

Advance RI-CTR: Advancing a Decade of Discovery for Clinical & Translational Research in Rhode Island

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ABSTRACT

Advance Rhode Island Clinical and Translational Research (Advance RI-CTR) is a statewide consortium funded by the Institutional Development Award (IDeA) Program of the National Institute of General Medical Sciences. Over the past decade, it has strengthened Rhode Island's clinical and translational research ecosystem. Led by Brown University in partnership with Brown University Health, Care New England, the Providence VA Medical Center, and the University of Rhode Island, the consortium provides infrastructure, pilot funding, workforce development, and community-engaged resources aligned with state health priorities.

Guided by environmental assessment and sustained community input, Advance RI-CTR prioritizes chronic disease and aging, behavioral and mental health, and maternal and child health, with crosscutting emphases on substance use disorder, social determinants of health, and healthcare delivery. Through five integrated cores, the program supports investigators statewide.

Major accomplishments include establishing a practice-based research network, expanding informatics capacity, strengthening implementation science, enhancing workforce training, and increasing competitiveness for extramural funding. The program demonstrates strong return on investment and measurable statewide impact.

KEYWORDS: Clinical/translational research; research infrastructure; workforce development; community-engaged research; research funding

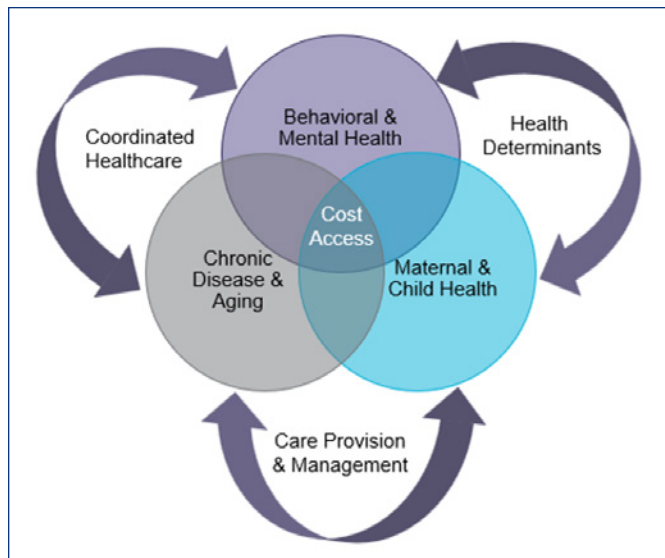
BACKGROUND

Advance Rhode Island Clinical and Translational Research (Advance RI-CTR) is in its 10th year of funding through the National Institute of General Medical Sciences (NIGMS) IDeA Program (U54GM115677). It has provided the resources, funding, and infrastructure to fuel a decade of discovery for clinical and translational research in Rhode Island. Advance RI-CTR is based at Brown University and is a consortium of research institutions in partnership with Brown University and the Warren Alpert Medical School, including Brown University Health (Brown Health), Care

New England (CNE), the Providence VA Medical Center (PVAMC), and the University of Rhode Island (URI). Led by **JAMES PADBURY, MD**, and **EDWARD HAWROT, PhD**, initially, Advance RI-CTR was one of the first successful statewide partnerships of Rhode Island universities and health care institutions. The mission of Advance RI-CTR is to support Rhode Island investigators through funding, research resources and services, and professional development offerings, with the goal of fueling discoveries and collaborations that are responsive to the health priorities of the state's communities. Advance RI-CTR has submitted a renewal application that is currently under review at the National Institutes of Health (NIH) which would provide, if funded, another five years of support to expand our network of impact and increase services and opportunities for Rhode Island's clinical and translational research workforce.

Advance RI-CTR strategically prioritizes research projects that address Rhode Island's most pressing health needs. Identification of these priorities was informed by multiple inputs, including guidance from the Advance RI-CTR's Community Advisory and Action Board (a group convened to represent community perspectives across the state), along with Affordable Care Act-mandated Community Health Needs Assessments conducted by Advance RI-CTR's partner hospitals, and the Rhode Island Department of Health's strategic framework for reducing health disparities and achieving health equity.¹⁻⁸ Priority areas are also informed by the quality indicators reported in the Commonwealth Fund's Scorecard on State Health System Performance and the National Healthcare Quality and Disparities Reports from the Agency for Healthcare Research and Quality. Three distinct priority areas emerged: Chronic Disease & Aging (including cancer), Behavioral & Mental Health, and Maternal & Child Health.⁹ Interdomain themes include addressing health determinants, healthcare coordination, and healthcare provision and management [Figure 1]. Important crosscutting areas not explicitly noted in the figure include disability and functional status, healthcare quality, infectious disease, palliative and end-of-life care, and substance use disorder. The services, resources, funding and professional development opportunities provided by Advance RI-CTR serve investigators to advance research that will directly improve health outcomes in these identified priority areas.

