

ACHIEVING A DIVERSE NEUROSCIENCE WORKFORCE

NINDS Advisory Panel for Workforce Diversity

Zach W. Hall, Ph.D., Emeritus Professor, UCSF (Chair)

Emery Brown, M.D., Ph.D., Professor, MIT/Harvard

Edwin Barea-Rodriguez, Ph.D., Professor, University of Texas at San Antonio

Anne M. Etgen, Ph.D., Professor, Albert Einstein College of Medicine

Byron D. Ford, Ph.D., Professor, Morehouse School of Medicine

Lee Limbird, Ph.D., Professor, Vanderbilt University Medical Center

Eve Marder, Ph.D., Professor, Brandeis University

Luis Santana, Ph.D., Professor, University of Washington

CONTENTS

Executive Summary	3
Introduction	3
General Considerations	4
Summary of Recommendations	5
General Considerations	9
Findings and Recommendations for NINDS Diversity Programs	12
Extramural Programs Directed to Individuals	12
Extramural Programs Directed to Institutions	15
Diversity in the NINDS Intramural Program	19
Internal Administration of NINDS Diversity Programs	21
Cooperation with Other NIH Institutes and Centers (ICs)	23
Evaluation and Accountability	24
References	26
Appendix A	27

EXECUTIVE SUMMARY

“A richly diverse America does not await us, it is upon us; it is our present and our future”

Susan Hockfield, Ph.D., President, Massachusetts Institute of Technology

NIH shall “provide for an increase in the number of women and individuals from disadvantaged backgrounds (including racial and ethnic minorities) in the fields of biomedical and behavioral research”

NIH Revitalization Act, 1993

INTRODUCTION

The remarkable diversity of our country is one of its great strengths. The varied backgrounds and experiences of our country’s population is an extraordinary resource whose potential can only be realized by fully engaging the talent, intelligence and drive of all of its members, regardless of race, ethnicity, cultural or economic background, or disability. The need to engage diverse individuals in the solutions of societal problems is heightened by the projected increase in the relative proportion of racial and ethnic minorities in the U.S. population – by 2020, it is anticipated that almost 40% of the population will be minorities (U.S. Census Bureau, 2008). The importance of recruiting diverse talents is particularly relevant for research on the nervous system, which draws on a wide range of expertise in multiple scientific and academic disciplines - from engineering and computation, to molecular, cell and systems biology to social science and clinical medicine - as it seeks to understand and ameliorate the major burdens of neurological disease. Achieving a diverse neuroscience workforce will both aid neuroscience research generally and be a potent factor in reducing health disparities.

The lack of diversity in the scientific workforce of the United States is well documented (NAS NRC, 2005; Nelson and Brammer, 2010). For example, the proportion of underrepresented minorities (African-American, Hispanic, Native American) in science and engineering faculties of the top 50 research universities (Nelson and Brammer, 2010) and in medical school faculties (Sullivan Commission, 2004) is less than 5%, falling far below their estimated combined representation in the U.S. population - approximately 29% in 2007 (U.S. Census Bureau, 2007). The neuroscience workforce is no exception. In 2007, the membership of the Society for Neuroscience, which includes students, fellows, researchers and those in research-related

occupations, was estimated to include 2% African-Americans, 4% Hispanics, and less than 0.5% Native Americans and Pacific Islanders combined (personal correspondence, Society for Neuroscience). The National Science Foundation Survey of Earned Doctorates (2008) and the Association for Neuroscience Departments and Programs website report similar figures. The most relevant and revealing figures, however, arise from an analysis of NINDS grantees. Over the years 2005-2009, the percentage of NINDS grantees with R01 or equivalent awards who were African-American was 0.4-0.5%; the percentage of Hispanics was 0.6-0.7%; and the combined percentage of Native Americans and Pacific Islanders was 0.1% (see Appendix A). The message from the data is clear: these minorities are virtually absent from the neuroscience workforce.

