

## Shifting the Paradigm: Reimagining Approaches to Diversifying the Leadership of the Nation's Cancer Centers

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The National Cancer Institute (NCI), the world's largest funder of cancer research, was established by the 1971 National Cancer Act in declaration of a federal commitment to fighting the "war on cancer," a disease that ranked as the second leading cause of death in the United States at the time (1). This law also commissioned the development of a network of cancer centers across the country that would coordinate national and regional efforts to reduce the cancer burden. In the 50 years since the law's enactment, vast progress has been made in the development of lifesaving technologies for the early detection and treatment of cancer (2,3), and the NCI-designated cancer centers (4) have been foundational to the research, dissemination, and clinical delivery of such cutting-edge innovations. Largely affiliated with university medical centers, this consortium of NCI-funded centers is tasked with tailoring cancer care programs and services to the needs of their local communities. Because of demographic shifts, populations that cancer centers serve have become less uniform over time, ranging in racial and ethnic, socioeconomic, and cultural background. On the frontlines of cancer care across the continuum, cancer centers have faced challenges in directing research programs, clinical activities, and community engagement customized to an evolving population. One potential underlying factor increasing the difficulty in serving increasingly diverse populations is the remarkable lack of diversity in cancer center leadership (5), reflective of underrepresentation in the broader biomedical workforce.

As a whole, the US health system has struggled to equitably address the specific health needs of diverse populations. Long-acknowledged cancer health disparities persist, and many have been exacerbated during the global COVID-19 pandemic (6). Socioeconomic inequalities in cancer mortality widened, especially in preventable cancers like breast and colorectal cancers (7), and the racial gap in cancer deaths narrowed only slightly. Despite decades of scientific advancements, progress toward eliminating cancer inequities has been markedly slower. After a half century of massive public and private financial

investments in oncology (8-10), cancer remains our nation's second leading cause of mortality (11). In other words, the battle against cancer rages on, and victory is clearly not yet within our reach.

With President Biden reigniting the Cancer Moonshot to end cancer (12), in this issue of the Journal, Lerman et al. (13) emphasize that properly fortifying and equipping ourselves as a part of these renewed efforts must involve diversifying and developing cancer center leadership alongside the appropriate supports helping leaders navigate the increasingly complex roles of cancer centers. The authors highlight that lack of diverse representation in cancer center leadership has taken a toll on effectively deploying the resources of cancer centers to reduce cancer disparities in their catchment areas. They further note that a gap exists in knowledge and development of leadership skills during traditional clinical or biomedical research training, which has hindered targeting programs and services successfully, particularly those that might alleviate inequities in cancer care experienced by underrepresented and medically underserved populations. A series of initiatives were proposed to build a pipeline of emerging leaders who are reflective of the diverse groups served by these institutions and are well positioned to succeed.

To make the diverse leadership pipeline within cancer centers a reality, challenges to diversifying the workforce faced specifically within matrixed cancer centers (embedded in university settings) merit greater consideration alongside the call to action issued. First, the survey results presented in Lerman et al. (13) illuminating a lack of diversity among current research program leaders and associate directors in cancer centers must be contextualized with a discussion of the tenure track—the pathway to promotion and job security within a university (ie, higher education institution). Particularly within matrixed cancer centers, having academic standing as a tenured faculty member is a common prerequisite for appointment to program leader and associate director roles, yet tenure-track

positions are becoming increasingly scarce (14-18). Furthermore, vast inequities in the tenure-track system lead to high attrition rates and a lack of representation in academia of diverse tenured faculty from underrepresented minority (URM) groups (14-18). This creates an inherent structural problem with the traditional cancer center leadership pipeline whereby the pool of URM faculty deemed eligible for leadership roles will be limited and likely necessitate the inclusion of nontenured members.

Investments in early stage investigators as future center leaders may come at a risk because of their impermanent positions. Early investigators' investments into participation on such a cancer center leadership track may divert from the research pursuits necessary to garner tenure and protect their institutional longevity. The leadership development and training programs along with opportunities to serve on grant review panels and lead or co-lead task forces or committees that Lerman et al. (13) propose provide invaluable opportunities to acquire the skills needed in cancer center leadership for early career stage and pretenure. However, for junior faculty and early stage clinician scientists, these come with a notable opportunity cost of time and energy that could be directed toward development of a scholarly track record via impactful publications and a funding pipeline to support an independent research program. Such a history and trajectory of scholastic achievement likely led to the identification of these members for the leadership track to begin with, and its continuation is crucial to maintaining their eligibility for senior leadership roles. Progressive elevation of the responsibilities or time commitments associated with the cancer leadership track could also add to the burdensome "minority tax" for URM emerging leaders if not synergized with the 3 main pillars typically evaluated for tenure: research, teaching, and service.