Figure 1. Advance RI-CTR Health Priority Areas



ORGANIZATIONAL STRUCTURE

Advance RI-CTR comprises five Cores responsible for the provision of services, training, seminars, consultations and funding awards, in addition to a centralized Administrative Core (AC). Each Core is led by distinguished faculty from each of Advance RI-CTR's partner institutions and staffed by a core manager reporting to the AC.

Community, Engagement and Outreach (CEO) Core

The CEO Core, led by **ALISON TOVAR, PhD**, and **JACLYN HUGHTO, PhD**, (Brown University School of Public Health); **JOSEPH DIAZ, MD**, (Care New England), and **MARGARET SALINGER, MD**, (Brown University Health), prepares investigators to launch research in community-based settings and implement best practices for community engaged research. The CEO Core offers expert faculty consultations and virtual and in-person training opportunities. In the past two years, the CEO Core has launched an innovative new offering for researchers: "Community Engaged Studios" (Studios). These Studios facilitate respectful conversation between a panel of community experts (e.g., people from the population that a researcher aims to serve or other stakeholders) and a research team planning, implementing, and/or disseminating information about a planned or in-progress study. The overall goal of the Studios is to facilitate the collaborative engagement of community experts and researchers to gather information that is meaningful to all stakeholders. Since its inception in 2024, the CEO Core has organized 10 Studios, and formal evaluative findings have shown a high degree of satisfaction and impact for both the researcher and for community participants [Table 1].

In addition to the Studio offerings, the CEO Core has established and provides administrative support for a Practice-Based Research Network (PBRN). The PBRN is a

Table 1. Community Engaged Studios

Investigator	Studio Title
Joanne Wilkinson	Patient Engagement for Diabetes Management in Latinx Communities
Gisela Jimenez-Colon	Transgenerational Trauma in Latinx Families: Impact on Parenting, Child Suicidality, and Access to Mental Health Services
Julia Shinnick	Intravesical Gentamicin to Prevent Recurrent UTIs
Ana Abrantes	Exercise as a Treatment for Depression
Liqi Shu	Efficacy of Portable EEG Systems in Identifying Large Vessel Occlusion Strokes in the Prehospital Setting
Michelle Wilson	Exploring the Lived Experience of Southeast Asians During the COVID-19 Pandemic
Joanne Wilkinson & Annmarie Moraitis	Transition Off Active Treatment
Alexis Gimovsky	Community Perceptions of a Shared Decision-Making Application for Labor and Delivery
Odinaka Anyanwu	Enhancing Birth Equity
Natalie Fenn	Novel Civic Engagement Intervention to Improve Mental Health Outcomes Among LGBTQ+ Adults

collaborative network of practicing clinicians who strive to formulate and answer clinical and organizational questions relevant to their practices and the communities they serve. By participation in the PBRN, practice organizations and providers can access resources from Advance RI-CTR, including vetted research proposals. These proposals align with the practices' and providers' goals and priorities, such as improving healthcare quality, fostering innovation, and achieving significant breakthroughs for patients, providers, and communities. Individual providers and practices have the flexibility to choose whether to participate in the proposed projects that have been proposed by external researchers or internally developed by the practices and/or providers. Currently, the PBRN includes 104 private, hospital-affiliated, or Federally Qualified Health Center practices. These practices represent over 400 providers and 300,000 patients, and eight studies are underway in this network [Table 2]. Moving forward, we aim to increase the number of research studies in the primary care practices of the PBRN.

