

EXECUTIVE SUMMARY

Item Name: APPROVAL OF FY 2010 TRIF REGENTS INNOVATION FUND SUPPORT FOR HEALTH RESEARCH ALLIANCE ARIZONA (HRAA) CLINICAL AND TRANSLATIONAL SCIENCE AWARD (CTSA) EFFORTS

Action Item Discussion Item Information Item

Issue: The Board is asked to approve FY 2010 TRIF Regents Innovation Funds in the amount of \$500,000 to support the efforts of Health Research Alliance Arizona (HRAA) to secure a Clinical and Translational Science Award (CTSA) from the National Institutes of Health (NIH). Action on this funding was deferred from the August Board meeting.

Background**The National Institutes of Health (NIH) Clinical and Translational Science Award (CTSA) Program**

- In 2002 the National Institutes of Health (NIH), under new leadership, charted a new *Roadmap* for medical research in the 21st century. The call for this new paradigm came about because of the ever-increasing complexity of biology and the desire to catalyze changes to transform our new scientific knowledge into tangible benefits for people. The scale and complexity of today's biomedical research problems demands that scientists move beyond the confines of their own discipline and explore new organizational models for team science. The NIH *Roadmap* laid out a vision for a more efficient and productive system of medical research.
- As part of the NIH *Roadmap*, a new funding mechanism, Clinical and Translational Science Award (CTSA), was announced in 2006. The purpose of the CTSA Program is to assist institutions to forge a uniquely transformative, novel, and integrative academic home for Clinical and Translational Science that has the consolidated resources to (1) captivate, advance, and nurture a cadre of well-trained multi-disciplinary and interdisciplinary investigators and research teams; (2) create an incubator for innovative research tools and informative technologies; and (3) synergize multi-disciplinary and interdisciplinary clinical and translational research and researchers to catalyze the application of new knowledge and techniques to clinical practice at the front lines of patient care.
- In 2001 the state of Arizona launched its own strategic plan with the vision to become the leading southwestern state in selective bioscience sectors, built around world-class research, clinical excellence, and a growing base of cutting-edge enterprises and supporting firms and organizations. Because of Arizona's foresight

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in initiating the *Arizona Bioscience Roadmap Effort*, the state and its various educational, research, and clinical entities were well positioned to respond to the NIH's CTSA Request for Awards (RFA).

Arizona Board of Regents' Support for the CTSA Effort

- In March 2007 the Board approved \$250,000 of what were then known as TRIF Strategic Investment (TSI) funds to be allocated to the Arizona Biomedical Research Commission (ABRC) to secure technical assistance from Battelle Memorial Institute's Technology Partnership Practice for development of a full CTSA proposal. TSI funding leveraged Flinn Foundation and ABRC funding in this effort.
- In December 2007 the Board approved a five-year (FY 2008-FY 2012) funding commitment of \$2.5 million of TRIF Regents Innovation Funds to support a statewide effort coordinated by the newly created Health Research Alliance Arizona (HRAA), under the leadership of The University of Arizona, to secure a CTSA from the NIH. TRIF Regents Innovation Funds enabled HRAA to begin to implement its goal to create an evidence-based framework for addressing population-wide health problems and identifying best practices in clinical research on a statewide level.
- An application to the NIH was submitted in November 2007, with Keith Joiner, M.D., then-Dean of The University of Arizona College of Medicine, as the Principal Investigator (PI). HRAA Directors included Robert Greenes, M.D., and Lawrence Mandarino, Ph.D., from Arizona State University, and Robert Trotter, Ph.D., from Northern Arizona University. This application was extremely ambitious and suggested that HRAA would bring together an extensive set of resources to be made available to a large number of partners. The implication was that much of this would be accomplished *de novo*.
- Although not funded, the November 2007 HRAA application for a CTSA received a constructive review and a score in the mid-range of new applications in that cycle. One of the main concerns of the NIH reviewers was that the proposal was too grand to be manageable or realistically implementable. Major changes were clearly needed, and lengthy discussions with a wide range of experts and interested parties ensued. Those consulted included many HRAA stakeholders throughout the state, colleagues from funded CTSA's, and NIH staff. Through this deliberative process, the groundwork was laid for preparation of a second HRAA CTSA application in response to a new Request for Applications (RFA) issued by NIH in 2008.
- The available funding announced in the 2008 RFA was reduced by approximately 30 percent from earlier CTSA funding cycles. In light of this new financial reality, a close reading of the reviewers' critiques of the first application, and detailed discussions with NIH Project Officers, it was decided that a complete reframing of