NINDS, in agreement with the congressional injunction quoted above, seeks to increase diversity in the neuroscience workforce. During the last several decades, NIH, and the NINDS in particular, have instituted a number of programs directed at individuals and institutions whose purposes have been to encourage underrepresented minority (URM) individuals to undertake research careers and to strengthen the research effort at predominately minority institutions. Our Sub-Committee was charged to examine the current NINDS investment in nurturing diversity in the neuroscience workforce, and to make recommendations for current and future programs that will further the goal of NINDS to engage all segments of our society in the effort to reduce the burden of neurological disease.

GENERAL CONSIDERATIONS

Before evaluating the current NINDS programs and making recommendations, the Sub-Committee discussed a number of relevant issues for increasing the diversity of the neuroscience workforce and agreed on several general principles that would guide our subsequent discussions.

- 1. There is a continuing need for programs focused on increasing diversity at multiple stages of career development for neuroscience researchers.*
- 2. An effective program to increase diversity among neuroscience researchers must address the needs of individuals in both majority institutions and minority-serving institutions (MSIs). Programs for institutional strengthening are particularly needed in the latter venue. Both URM individual and MSI institutional support are important in achieving increased diversity in the workforce.*
- 3. Programs for active, dedicated mentorship of URMs are needed at every level for both individuals and institutions. Such programs must include, and be accountable for, a plan for mentorship of their trainees and faculty.*

4. *The recognition that important contributions to neuroscience research are made by those in a variety of research-related careers, and in a variety of settings, should inform both our expectations and evaluations of programs designed to increase diversity.*

SUMMARY OF RECOMMENDATIONS

NINDS Diversity Programs Directed to Individuals

- Kirschstein NSRA Pre-doctoral Fellowship Awards to Promote Diversity in Health-Related Research (F31)
- Research Supplements to Promote Diversity in Health-Related Research
- Career Development Award to Promote Diversity in Neuroscience Research (K01)
- Collaborative Neurological Science (CNS) Awards (S11)

The programs for individual trainees have been generally successful, and the Sub-Committee recommends that they be continued with particular attention paid to effective mentorship and to institutional commitment. In addition, we recommend that NINDS institute a diversity component for individual post-doctoral fellowships similar to that for Kirschstein awards.

Recommendations:

1. *Continue the Diversity F31 Awards, the Administrative Supplements and the CNS Awards at their present levels. The Administrative Supplement Awards should be linked explicitly to provisions for strong mentorship and enrichment in addition to the opportunity for laboratory experience.*
2. *Increase the number of K01 awards and give them a broader scientific scope. We also suggest an increased emphasis on institutional support for prospective awardees.*
3. *NINDS should invest resources to track the career paths of prior awardees in these programs. Develop and implement immediately an effective plan for monitoring and tracking all future awardees.*
4. *Establish an F32 Diversity Program for Post-Doctoral Fellows.*

Current NINDS Institutional Programs

- Pre- and Post-doctoral Training Program for Institutions (T32)
- Neuroscience Scholars Program (R25)
- Specialized Neuroscience Research Program (SNRP) (U54)

The Sub-Committee recommends that the R25 Program be continued and that the diversity requirement for institutions receiving pre- and post-doctoral training funds be strengthened. Although the SNRP program has had many successful outcomes, the Sub-Committee recommends several fundamental changes to strengthen the overall program. Finally, the Sub-Committee recommends that NINDS consider a new institutional training program directed at clinical training in health disparities research. Both majority institutions and MSIs would be eligible to apply for such programs.

