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Understanding and Reducing Obstacles in a Collaboration between a Minority Institution and a Cancer Center

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Summary

Reducing the cancer incidence and mortality rates of underserved populations will require multidisciplinary efforts involving teams of diverse investigators. We describe a collaborative program between a National Cancer Institute-designated cancer center and a minority-serving institution. The organizations worked together to discover institutional and cultural barriers and facilitators to productive collaboration.

Collaborative, team, and multidisciplinary research structures have been proposed by many federal agencies as necessary to solve complex challenges for our society, including health disparities experienced by underserved groups. Yet the components of successful collaborative partnerships are rarely reported. The expectation that there are no cultural differences that could negatively impact collaborative programs between institutions or between scientific disciplines is naïve. In fact, academic disciplines have been equated with social “tribes” with all of the attendant features of tribal customs, values and norms.¹ At least two key domains have been proposed to influence the success of large scale collaborative efforts: well developed scientific sub-disciplines (epistemic factors) and/or well developed organizational structures.² Finally, the critical role of communication has also been described for success in inter-institutional partnerships.³ In this paper, we explore some institutional and cultural factors that served as both barriers and facilitators to productive collaboration using the example of a National Cancer Institute (NCI) supported partnership focused on cancer health disparities.

Developing a Partnership

In 2000, the NCI initiated the Minority Institution/Cancer Center (MI/CC) collaboration to link minority-serving institutions—institutions with a majority of under-represented students—with NCI-designated cancer centers.⁴ The NCI supported these MI/CC partnerships at two different phases, as a U56 planning-level award and as a U54 development-level award. The

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New Mexico State University (NMSU)/Fred Hutchinson Cancer Research Center (FHCRC) U56 partnership was funded from June 2002 through September 2007 and the U54 partnership was funded from September 2007 through August 2013.

For the past 10 years, NMSU and the FHCRC have worked together to increase cancer research, training, and outreach capacity at NMSU through scientific collaborations and other partnership activities, such as training, career development review, and grant writing workshops. Simultaneously, the FHCRC has increased the number of underrepresented individuals who receive training in cancer research and cultivated collaborative research initiatives to reduce cancer health disparities among underserved population groups.

Differences in institutional missions, values, and cultures presented challenges to the partnership. Table 1 summarizes a few of the characteristics of each institution. While NMSU values teaching at the undergraduate and graduate levels, FHCRC emphasizes research and advanced scholarship. The NMSU student body is diverse, with many members from underserved groups, but lacks the expertise and experience to recruit and train these students in cancer research, something the FHCRC does very well. The FHCRC has limited access to underrepresented populations for its projects, while NMSU has access to a broad spectrum of such individuals. Approximately 1,800 miles apart, NMSU and FHCRC have very different climates and environments, in every sense of the word. Despite differences in institutional missions, there is a strong alignment on the appropriate targets for health outreach programs by both institutions.

Early challenges and their resolutions

The collaboration between NMSU and the FHCRC began *de novo*, that is, there were no joint activities existed prior to writing of the U56 application. An initial barrier was the geographic distance between the institutions, which presented challenges for communication. Communication via phone and email was helpful, but we recognized that body language often more accurately reflects emergent relationships. As NMSU had much experience with video teleconferencing and the FHCRC was also accustomed to its use, it became a valued communication network, and continues to be one to this day.

The U54 grant requires that all projects have at least one investigator from each of the two institutions. Because a project may only last for a maximum of three years, the U54 periodically issues a Request for Applications [RFA] among faculty within the two institutions. Prospective collaborators are identified by the co-Principal Investigators (co-PIs) of the partnership and relationships are further refined following phone conversations and email correspondence and eventually, by in-person meeting(s) at the partner institution. Established collaborators and prospective partners noted the distance between institutions was a barrier to forming strong research relationships. In response, both institutions earmark travel funds to foster viable research partnerships.

Cultural differences between the two institutions emerged early in the partnership. As NMSU is primarily a teaching institution, faculty involved with the partnership experienced conflicting demands on their time, at least partially because of the expectations for teaching. Many, though not all, found inadequate time and resources for the research part of the

endeavor. This was remedied by discussion between the NCI Program Officer and the NMSU administration. First, the grant was placed under the management of the Vice Provost for Research, rather than in individual departments. This allowed an institutional ruling that for every 25% effort placed on a partnership grant, a faculty member would buy out of teaching a course. With centralized administration, it became easier to adhere to this rule. Department heads could use the salary dollars provided by the grant to hire alternate instructors for the course the U54 researcher would no longer teach.