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our CTSA application would have to be undertaken. Under Dr. Joiner's continuing leadership, two major considerations framed the structure for the new HRAA CTSA application that was submitted in October 2008. First, the statewide perspective was robustly maintained, including the same ASU and NAU Directors as for the November 2007 application. Second, clinical and translational research infrastructure was designed that would be broadly accessible to investigators throughout the state, regardless of institutional affiliation. A much tighter focus, consistent with the reduced maximum permissible budget of \$4 million per year in direct costs, concentrated explicitly on leveraging the investments that had already been made, and on funds already awarded to Arizona researchers for collaborative clinical and translational research projects spanning disciplines, institutions, and sites. Despite significant redrafting, however, the October 2008 HRAA CTSA proposal received a score that was not in the fundable range. Feedback from the NIH resulted in the conclusion by UA officials that, like all successful CTSA's, a CTSA in Arizona should be based in the clinical and translational strengths of an established college of medicine.

- Fernando Martinez, M.D., Director of the Arizona Respiratory Center and Interim Director of the BIO5 Institute, will be the new CTSA principal investigator and will direct a new Clinical and Translational Science Institute (CTSI) within BIO5 that will serve as the administrative home for CTSA activities at The University of Arizona. Dr. Martinez already is working with faculty at Arizona State University and Northern Arizona University to develop a plan for a CTSA effort based at The University of Arizona and with extensive interaction with entities across the state. Details of this plan will be presented to the Board of Regents at its December 2009 meeting.

Discussion

- TRIF support has enabled significant progress in further developing infrastructure at The University of Arizona, Arizona State University, and Northern Arizona University that will be crucial for a successful CTSA application. This support is from two TRIF sources: (1) UA's TRIF budget to support its Arizona Clinical and Translational Research and Educational Consortium (ACTREC), and (2) the TRIF Regents Innovation Fund allocation to UA for HRAA projects at ASU and NAU.

1. UA Arizona Clinical and Translational Research and Educational Consortium (ACTREC)

- Funding from UA's TRIF budget has made possible great strides in establishing the refurbished Clinical and Translational Science (CaTS) Clinical Research Unit (CRU) as the primary UA location for the conduct of experimental clinical research protocols requiring resources such as infusions, monitoring of vital signs, and administration of detailed questionnaires. Forty-eight protocols for research involving human subjects

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- are currently open in CaTS. UA TRIF support for the salaries of nine staff and operating expenses has been largely responsible for the rapid growth of CaTS, which is now recognized across the UA campus as the home for experimental protocols involving human subjects. In addition to the CRU itself, during FY 2009 CaTS assumed administrative responsibility for a clinical research facility in the Herder Building on Speedway just east of Campbell Avenue.
- The Herder facility includes a fully equipped sleep laboratory and, as an extension of CaTS, now houses prototypic equipment that was developed by Raytheon in collaboration with Arizona Cancer Center investigators for digitized evaluation of sun-damaged skin. This UA-Raytheon revolutionary approach to identifying and tracking the precursor lesions to skin cancer is supported by a large grant from Science Foundation Arizona.
 - HRAA UA created an Affiliated Community Health Center Network (ACHCN) for the purpose of CTSA-related community-based participatory research (CBPR). The participating organizations, all providing care for underserved populations, are: El Rio Community Health Center (Tucson), Fort Defiance Indian Hospital (Navajo reservation), Mariposa Community Health Center (Nogales), Maricopa Integrated Health System (Phoenix), and Mountain Park Community Health Center (Phoenix). These organizations together provide healthcare for well over 200,000 patients. The Fort Defiance patients are Native American, mainly Navajo. The other four organizations serve mainly Hispanic populations. Over 50% of patients at ACHCN facilities are Medicaid (Arizona Health Care Cost Containment System) recipients. ACHCN organizations and patients were the basis for three NIH proposals in FY 2009: Challenge Grant (stimulus package) and R21 comparative effectiveness research applications comparing a telemedicine virtual colonoscopy approach with conventional methods for colorectal cancer screening in Native Americans; and randomized patient navigator and related interventions for improving cancer screening uptake and follow up in Hispanic populations.
 - In addition to experimental clinical and translational research at UA supported by UA TRIF funds, TRIF Regents Innovation Funds support three major projects at ASU and NAU, as described below.

2. HRAA Projects at ASU and NAU

TRIF Regents Innovation Fund support to HRAA is devoted exclusively to two ASU projects and one NAU project: Arizona Insulin Resistance (AIR) Registry project and the Multi-Site Investigator Portal for Biomedical Collaboration, both at ASU; and On-Line Course and Program Development for the Tri-University CTSA Collaboration at NAU.