Recommendations:

- 1. Require that NINDS T32 awardees have a demonstrated record of success in diversity and that structured mentorship be an integral part of the training program.*
- 2. Decrease the number of SNRP awards so that NINDS investment focuses on the most successful programs.*
- 3. Refocus the SNRP initiative on the original goal of the program: to develop centers of research excellence in basic and/or clinical neuroscience at MSIs.*
- 4. Reconfigure the policies, anticipated pathway, and expected milestones of the SNRP program to reward success and to better accommodate different stages of growth.*
- 5. Require strong leadership and a strong Scientific Advisory Committee as prerequisites for a SNRP award.*
- 6. Allow SNRP programs that are sufficiently mature to add a teaching or educational component to their activities to attract minority students to neuroscience research.*
- 7. Consider establishing an initiative to support training programs for early career clinical investigators in health disparities-related neuroscience research at qualified institutions including, but not limited to, MSIs.*

Diversity in the Intramural NINDS Research Program

- NINDS Summer Internship Program in the Neurological Sciences (SIP)
- NINDS Faculty, Pre- and Post-Doctoral Trainees

Efforts to increase diversity through the Intramural Program have been widely divergent. On one hand, the summer training program has been a model for such programs, both at NIH and elsewhere. On the other, there appears to have been little institutional commitment or concerted effort to increase diversity within the Intramural Program, either for trainees or for faculty.

Recommendations:

- 1. Continue the highly effective Summer Internship Program. We urge that an NINDS faculty member be added to the leadership of the program and that the subsequent careers of trainees be tracked for purposes of program evaluation.*
- 2. The NINDS Intramural Program should make minority research training and career development a clear priority and, under the leadership of NINDS faculty, should develop Institute-wide programs to recruit and mentor minority trainees at the pre-doctoral, post-doctoral and investigator levels.*
- 3. Establish an Institute-wide database as part of the diversity program development that would track trainees and faculty and provide the basis for program assessment.*
- 4. Wherever possible, coordinate these programs with extramural diversity efforts.*

Internal Administration of NINDS Diversity Programs

The Sub-Committee believes that combining administrative responsibility for health disparities and for workforce diversity has not served the goals of either program, and that they should be separated. In the body of the report we suggest several alternatives for reorganization.

Recommendations:

- 1. Formally separate administrative responsibility for NINDS diversity programs from responsibility for health disparities.*
- 2. Reorganize and refocus the diversity programs for training, career development and enhancing institutional infrastructure.*
- 3. Whatever administrative structure is adopted, we urge that diversity staff work closely with relevant scientific officers and with Institute review staff.*
- 4. Consider the establishment of an external advisory group that would include NINDS Council members and meet periodically to evaluate and review NINDS diversity programs.*

Cooperation with other NIH Institutes and Centers (ICs)

The Sub-Committee supports collaborative programs with other ICs and recommends that efforts be made to coordinate information and diversity programs across NIH.

Recommendations:

- 1. NINDS should encourage and support collaboration with other NIH ICs in their diversity programs.*
- 2. Perform an investment/asset analysis to organize information across NIH about programs that foster diversity in the biomedical workforce, to serve as the basis for further strategic planning and multiple IC investment. Establish a single NIH website available to individuals and institutions that is devoted to NIH programs to foster minority investigator career development.*

Evaluation and Accountability

The Sub-Committee believes that the lack of outcome information for NINDS programs aimed at increasing diversity has been a major impediment to the effective evaluation and modification of these efforts. We urge a major commitment to the development of a database and tracking system with designated program evaluation experts to regularly assess and report on these programs to Institute leadership.

Recommendations:

- 1. Establish a relevant set of metrics for success of minority training and career development programs and use these metrics to develop a comprehensive database and tracking system for all individuals in NINDS diversity programs, along with a reference group.*
- 2. Designate or recruit program evaluation experts to facilitate on-going assessment of minority training and career development programs with periodic reporting to Institute leadership.*

GENERAL CONSIDERATIONS

Critical transitions in career development

Identification of the career stages (high school, college, graduate or professional school, post-graduate training, first job, tenure and promotion, first grant) at which diversity of the potential neuroscience workforce decreases can help guide effective programmatic development. The available studies, as well as the experience and anecdotal knowledge of the sub-committee members, suggest that there are barriers to diversity at each stage of career development. Ginther et al (2009), using national databases to compare racial and ethnic representation at different academic career stages, pinpoint the progression from high school to college and from college to graduate school as significant transitions at which diversity decreases. The data provided by NINDS on URM representation in pre-doctoral and post-doctoral NIH fellowship awards (NIH, Office of Extramural Research, 2009), a transition not addressed in the Ginther report, shows as well a sharp drop in the percentage of African-Americans and Hispanics in the progression from pre-doctoral to post-doctoral training. Even after academic appointment, minority faculty progress less rapidly and successfully to tenured status than do their non-minority colleagues (Fang et al, 2000; Chronicle of Higher Education Almanac, 2009; Nelson and Brammer, 2010; Liu and Alexander, 2010).