Among FHCRC faculty, there was a feeling that scientific expectations were high given the amount of the funds awarded. For example, for each pilot grant, the amount per year was \$120,000 to be split between the two partners. Full proposals were awarded up to \$275,000 a year split between the two partners. Awards were made for a maximum of three years. Investigators at the FHCRC, although accustomed to larger grants, saw this as a reasonable amount of money for pilot work. Further, many were intrigued by the possibility of working with partners who had different but complementary skills.

The co-PIs of the collaboration, along with their administrative assistants, met on a number of occasions to discuss and resolve the challenges that occurred during the first five years of the U56 award. The resolution of these challenges was also facilitated by two advisory committees for the collaboration: the Internal Advisory Committee (IAC) and the Program Steering Committee (PSC). The IAC is comprised of senior faculty at both institutions (FHCRC and NMSU). They meet semi-annually to review progress of individual projects and evaluate the extent to which the collaboration is meeting its overall goals and objectives. The PSC is comprised of nationally known experts in cancer research, all from external institutions. The PSC meets annually to review the progress of individual projects and the overall collaboration.

Research Success

The specific aims of the U54 partnership are: 1) to increase the capacity of NMSU to conduct competitive research; 2) to create a long-standing partnership in cancer research training and education; and 3) to bring public health intervention to communities suffering from cancer health disparities. The productivity of the NMSU/FHCRC partnership is quantified by objective parameters including research scholarship reflected in journal articles and funded grants and training productivity as reflected in the number and career progression of trainees (Figure 1, Table 2). Over the past 10 years 53 new grants were awarded and 80 coauthored manuscripts were published. The production of publications has increased steadily since 2004 (Figure 1). Students were co-authors on 59 of these manuscripts and first authors on 33 manuscripts.

Training Success

An outcome of our second specific aim is to increase the number of underrepresented students who go on to pursue careers in science or medicine with an emphasis in health disparities research. As a measure of that career progression, we tracked the trainees in our program since its inception. Over the lifetime of the partnership, 301 NMSU undergraduate students and 17 NMSU graduate students were associated with either formal U54 training

programs or independent research projects. Of the NMSU undergraduate students who participated in a U56- and/or U54-sponsored training program and graduated, a large percentage (65%) entered post-graduate programs (See Figure 2).

Outreach Success

At the onset of the partnership there were no outreach programs for cancer health disparities at NMSU. During the U56 award period, one project to determine compliance for colorectal screening among at risk rural New Mexicans in southern NM was conducted. During the U54 award five additional outreach projects were conducted on a range of topics: e.g., compliance for cervical cancer screening; use of *promotoras* in rural cancer health care; and exposure to heavy metal pollutants. The U54 program at NMSU now supports an NCI Community Health Educator who is primarily working with rural communities throughout NM providing bilingual health promotion and cancer education programs.

Career development of junior investigators

A measure of success is seen in the activities of the Mentoring Committee. A good mentoring program is one that has: specified goals; good matching of the mentor with the mentee; monitoring of the mentorship process, and evaluation of results.^{5,6} The Mentoring Committee has experience in a variety of content areas and with a great number of grant mechanisms. This allows the mentees to relate to the committee and the committee to provide appropriate mentoring for almost all situations. The committee does not take over the role of individual mentors, but rather acts as a safety net to ensure that mentees receive the best advice and guidance possible to become successful scientists.

As mentorship became a key and relevant part of the collaboration, the Mentoring Core assumed other responsibilities. Annually, two or three members of the Mentoring Core review concept papers for manuscripts or grants written by junior faculty. This provides valuable feedback and advice for faculty, who are submitting their first R01 proposal or other grant applications, as well as improving the quality of manuscripts that are being submitted. The final result of the mentoring process is growth as a successful scientist; junior investigators graduate from mentee status by securing independent external funding, a metric that may take several years. For intermediate markers of success, the partnership tracks publications and grant submissions by junior faculty.

“Study Section” Review Process

The collaboration also created an NIH styled *study section* approach to review proposals submitted internally. Close to 40 proposals were reviewed by this mechanism. Modeled on NIH’s study section, reviewers evaluate and provide substantial feedback on all proposals. For those proposals not funded by the collaboration, the feedback provided by the study section has been valuable in helping investigators revise their applications and submitting them to alternative funding sources.

Release Time

Junior faculty stated that time to write manuscripts was a limiting factor. In response, we developed a policy to provide salary support up to 25% release time for a semester for partnership faculty, with the expectation that a co-authored manuscript (featuring both partners) would be written and submitted for publication to a journal. Within the first two years of the U54 award, four junior faculty used this option and each published at least one manuscript.