Biostatistics, Epidemiology and Research Design (BERD) Core

The Biostatistics, Epidemiology and Research Design (BERD) Core is led by **CHRISTOPHER SCHMID, PhD**; **MELISSA CLARK, PhD**, and **SHIRA DUNSIGER, PhD**, (Brown SPH), and **ROCHELLE ROSEN, PhD**, (Brown Health). This Core is responsible for providing easily accessible, multidisciplinary collaborative support for quantitative and qualitative research design, analysis, interpretation, and dissemination

Table 2. Practice-Based Research Network (PBRN) Studies

Investigator	Study Title	Clinic Name
Joanne Wilkinson	Patient Engagement in Diabetes Management in Urban Latinx Communities	CNEMG
Joseph Diaz & Charles Eaton	Association between Social Drivers and Cancer Screening Uptake	CNEMG & RICPCP
Linda E. Guzman & Hannah E. Frank	Enhancing Depression Screening for Spanish-Speaking Adults in Primary Care Settings: An Implementation Science Approach	IM – letter of intent with Clinica Esperanza
Charles B. Eaton	Diabetes Health Equity Data Pilot	Brown Physicians Incorporated, CNEMG, RICPCP, PCHC
Louisa Thompson	Accelerating Digital Cognitive Screening for Alzheimer's Disease in the Primary Care Setting (Dig-Cog)	CNEMG
Jennifer Freeman	Team-Based Cognitive Behavioral Treatment (CBT) for Pediatric Anxiety in Primary Care	RICPCP
Jamie Blalock	Contextual and Social Predictors of Perinatal Mental Health	Proposal in a RICPCP
Joseph Diaz & Stacey Ranucci	CKD Screening and Monitoring	CNEMG

that can work seamlessly with and within existing health research structures. Expert faculty facilitate trainings in study design, epidemiology, biostatistics and qualitative and mixed methods to clinical and translational researchers and research staff, delivered in a variety of formats, both synchronous and asynchronous (both in-person and remote), using the latest educational methods and technologies. During the past five years, the BERD Core has completed over 900 consultations, contributing to over 80 reported research products (e.g., publications, presentations).

Biomedical Informatics, Bioinformatics, and Cyberinfrastructure Enhancement (BIBCE) Core

The Biomedical Informatics, Bioinformatics, and Cyberinfrastructure Enhancement (BIBCE) Core is led by **NEIL SARKAR, PhD**, **ELIZABETH CHEN, PhD**, and **RUBEN MARTINEZ, PhD**, of Brown University Division of Biology and Medicine (Brown BioMed). The BIBCE core is focused on the creation and maintenance of a sustainable and extensible informatics infrastructure to support: (1) expanded data sharing & analysis; (2) statewide cohort discovery; and (3) a more integrated and efficient approach to data collection and management. The BIBCE Core develops innovative data, software, and technology solutions in collaboration with clinical and translational researchers and provides state-of-the-art informatics training and engagement with clinical and translational research stakeholders. The BIBCE Core has operationalized a best-of-breed infrastructure, including Fast Healthcare Interoperability Resources (FHIR) and SMART-on-FHIR Apps, as well as Observational Health Data Sciences and Informatics (OHDSI) standards and tools (e.g., Observational Medical Outcomes Partnership (OMOP) Common Data Model) to maximize use of real-world electronic health records (EHR) data across institutions. The utilization and education in artificial intelligence (AI) approaches through enhanced literacy programs focused on responsible AI practices (including algorithmic bias assessment, model interpretability standards, and transparent

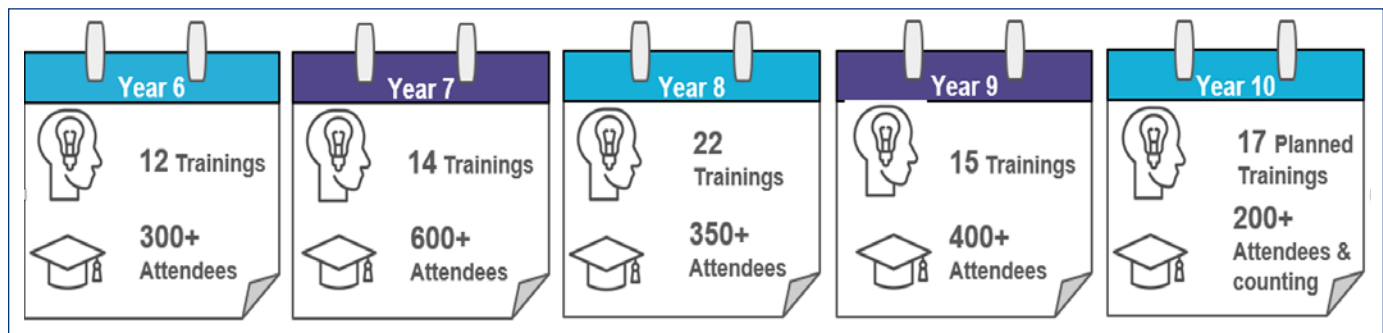
reporting frameworks) has strengthened data governance protocols to enable secure, ethical sharing of EHR data across partner institutions while maintaining compliance with privacy regulations and institutional policies, all of which will help catalyze multi-institutional collaborative research across this rapidly evolving field.