An in-depth examination in 2009 of the role of race and ethnicity in hiring and subsequent career development at Massachusetts Institute of Technology (MIT) highlights many of the difficulties that URM faculty face at a major research university (MIT Report on the Initiative for Faculty Race and Diversity, 2010). As in many top-tier universities, the number of URM faculty hires at MIT is far below their representation in the general population and in the population of Ph.D. awardees. Moreover, the number of URM faculty who leave MIT within the first 3-5 years after appointment is significantly higher than that of non-minority faculty, suggesting that programs supporting the early career development of pre-tenured faculty may be important for increasing the probability of ultimate success.

Thus, the extant data demonstrate a continuing need for programs that foster minority career success at each stage in the development of an academic research career.

1. *There is a continuing need for programs focused on increasing diversity at multiple stages of career development for neuroscience researchers.*

Multiple pathways and venues for minority scientific development

The Sub-Committee recognized that there are multiple pathways by which URM individuals may become neuroscience researchers or enter careers that support the biomedical enterprise in industry and education. After college, for example, they may earn graduate degrees in a variety of academic disciplines (biological sciences, social sciences, physical sciences or engineering) or professional degrees in medicine or related fields. The venues for training are also varied and can include small colleges, research-intensive universities or professional schools. Among these, minority-serving institutions (MSIs) play a special role as gateways for talented URM students.

As a result of history, language and social constraints, many in our country grow up in relatively homogeneous racial or ethnic communities with distinctive cultures, where they are both isolated and protected from the larger society. These communities extend into institutions of higher education that have largely URM populations. Because of past discrimination, particularly in the South, the African-American community has developed an extensive system of colleges, universities, graduate and professional schools that serve a predominately minority population. In the Hispanic or American Indian communities, public universities and graduate schools near relevant population centers serve a similar function.

Many academically talented students who grow up within such homogeneous communities have the confidence and/or opportunity to make the transition into a majority institution at the time of college or graduate school. For others, however, a move at this early stage may be intimidating and daunting or they may lack the opportunity to make such a move. For these students, MSIs serve an important role in facilitating transition into the larger, global community of science. Ideally, students in such institutions benefit from a community that is culturally nurturing, but that participates fully and successfully in the larger world of science.

URM students who enter majority, research-intensive institutions as pre-doctoral or post-doctoral trainees benefit from the rich intellectual environment and extensive research infrastructure that these larger institutions offer. URM students who choose this route, however, often face special challenges that need to be recognized and addressed. Committed mentorship, discussed below, is often a crucial factor in the success of these students and trainees.

- 2. The Sub-Committee suggests that an effective program to increase diversity among neuroscience researchers must address the needs of individuals in both majority and MSI institutional settings. Programs for institutional strengthening are particularly needed in the latter venue. Both URM individual and MSI institutional support are important.*

Mentorship

A recurrent theme in Sub-Committee discussions was the critical importance of mentorship in developing URM research careers. At every step along the career pathway, URM scientists report the importance of strong, consistent and encouraging mentorship (see, for example, Juarez, 1991). This theme also emerges in the MIT report as a critical factor in the success of URM faculty. Accordingly, the MIT report calls for more emphasis on mentoring junior faculty and addresses specific ways in which mentoring can be made more effective (MIT report, 2010, pp. 98-100).

