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Developing sustainable research careers for KL2 scholars: The importance of an inclusive environment and mentorship

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Introduction. The National Clinical and Translational Science Award (CTSA) Consortium 2.0 has developed common metrics as a collaborative project for all participating sites. Metrics address several important aspects and functions of the consortium, including workforce development. The first workforce development metrics to be proposed for all CTSA hubs include the proportion of CTSA-supported trainees and scholars with sustainable careers in translational research and the diversity and inclusiveness of programs.

Methods and results. The University of Utah Center for Clinical and Translational Science (CCTS), a CTSA hub, has been actively engaged in mentoring translational scientists for the last decade. We have developed programs, processes, and institutional policies that support translational scientists, which have resulted in 100% of our KL2 scholars remaining engaged in translational science and in increasing the inclusion of individuals under-represented in medicine in our research enterprise. In this paper, we share details of our program and what we believe are evidence-based best practices for developing sustainable translational research careers for all aspiring junior faculty members.

Conclusions. The University of Utah Center for Clinical and Translational Science has been integral in catalyzing interactions across the campus to reverse the negative trends seen nationally in sustaining clinician scientists. Our programs and processes can serve as a model for other institutions seeking to develop translational scientists.

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Introduction

The National Institutes of Health (NIH) recognized the inefficiencies of translational science as an important barrier limiting the advancement of preventive measures, treatments, and cures developed through research into clinical and community settings for the improvement of health. To address this problem, the NIH established the Clinical and Translational Science Awards (CTSA) in 2006 [1]. The 64 CTSA hubs are embedded in academic medical centers across the United States and serve both as individual research hubs for their regions and as components of a national consortium. In 2013 the NIH responded to a report by the Institute of Medicine by calling for collaborative efforts to increase the impact of the consortium [2]. The resulting shift in organizational design is referred to within the consortium as the CTSA 2.0. One result is the CTSA program, including principal investigators, the CTSA steering committee, and NIH staff, began to develop common metrics for the consortium [3]. A full description of all of the common metrics and how these are measured is available at: http://www.tuftsctsi.org/research-services/research-process-improvement/common-metrics-initiative/.

The common metrics focus on evaluation of critical processes and outcomes for translational research, including workforce development. Each CTSA hub is required to provide an infrastructure for workforce development, which can train numerous investigators annually in both degree-granting and mentoring programs. A common element in all CTSA hubs is the KL2 career development program for junior faculty members. The KL2 programs across the United States have trained more than 1000 scholars

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since 2006 [4]. These programs are resource intensive; yet, evaluations of best practices and outcomes of KL2 programs are limited [5].

The CTSA identified operational guidelines for common metrics in 4 areas, including careers in clinical and translational research (see: http://www.tuftsctsi.org/wp-content/uploads/2017/02/Common-Metrics-Operational-Guidelines-Careers-in-CT-Research_2.2.17.pdf). The metrics of greatest importance to workforce development are the sustainability of research careers of graduates of the CTSA-supported training programs and diversity and inclusion of the workforce. Specifically, for the KL2 program, common metrics assess the number and proportion of KL2-supported graduates who are engaged in clinical and translational research and the number and proportion who are from groups under-represented in medicine, including women, those from racial and ethnic minorities, rural backgrounds, or from low-socioeconomic-status households.

The University of Utah participated in the first wave of the common metrics pilot initiative. Our data focusing on sustainable research careers for KL2 graduates from 2008 and projected through 2016 demonstrated that 18/18 (100%) of our KL2 graduates remained engaged in clinical and translational research, with 17/18 (94%) as funded principal investigators. Our data also indicated that 14% of our graduates were from under-represented racial and ethnic groups and 36% were women. In this report, we document the factors that were important for us to achieve these outcomes.

Creating an Inclusive Environment

Over the last decade, the University of Utah has developed institutional initiatives and policies that support an inclusive environment. These have been essential to the university's success in recruiting and retaining women and underrepresented minorities (URM) in the KL2 programs and for the engagement of all faculty members. These programs and policies relevant to research-intensive faculty such as those participating in the KL2 program are highlighted in this report.

The faculty environment begins with the search process. At the University of Utah, all search committee members are trained to recognize implicit bias, including their own biases, and discussions of potential bias are encouraged within committees. Committee composition reflects institutional diversity, and for leadership searches, the Office of Faculty and Academic Affairs (OFAA) has a representative that serves on the committee. In an effort to incentivize generation of the broadest pool of candidates, the OFAA in collaboration with the Office of Inclusion offers Department Chairs financial support for searches that result in at least 1 URM candidate visiting the campus for an in-person interview. The quality of these candidates has been high, and from 2014 to 2017, 75 URM candidates have visited the University and 41 (55%) have been hired as faculty members.