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The Arizona Insulin Resistance (AIR) Registry Project (ASU)

- The Arizona Insulin Resistance (AIR) Registry at ASU continues to enroll Hispanic (primarily of Mexican descent) volunteers at a rate of approximately 30 per month. Each volunteer receives an oral glucose tolerance test with insulin determinations to assess insulin sensitivity. Consenting volunteers also have DNA collected and immortalized cell lines established, as well as RNA isolated from white blood cells to assess inflammatory status. Volunteers are also asked to give consent to be contacted for participation in future clinical research trials and interventions. To date, nearly 200 participants have entered the AIR Registry, of whom 95% have consented to be contacted about future research studies and have agreed to banking of their bio-samples. These volunteers can be characterized as having an abundance of Metabolic Syndrome risk factors, which place them as a group at heightened risk for type 2 diabetes and cardiovascular disease. Through their participation, 20 volunteers so far have been diagnosed with type 2 diabetes and referred for appropriate medical care. As further evidence of the value of the AIR Registry to the Arizona community and biomedical research, two applications for access to banked bio-samples—RNA and plasma—have been received.

The Multi-Site Investigator Portal for Biomedical Collaboration (MSIPBC) (ASU)

- This ASU-developed and -based project is being conducted to develop a capability that is essential for multi-party, multi-site collaboration in CTSA-translational biomedical research—a web portal that enables investigators, wherever they are and whatever affiliation they have, to: 1) find people, information, and research resources they need; 2) access and use a growing set of resources through a consistent interface; and 3) create and manage ad hoc collaborations for projects on which they are working, together with the resources and overall usage to provide feedback to users, as a form of online marketplace, and also to enable the CTSA management team to evaluate overall effectiveness. An approach has been developed that is easily extensible and adheres to evolving standards and software architectures. This approach will facilitate modularity and distributed functionality to enhance its robustness. In FY 2009, the first draft of the dynamic, social-network based website in the .NET framework was completed. Formal terminologies are used to tag and organize content. Website content is tagged with a formal ontology of terms (MeSH), so that it can be easily integrated in the scientific literature and researcher profiles. A MeSH term browser was created to aid in assigning MeSH terms to any content in the HRAA portal (static content, events, groups, publications, etc.).

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On-Line Course and Program Development for the Tri-University CTSA Collaboration (NAU)

- Education, training and evaluation, and community collaboration are central components in clinical and translational research. NAU HRAA has been charged to take the coordination lead in on-line course and program development for the tri-university CTSA collaboration. The Education Coordinator located at NAU oversees the statewide coordination and oversight of graduate education programs for HRAA. NAU is exploring cutting-edge approaches to the on-line development and delivery of a new graduate program. An academic home has been created for the graduate certificate located in Clinical and Translational Science in the Interdisciplinary Health Policy Institute. NAU HRAA is developing and overseeing a comprehensive evaluation strategy for the statewide approach to clinical and translational science. Educational accomplishments in FY 2009 include syllabus development for seven new graduate certificate courses in clinical and translational science. These courses include: HPI 600 – The Dynamics, Structure, and Management of Interdisciplinary Research (approved); HPI 601 – Responsible Conduct of Science and Regulatory Principles for Human Research (approved); ANT 521 – Research Ethics in Community Research and Vulnerable Populations (approved); and HCR 569 – Applied Principles of Data Management and Inferential Statistics in Healthcare Research (approved). Evaluation accomplishments included a biomedical informatics pilot for the AIR Registry through the HRAA web portal (MSIPBC). Community collaboration progress includes outreach to North Country HealthCare to establish an Institutional Review Board (IRB) of record.

Strategic Implications

- TRIF funds will significantly help the universities attain the Research Excellence and the Community Engagement/Workforce Impact goals of the system's *2020 Vision* long-term strategic plan.

Conclusion

- At its August 2009 meeting, the Arizona Board of Regents approved the FY 2010 TRIF budget for the Arizona University System in the total amount of \$67.5 million. Action on \$500,000 of FY 2010 TRIF Regents Innovation Fund support for the HRAA CTSA effort was deferred, pending receipt of more information by the Board as to the planned use of the funds.
- The University of Arizona TRIF support for ACTREC and TRIF Regents Innovation Fund support for HRAA projects at Arizona State University and Northern Arizona

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University have led to the development of essential components of a future successful CTSA application.