Given these realities created by the university tenure-track system, matrixed cancer centers seeking to diversify their senior leadership must take intentional actions to align leadership development with achieving scholarly benchmarks, lowering the barriers to participation on a cancer leadership track. Those steps could include, but are not limited to 1) instituting mentorship programs to better connect cancer center members at all levels to foster collaborations; 2) engaging cancer center members, especially early career researchers, who have leadership potential with a customized career needs assessment and development plan to balance academic responsibilities with the cancer center leadership track; 3) providing cancer center members, especially early stage investigators, in the leadership pipeline with guidance in grant preparation and grant support to obtain independent research funding; 4) creating positions such as assistant program leaders where nontenured and early career members will have formalized, delineated roles within the cancer center that offer an on-ramp to leadership responsibilities commensurate with career stage; and 5) offering internal and external visibility for emerging cancer center leaders, which could include leveraging cancer center networks to provide opportunities for talks within the university and around the nation. For example, cancer centers could coordinate a rotating speaker series to offer emerging leaders opportunities to travel across sites and present research in progress or completed work. This visibility would not only serve the academic purpose of building the scholarly reputation important for tenure but also allow members on the leadership track to begin assembling a collegial network to pull on in future leadership positions.

Cancer centers will require support from the NCI and major cancer research funders, including philanthropy, to use the

complete array of policy levers at their disposal to increase the diversity of cancer leadership. Diversity, equity, and inclusion (DEI) must be central to the mission of NCI-designated cancer centers and financially supported to advance efforts tackling cancer disparities. Some of this work has already been initiated as the newly issued NCI request for applications to receive Cancer Center Support Grant funding requires a Plan to Enhance Diversity, which must detail strategies to "enhance participation of women, minorities, and individuals from groups nationally under-represented in the research workforce, center leadership, and advisory boards" (19). Increasing Cancer Center Support Grant funding and specifically earmarking funds for DEI programs and activities would assist in catalyzing long-overdue change.

Major investments in discovery science have spurred the rapid evolution of the treatment landscape in oncology (2,3), however, funding opportunities must be further extended to research areas beyond the basic sciences to include fields investigating health disparities and those comprising the team-based and application sciences that have been historically undervalued: patient-oriented translational research, health policy and health services research, public health sciences, and implementation science. These fields are critical for the translation of scientific discoveries to health policy and/or clinical guidelines. Funding mechanisms place fields on the national research agenda and signal their value to the broader biomedical community. URM researchers comprise large proportions of the scholars contributing to these underfunded areas, which are often viewed as less competitive than traditional basic sciences. To fully enfranchise these undervalued areas of research suffering from historical disinvestment, evaluations of scientific impact of NCI-designated cancer centers must expand beyond publications in high impact single-name journals like *Nature* and *Science*, which traditionally do not publish work from these research areas. Moreover, increased funding for proposals that support more large-scale collaborative opportunities like Research Program Project grants (P01s) and Specialized Programs of Research Excellence (SPORs) in these particular research areas is urgently needed to accelerate progress in eliminating cancer disparities and translate scientific innovations to benefit our nation's increasingly diverse population and address the global burden of cancer in an interconnected world. Specifically, scientific breakthroughs can come from underserved and understudied populations in the global south, yet global cancer research has not been fully embraced as a strategic field of research in our national interest (20,21). Cancer center leadership should foster international partnerships and opportunities for the next generation of early career researchers to explore creative and innovative solutions that promote equity in biomedical research by advancing new fields such as data science, artificial intelligence, chemical biology, metabolomics, climate science, and molecular engineering, to mention some emerging areas relevant to global cancer research.

The consortium of federally funded NCI-designated cancer centers is incredibly unique in its extensive reach into diverse communities and a powerful tool to maintain US leadership in global science and technology (22) in continuance of the war on cancer with a bold ambition to win. We are currently in a period of leadership revitalization at the National Institutes of Health and the NCI, providing a critical window to begin charting a path where future turnovers can pull from a cadre of leaders from diverse backgrounds already prepared to seamlessly assume and fulfill those roles. Victory in an entrenched war spanning decades will require the best prepared forces on all fronts.

After decades of systemic sex and racial bias in biomedical research, addressing workforce and leadership equity across the cancer continuum from basic to population science deserves urgent attention. To truly shift the paradigm, national policy will be essential to incentivize and foster the reimagining of approaches to diversifying the leadership of the nation's cancer centers. From the top down, these policies must facilitate growth in DEI at multiple levels to establish a sustainable pipeline for diverse cancer leaders that can direct innovation and make dynamic adjustments to better serve the needs of an evolving American population.

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