Other programs that have increased inclusion both during the recruitment process and after hiring include institutional programs for educational loan reduction and for salary equity. Non-white race and ethnicity has been associated with higher educational debt burden [6] and both those from URM groups and women are at risk for salary inequity [7, 8]. The institutional loan reduction program is available to candidates on the tenure line and is based on their educational debt to salary ratio. Research-intensive junior faculty members who are participating in career development programs are eligible for loan reduction in $12,000 increments ranging from $12,000 to $48,000 and repay the loan reduction through their faculty service. For every $12,000 received in loan reduction, the faculty member commits a year of service to the institution. The Office of Faculty Development and the University of Utah Center for Clinical and Translational Science (CCTS) also support faculty candidates applying for NIH loan repayment and have a ~95% funding success rate for these programs.

To address salary equity, the School of Medicine has a standing salary equity committee. Salary equity is part of the leadership and budget evaluations of each Chair and Department annually, and all salaries below the Association of American Medical Colleges (AAMC) 25% are reviewed. Salary equity reviews for all newly hired members are conducted through the OFAA. These endeavors have resulted in greater salary equity across all departments. Both education loan reduction and a focus on salary equity are important recruiting tools for research faculty members.

Other institutional policies that support an inclusive environment for all faculty members include the availability of paid parental leave and tenure eligibility for part-time faculty members. The parental leave policy provides 6 weeks of paid leave as an additional benefit to the birth mother and/or male or female care providers of a newborn infant or adopted child. The policy is in addition to annual vacation or sick leave and can be combined with the federal medical leave act. For individuals on the tenure line, the University of Utah has a policy for part-time tenure that allows an individual in the probationary period to remain on the tenure line while working part-time. The expectation is that the part-time status will be temporary and the candidate will return to full-time work, usually within 2–4 years.

To specifically support investigator faculty members engaged in research related to health equity or disparities, the Office of Diversity annually provides funding supplements of up to 10% of the award amount for faculty members awarded institutional research funding. We have also used NIH diversity supplements to increase the pool of URM investigators in the research enterprise, with the Utah CCTS sponsoring 2 of these individuals. Finally, a comprehensive approach to mentoring—the Matrix Mentoring Model—has been developed in the health sciences center and has been associated with greater inclusion of women and URMs in the population of grant-funded investigators in the Utah research enterprise [9].

Creating a Holistic Mentoring Environment

The University of Utah has developed a formal holistic program of mentorship for clinical and translational (CAT) scholars, which has been described [9]. The program is interdisciplinary and interprofessional and supports junior faculty members with terminal degrees including M.D., Ph.D., Pharm.D., and others as they transition to principal investigators. The 2-year CAT scholar program has been associated with exceptional funding rates as 93% of the more than 100 graduates have received extramural grant funding as PIs during their time in the program. The CAT scholar program coordinates and leverages many of the resources at the University of Utah, including those in the Offices of Faculty Development and Human Resources, and the CCTS. In addition, the CAT scholar program provides services for all junior faculty committed to research careers. All KL2 scholars supported by the CCTS and all other career development awardees at the University of Utah are enrolled in the CAT scholar mentoring program. Annually, ~20–25 faculty scholars are selected from a competitive applicant pool to participate in the CAT scholar program. The cohort of up to 50 junior faculty scholars creates a critical mass community for these investigators and an economy of scale for the institution.

Within the CCTS, the CAT scholar program contracts for support services offered through the foundations and cores, including biomedical informatics, study design, statistical support, and community engagement consultations. CAT participants also use the resources of the master of science in clinical investigation program (MSCI). Of the 18 recent KL2 graduates, 33% completed a MSCI degree and 56% took

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up coursework through the program without obtaining a degree. KL2 awardees and CAT scholars also participate in a K club sponsored by the CCTS, in which they are able to receive feedback from peers and senior faculty members on proposed research endeavors. The CCTS also sponsors NIH-style peer-review, which is available to all KL2 awardees and others in the CAT program.

Finally, the University of Utah has committed significant support for mentoring, which has been a key to the success of our junior faculty members including those in the KL2 program. All mentors who support federally funded trainees through K or T programs, including those on the KL2, receive formal mentor training through the CAT program. Mentoring is formally recognized in the promotion and tenure guidelines at the University of Utah and can be credited as either education or service. Historically, the mentors for those in the CCTS KL2 program have received 5% of their salary up to the NIH cap from the institution to support their mentoring efforts.

Conclusions

In summary, we attribute much of the exceptional sustainability of Utah CCTS KL2 graduates as principal investigators to institutional factors. We have focused on creating an inclusive environment for faculty members. This environment allows us to recruit and retain investigators embracing diversity of ideas and thought, which in turn creates a rich environment for discovery and investigation. The inclusive environment is enhanced by a holistic approach to mentoring that recognizes the vital role of mentors and rewards their efforts through faculty development, advancement, and salary support. Future work will establish how durable the holistic mentoring is across the career trajectory. The CCTS has been integral to catalyzing the interactions across the campus to reverse the negative trends seen nationally in sustaining clinician scientists. Our programs and processes can serve as a model for other institutions seeking to develop translational scientists.

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Conflicts of Interest

None.

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