The BIBCE Core also offers services in Implementation Science in collaboration with the Brown Research on Implementation and Dissemination to Guide Evidence Use (BRIDGE) Program. Implementation science aims to maximize the public health impact of interventions and reduce the research to practice gap by encouraging implementers and program creators to examine barriers and facilitators to a practice being used, pick strategies to work with facilitators and overcome barriers, and plan for sustainable implementation. The BIBCE Core provides consultations and trainings, including an annual Implementation Science (IS) Retreat focusing on the research-practice gap for physician scientists. The IS retreat featured a keynote speaker, panel discussion, four didactic breakout sessions, and a networking lunch. These events foster interinstitutional collaboration and a team science culture among the clinical and translational workforce.

Professional Development (PD) Core

The Professional Development (PD) Core, led by **METHODIUS TUULI, MD**, (CNE), and **AUDRA VAN WART, PhD**, (Brown BioMed), has provided funding mechanisms, cohort-based training, and programming to connect faculty, mentors, and teams across our network institutions. Key accomplishments during the last 10 years include 10 two-year Mentored Research Awards (MRAs), which led to 34 federal and non-federal research grant awards and six grant resubmission awards, resulting in five funded federal and non-federal awards. The PD Core also offers the year-long Advance-K scholar program to assist junior faculty in preparation of NIH K and VA Career Development Award applications. The Advance-K program has graduated 37 faculty

Figure 2. Phase II Trainings and Reach



scholars, 65% of whom submitted research, career-development grant applications (of which 46% were funded and 11% are currently in review) and >50 other research awards. Satisfaction with this program has been high, raising confidence among participants. The PD Core also offers a four-month Advance-R program for investigators planning to submit their first R type research awards. Advance-R has supported 11 scholars who submitted seven research grant applications (two funded to date). The PD Core provides research mentor training based on a nationally recognized program developed by the University of Wisconsin. About 300 Brown and URI faculty have completed this research mentor training and 40 also completed advanced training modules. Finally, the PD Core has provided a rich program of educational offerings, including a monthly CTR seminar series, good clinical practice training workshops, and entrepreneurship training [Figure 2].

Pilot Projects Program (PPP) Core

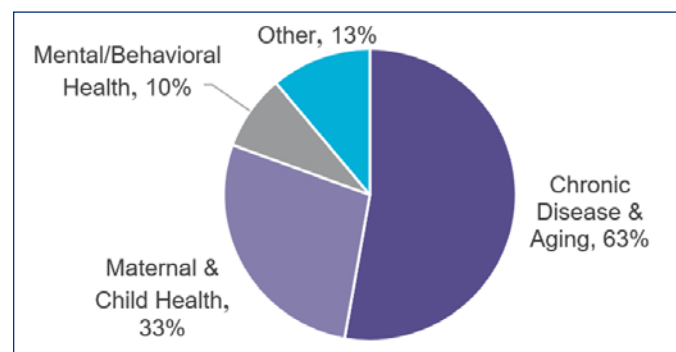
The Pilot Projects Program (PPP) Core, led by **GAURAV CHOUDHARY, MD**, (PVAMC) and **TRACIE SHEA, PhD**, (Brown BioMed) has provided funding for junior investigators to perform clinical and translational research that addresses the major health needs of Rhode Island. These grants support the development of preliminary data required for extramural research funding. The need for this type of support was evident from a survey of Brown and URI investigators performed at the time of initial funding of Advance RI-CTR.¹⁰ The PPP has fostered inter-institutional and interdisciplinary collaboration, mentoring by an established investigator, and support for project administration and professional development. Advance RI-CTR has awarded a total of 99 awards, approximately \$10.5 million, in the last decade, bringing in over \$132 million in subsequent research funding to Rhode Island.