- Most of the CTSA's funded thus far by the NIH are at institutions that formerly had NIH-funded General Clinical Research Centers (GCRC). The CaTS Clinical Research Unit at UA now fulfills the functions of an erstwhile GCRC, and it is inconceivable that a future CTSA could be funded without the existence of such a facility.
- The Arizona Insulin Resistance (AIR) Registry at ASU is a quintessential example of a highly innovative resource for the conduct of cutting-edge translational research. Patients and their biospecimens are accruing steadily to the Registry. A number of requests have already been received for access to Registry materials and data. The Registry and the research questions that it will allow to be answered are particularly germane to the current obesity and type 2 diabetes epidemics and their impact on health disparity in populations of our state.
- Biomedical informatics as a discipline is at the core of the entire CTSA initiative. The nationally and internationally renowned ASU contributions to this discipline are a major asset and have been recognized as such in the reviews of both previous HRAA CTSA applications. MSIPBC will be an essential component at the core of the next and successful CTSA application.
- An educational program meeting specific requirements is an obligatory part of a CTSA application. The lead taken by NAU in developing on-line educational resources precisely fits CTSA requirements. Furthermore, what has been accomplished plays to Arizona's acknowledged prowess in distance learning.
- FY 2008-FY 2012 budgets and performance measures for the TRIF Regents Innovation Funds follow. Continuation of this funding in FY 2011 and FY 2012 will be reconsidered by the Board of Regents at its December 2009 meeting.

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FINANCIAL INFORMATION—TRIF Regents Innovation Funds for HRAA

| | FY08 Actual | FY09 Revised Budget | FY09 Actual | FY10 Revised Budget | FY11 Revised Budget | FY12 Revised Budget |
|---|-------------------|---------------------------|-------------------|---------------------------|---------------------------|---------------------------|
| REVENUE | | | | | | |
| Carry forward | \$ 0 | \$ 489,774 | \$ 489,774 | \$ 371,771 | | |
| New TRIF Revenue* | \$ 500,000 | \$ 500,000 | \$ 500,000 | \$ 500,000 | \$ 500,000 | \$ 500,000 |
| TOTAL REVENUE | \$ 500,000 | \$ 989,774 | \$ 989,774 | \$ 871,771 | \$ 500,000 | \$ 500,000 |
| EXPENDITURES | | | | | | |
| ASU Subcontract – Biomedical Informatics | \$ 0 | \$ 300,000 | \$ 186,202 | \$ 263,798 | \$ 150,000 | \$ 150,000 |
| ASU Subcontract – AIR Registry | \$ 0 | \$ 350,000 | \$ 304,462 | \$ 220,538 | \$ 175,000 | \$ 175,000 |
| NAU Subcontract – HRAA Office/ Course Development | \$ 10,226 | \$ 339,774 | \$ 127,339 | \$ 387,435 | \$ 175,000 | \$ 175,000 |
| TOTAL EXPENDITURES | \$ 10,226 | \$ 989,774 | \$ 618,003 | \$ 871,771 | \$ 500,000 | \$ 500,000 |

* FY 2010-2012 TRIF Regents Innovation Funds are pending ABOR approval.

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PERFORMANCE MEASURES—TRIF Regents Innovation Funds for HRAA

| | FY08 Proj | FY08 Actual | FY09 Proj | FY09 Actual | FY10 Proj | FY11 Proj | FY12 Proj |
|--|--------------|----------------|--------------|----------------|--------------|--------------|--------------|
| RETURN ON INVESTMENT | | | | | | | |
| Sponsored Awards (\$ in millions) | | | | | \$5 | \$10 | \$10 |
| Grants Received | | | | | 4 | 9 | 9 |
| Grant proposals submitted to funding agencies | 1 | 1 | 8 | 3 | 5 | 32 | 32 |
| PARNERSHIPS AND COLLABORATIONS | | | | | | | |
| Research Projects Started | 1 | 1 | 6 | 4 | 6 | 8 | 8 |
| New Collaborations Between HRAA Members (Universities, Research Institutions, Hospitals, Health Plans, Healthcare Providers) | 30 | 40 | 60 | 50 | 80 | 100 | 100 |
| New Industry-University Collaborations Developed | | | 6 | 1 | 3 | 8 | 8 |
| New University-Government Collaborations Developed | 2 | 2 | 3 | 2 | 3 | 6 | 6 |
| Web Portal Hits and Links | 12,000 | 15,000 | 10,000 | 30,000 | 75,000 | 100,000 | 100,000 |
| CURRICULUM INNOVATIONS | | | | | | | |
| Courses Developed | 6 | 6 | 8 | 7 | 8 | 8 | 8 |
| Education Programs Approved | | | 2 | 2 | 2 | 2 | 2 |
| Dollars generated by curriculum (\$ in thousands) | | | | | \$20 | \$20 | \$20 |

Recommendation to the Board

It is recommended that the Board approve FY 2010 TRIF Regents Innovation Funds in the amount of \$500,000 to support the efforts of Health Research Alliance Arizona (HRAA) to secure a Clinical and Translational Science Award (CTSA) from the National Institutes of Health (NIH), as presented in this Executive Summary.