Informatics Fellowship starting in 2023, which includes a rotation at the Research Informatics Core.

During the rotation, fellows:

- *will learn how to leverage informatics to support clinical researchers, including how to write informatics proposals, retrieve and analyze data from secondary clinical data sources*
- *will learn how to use the OMOP Common Data Model*
- *will be introduced to basic artificial intelligence models*
- *will learn natural language processing*
- *have access to UMass Chan's Research Data Repository and "Workspaces"*

Research Infrastructure

- Bioinformatics support
- Biorepository & Tissue Bank
- Biostatistics, Epidemiology, and Research Design (BERD)
- Clinical Research Center
- Clinical Research Implementation Support
- Research Informatics Core
- Investigational Drug Services
- M2D2
- Pilot grants
- Proteomics/OLink (BioMarkers) Facility
- Recruitment support
- Research Navigator
- Small Molecule Screening Facility
- Science Participation Research Center (SPRC)
- Umbilical Cord Blood Facility

Translational Workforce Development

- Human Research Protection Program (HRPP) Quality Assurance/Quality Improvement
- I-Corps Program at the UMCCTS
- Master of Science in Clinical Investigation Program
- Pre- and Post-doctoral Fellowship (TL1) Training Program
- "K-Club" - Research Career and Writing Group
- R Club
- Mentored Career Development (KL2) Training Program
- Millennium PhD Program
- Junior Faculty Development Program
- Clinical and Population Health Research PhD Program
- Clinical/Translational Research Pathway Program
- MD/PhD (MSTP) Program
- High School Health Careers Program (HSHCP)
- Worcester Pipeline Collaborative
- CCTS Summer Undergraduate Research Internship Program (Clinical & Translational Science)
- Morningside Summer Undergraduate Research Program (Lab Research)
- Summer Enrichment Program (SEP)
- Clinical Research Professional Group
- Clinical Research Training Course Program

COMMUNITY ENGAGEMENT

- Community Engagement consults
- Community Engagement Studios
- Public Engagement Program
- Virtual Workshops
- CIRTification Online Training