Institutional Memorandums of Understanding (MOU)

To facilitate partnership research activities, the PIs worked with their respective institutions to develop two important MOUs: an MOU covering reciprocal Institutional Review Board approval to decrease the time to process requests for Human Subjects Research approvals, and an MOU on partnership conflict resolution policy. This policy is also provided to all partnering researchers and is a good place for them to initiate discussions about manuscript authorship.

Cancer Teaching Fellows

The partnership has developed a novel program to increase the cultural competency of FHCRC post-docs for teaching, called the Cancer Teaching Fellows program. Over the past five years, nine post-docs interested in academic positions were trained to present a week of interactive and effective classroom instruction in an NMSU undergraduate cancer biology course. They participated in office hours and crafted a teaching philosophy statement with feedback from senior faculty at NMSU.

Conclusions

Not all institutional partnerships will experience the barriers faced by the NMSU/FHCRC collaboration. Box 1 lists key lessons learned following 10 years of effort to establish a productive partnership. Cultural differences at the institutional level may be common among other types of partnerships. Cancer Centers that focus on research may misunderstand the time commitments of colleges and universities that emphasize teaching. Similarly, faculty from CCs may not understand why a partner delays writing a paper or a grant proposal. Our finding that teaching took top priority at the MI helps explain that phenomenon. Respect for each institution and its mission is an essential part of a successful partnership.

Box 1

Lessons Learned

- Respect for each institution's mission is essential; as success is defined differently at an MSI or at a CC.
- Training and mentoring however, are valued by both institutions and should be included in most partnership activities.

- Given the underappreciated cultural differences between partnering institutions and units, specific attention to communication is essential. Strong partnerships are built slowly between scientists with complementary skills.

The NMSU/FHCRC partnership is not unique in undergoing growing pains and significant time has been devoted to addressing these challenges. Our partnership demonstrates that the investment by NCI in fostering collaboration between a cancer center and a minority serving institution can and has produced demonstrated research outcomes, increased numbers of diverse trainees, and increased attention to cancer health education.

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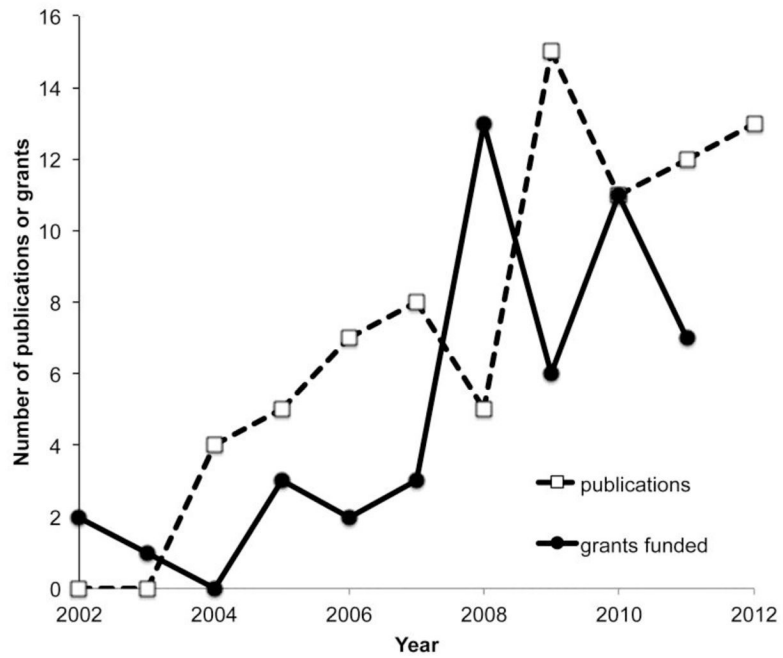


Figure 1.
Number of collaborative publications and grants funded during U56 and U54 award periods;
U56 support June 2002 – Sept 2007; U54 support Oct 2007 – Aug 2012.