The Advance RI-CTR Pilot Projects Program has supported a diverse portfolio of studies aligned with the state's top health priority areas. **Figure 3** presents funded pilot projects during Phase II of the CTR award (2021–2026) categorized by broad health priority areas. Although the Pilot Projects Core emphasizes research that addresses statewide

health priorities, pilot awards are also made for scientifically meritorious research with high potential for impact outside these areas (grouped as “Other” in **Figure 3**).

Beyond supporting investigator development and generating preliminary data for larger interventional studies, these pilot projects have contributed to improved health and healthcare in Rhode Island. Their impact spans numerous domains, including the identification of novel biomarkers and screening modalities, advancements in neonatal and maternal care, cancer and chronic disease management, and improvements in mental health and population health. Collectively, research funded by Advance RI-CTR has served as a substantial catalyst for addressing the state's priority health needs, serving a role that has become even more important given the recent delays and decline in federal NIH support for early-stage research.

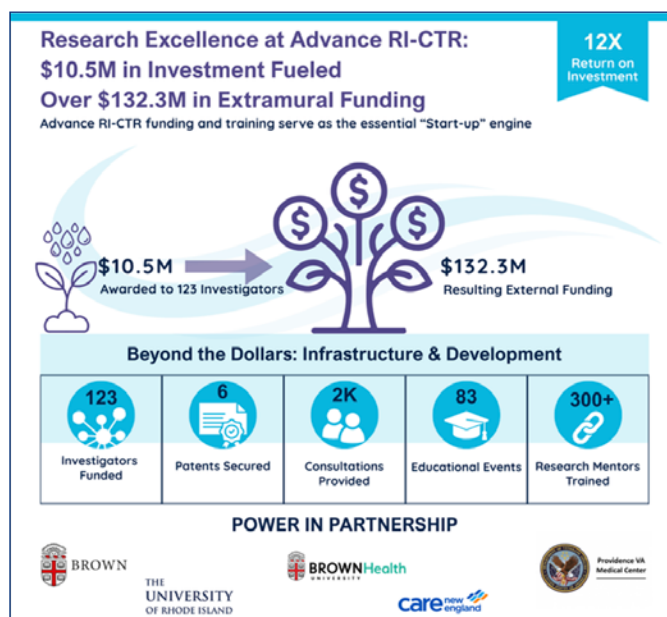
Figure 3. Advance RI-CTR Pilot Projects 2021–2026



RETURN ON INVESTMENT

Advance RI-CTR exemplifies the benefits of investing in clinical and translational research infrastructure and workforce development. One way of assessing this is by the monetary Return on Investment (ROI). In Phase I Advance RI-CTR was funded for five years in the amount of \$19,513,469, and in Phase II for a total of \$20,799,099, including supplemental research awards. Through this investment in the creation and expansion of Advance RI-CTR, over \$10.5 million was awarded to RI investigators in start-up research funds, who

Figure 4. Advance RI-CTR Return on Investment



went on to generate \$132,345,181 in extramural funding through government and private foundations. For every one dollar put into Advance RI-CTR, \$12.00 has been generated as the return on investment, as shown in **Figure 4**.

Other important considerations with respect to Returns on Investment of research funding and infrastructure programs are the career development and self-efficacy of participating young scientists. The professional growth of researchers supported by Advance RI-CTR is periodically assessed through surveys and interviews, and is evaluated in terms of research outputs, such as subsequent grant funding, peer-reviewed publications, presentations at professional conferences, and patents awarded. Illustrative qualitative feedback from awardees includes comments such as:

"Seed funding really helped protect my time from having more clinical and administrative duties until I secured additional funding," and "I don't think I could have received IRB approval without their [Advance RI-CTR] help".¹¹

The remaining articles in this edition of the *Rhode Island Medical Journal* further demonstrate these ROIs. The contributing authors were selected based on their success in using the data and experience obtained from Advance RI-CTR awards and services in obtaining extramural support for their subsequent research. It is noteworthy that the subjects of the research range from cell and small animal studies of osteoarthritis (**CHATHURAKA T. JAYASURIYA, PhD**), to implementation of best clinical practices (**DARIA SZKWARKO, DO**), to community-engaged research (**TAYLA VON ASH, ScD**, and **LAURA E. KORTHAUER, PhD**), to sophisticated statistical analytic techniques (**ASHLEY BUCHANAN, DrPH**).

The authors include a clinician (Dr. Szkwarko), psychologists (Drs. von Ash and Korthauer), a data scientist (Dr. Buchanan), and a bench scientist (Dr. Jayasuriya). They are employed by Brown University (Dr. von Ash), the University of Rhode Island (Dr. Buchanan), Care New England (Dr. Szkwarko), and Brown University Health (Dr. Korthauer). Thus, they illustrate the multi-institutional participation and contributions to Advance RI-CTR. The recipients of support from Advance RI-CTR have made major contributions towards elevating Rhode Island to the top tier of states receiving NIH research support in fiscal year 2024 when measured on a per capita (i.e., state population) basis.¹²

FUTURE DIRECTIONS

In the next phase of Advance RI-CTR, we propose to transition to a "Networked CTR" (CTR-N), as mandated by NIGMS. The purpose of the CTR-N program is to further enhance capacity to perform research on health challenges faced by the populations served by the CTR-N. It is increasingly evident that impactful and generalizable clinical and translational research requires larger populations than may be available in a single center. Furthermore, there is increasing interest in "real-world" data from deidentified electronic health records. Finally, the powerful tools provided by AI will be used to provide new insights and approaches. The Advance RI-CTR program will support statewide or multi-state regional networks to expand existing infrastructure for clinical and translational research, and to coordinate clinical research activities across partnering IDeA states. To meet these objectives, Advance RI-CTR will restructure cores, tailor and enhance our consultations and training opportunities, and expand our research network. The leadership team has refined our Vision, Mission and Theme to address these goals. The vision is "To improve health outcomes for all RI communities" with the theme of "Collaborate to Innovate."

There will be several changes to the Core structure in Phase III. The BERD and BIBCE Cores will merge to create the Research Design, Compliance, and Data Management (RDCE) Core comprising four sub-cores: Health Informatics, Qualitative Data, Quantitative Data, and Implementation Science. Services and trainings will be expanded in this next phase to offer expert trainings and consultations to help investigators remain in compliance with all government, foundation, and industry regulations and produce high-quality clinical translational research.

The Professional Development Core will expand to include trainings for professional research coordinators to enhance Rhode Island's research workforce. At the present time Advance RI-CTR and Rhode Island Hospital participate in the NIH-funded IDeA State Consortium for a Clinical Research Resource Center (ISCORE-RC) with the goal to serve as a catalyst to increase the number of clinical studies in IDeA states. To achieve this mission, ISCORE-RC

leads a comprehensive training program for clinical research coordinators and a dedicated service core to build capacity for increased clinical study opportunities. In the next phase of funding, Advance RI-CTR will expand this program to other Rhode Island health system partners and to URI.

In the next phase of funding, the Health Research Core (formerly Pilot Projects Program) will significantly expand its award opportunities in both duration and funding amounts. These award types and amounts address current gaps identified in the funding landscape, specifically to: 1) offer protected time for clinician fellows and junior faculty to develop mentored research programs in conjunction with protected time for mentors to have dedicated time for mentoring activities; 2) longer funding periods for developmental projects to support the preparation of extramural applications; 3) support for community-engaged research using the PBRN; 4) support for multi-site collaborative research, with a milestone-driven award process; 5) engagement of community members and the Community Advisory and Action Board (CAAB) of the CEO Core in reviewing applications to maximize community impact, and; 6) use of an evaluation rubric that selects proposals in which merit and impact align with the health priorities of RI communities, the latter in collaboration with the Tracking and Evaluation (T&E) Team.

CONCLUSION

Advance RI-CTR has transformed clinical and translational research in Rhode Island through a wide-reaching network of partner institutions, community organizations, and institutional affiliates. Since initial NIH funding in 2016, Advance RI-CTR has developed innovative approaches to improve and strengthen clinical and translational research across the state. Building on these impactful achievements from Phases I and II, Advance RI-CTR is positioned to address newly identified barriers and launch Advance RI-CTR into a streamlined and even more connected CTR-N framework with increased capacity for collaborative and innovative research that effectively addresses current and future health needs within RI and beyond.

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