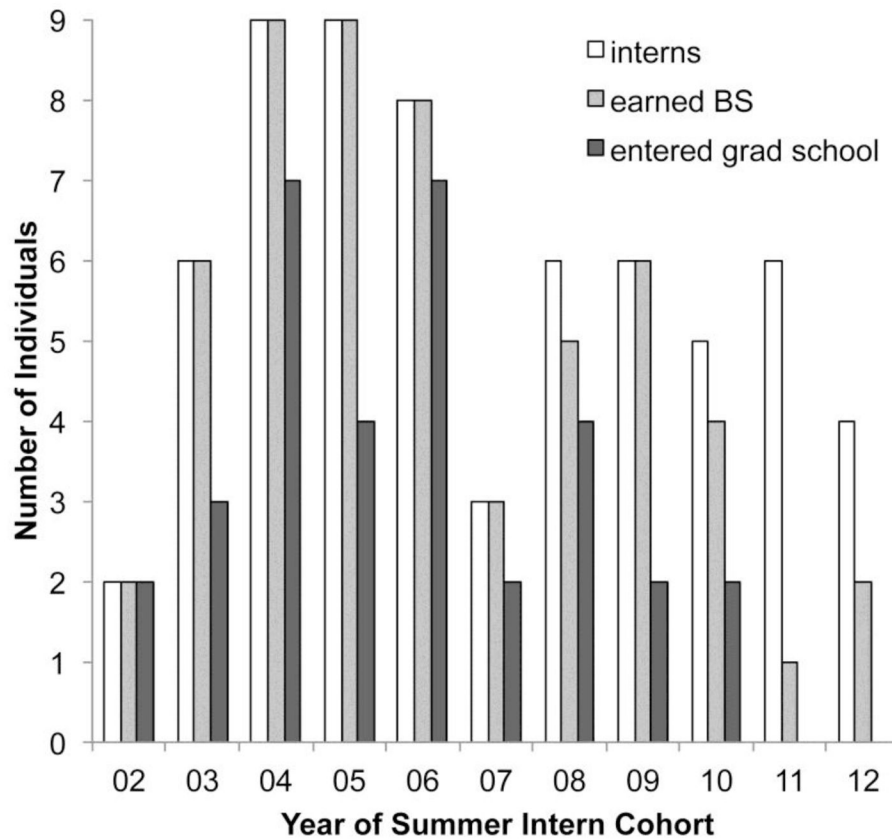


Figure 2. Career progression of undergraduate summer interns reported as cohorts

The number of interns (open bars), number who earned BS (light grey bars), number who entered post-graduate programs (dark grey bars); U56 supported interns from 2002–2007, U54 supported interns from 2008–2012. **Note:** We recruited few interns in summer 07, the last year of our U56 award, because we had no information on the funding status of our then-pending U54 application.

Table 1

Characteristics of Partnering Institutions

Characteristic	New Mexico State University ^a	Fred Hutchinson Cancer Research Center ^b
Institution type	Comprehensive land-grant institution of higher learning; NASA Space Grant College; Hispanic-serving institution	Non-profit research organization; National Cancer Institute designated Comprehensive Cancer Center; home to three Nobel Laureates
Number of employees	4,350	~3,000
Number of students	18,024	0 (grad students enroll at UW)
Annual Budget	\$644.5 M	\$435.5 M
Annual Research Budget	\$242 M	\$336 M
Diversity of Employees (% URM)	35.9%	12.2%
Diversity of Students (% URM)	53.5%	n/a
Degree programs –		n/a
• Doctoral	24	
• Masters	53	
• Baccalaureate	86	
Number of Administrative Units	10 colleges and library, 51 academic departments	5 divisions, 200+ labs
Size of campus	900 acre main campus in Las Cruces; 12 off campus science centers for agricultural, ranching and livestock research throughout NM; 32 county Extension offices; 4 branch campuses for associate degree programs	15 acres on Lake Union in Seattle
Mission	NMSU is the state's land-grant university, serving the educational needs of New Mexico's diverse population through comprehensive programs of education, research, extension education, and public service.	The mission of FHCRC is the elimination of cancer and related diseases as causes of human suffering and death. The Center conducts research of the highest standards to improve prevention and treatment of cancer and related diseases.

^a <http://irpoa.nmsu.edu/QuickFacts/2011fb.pdf> and institutional reports.

^b <http://www.fhcrc.org/en/news/annual-report.html> and institutional reports.

Table 2

Outcomes of NMSU/FHCRC collaboration from 2002 to 2011.

U56 (05/2002 to 09/2007)	Project Year 1	Project Year 2	Project Year 3	Project Year 4	Project Year 5
Collaborative projects ^a	6	6	6	5	3
Basic Research	4	4	4	4	2
Population Research	0	0	0	0	0
Training	1	1	1	1	1
Outreach	1	1	1	0	0
Junior Faculty mentored	2	3	2	6	5
Student trainees ^b	8	28	31	34	36
Post-docs, Cancer Teaching Fellows	1	1	2	2	1
U54 (09/2007 to 08/2012)	Project Year 1	Project Year 2	Project Year 3	Project Year 4	Project Year 5
Collaborative projects ^a	7	11	11	11	6
Basic Research	4	6	6	5	1
Population Research	0	0	0	1	1
Training	2	2	2	2	2
Outreach	1	3	3	3	2
Junior Faculty mentored	6	6	6	5	6
Student trainees ^b	34	66	47	59	18
Post-docs, Cancer Teaching Fellows	3	5	7	6	4

^a Full, pilot, and pre-pilot projects;^b Summer interns, BEC trainees, Post-bac fellows, Undergraduate and Graduate students.