- 3. Programs for active, dedicated mentorship of URM students are needed at every level for both individuals and institutions. Programs for both individuals and institutions must include, and be accountable for, a plan for mentorship of their trainees and faculty.*

Diverse careers contribute to the NINDS mission

Reducing the burden of neurological disease requires individuals who conduct basic and clinical research, who work in industry to develop and deliver new therapeutic measures, who work in education at all levels, and who work in governmental and public outreach positions. Talented individuals in all of these positions are needed to both accelerate the pace of understanding neurological disease and to ensure that research findings yield the largest possible public health benefit. The training mission of the NINDS must therefore include preparing individuals of diverse backgrounds to enter the variety of career paths needed for the discovery, dissemination, and translation of research to the clinic, as well as preparing individuals to educate society at large about best practices in the identification and treatment of neurological disease.

- 4. The recognition that important contributions to neuroscience research are made by those in a variety of research-related careers and in a variety of settings should inform both our expectations and our evaluations of outcome metrics for programs designed to increase diversity.*

FINDINGS AND RECOMMENDATIONS FOR NINDS DIVERSITY PROGRAMS

EXTRAMURAL PROGRAMS DIRECTED TO INDIVIDUALS

CURRENT PROGRAMS

Kirschstein NRSA Pre-doctoral Fellowship Awards to Promote Diversity in Health-Related Research (F31)

NIH Pre-doctoral Fellowship Awards (now called Kirschstein Pre-doctoral Fellowship Awards) to Promote Diversity were instituted by NIH in 1970 as an adjunct to the F31 Pre-doctoral Fellowship Program. Recipients, who include underrepresented racial and ethnic groups, individuals with disabilities and individuals from disadvantaged backgrounds, receive up to five years research training leading to a Ph.D. or equivalent degree. Most ICs at NIH participate in this program. Applications are reviewed by a special emphasis panel at the Center for Scientific Review.

NINDS joined the F31 Diversity Program in 1995 and the general F31 program in 2001. Over the period of 2000-2009, NINDS made 89 awards through the Diversity F31 Program. For the last several years 10-15 diversity fellowships per year have been awarded, constituting roughly 10-15% of the total pre-doctoral fellowship awards. The percentile scores and the percent of total applications awarded in the Diversity F31 Program are comparable to those in the overall program. The annual cost of the program in recent years has been \$0.5-1.0 M. Because of the lag between pre-doctoral training and appointment to a professional position, the small numbers of awardees to date, and the short lifetime of the program, the outcome data are scant. Analysis of the very earliest cohort from 1999-2001, the only data available, shows that about 17% of the awardees have submitted an application for a subsequent grant, compared with 48% of the general awardees. The Sub-Committee strongly believes that these awards are important and that they should be continued at the present level.

Research Supplements to Promote Diversity in Health-Related Research

These awards provide administrative supplements for up to two years to existing NINDS grants to support individuals from underrepresented backgrounds. The program supports individuals from high school to faculty level. NINDS currently makes about 40-50 awards per year, about half of which are new awards and half continuing awards, mostly to pre-doctoral and post-doctoral trainees. About 75% of applications are funded. The current cost of the program is \$2-3 M per year. The Sub-Committee recognizes this to be a valuable program, but is concerned about inadequate provision and accountability for mentorship and the absence of tracking data

that would permit assessment of the program's success. We urge that commitment to a specific program of mentoring and professional development, appropriate to the level of the individual, be an essential component of these awards to insure that awardees will have an experience that will help prepare them for the next stage in their careers. Applications should include a description of the mentorship that is planned and final reports evaluating the results of each award should be received from the trainee as well as the mentor.

Career Development Award to Promote Diversity in Neuroscience Research (K01)

Diversity K01 Awards are an NINDS program to promote diversity among beginning faculty-level neuroscience investigators. These are five-year "transition" awards, intended to support individuals from underrepresented groups who are making the transition from post-doctoral to junior faculty positions. The awards have a clear mandate for mentoring and career development. Since its initiation in 2003, the NINDS Diversity K01 program has made 23 awards (2-5 per year through 2009). Most of the awardees (20) have been African-American or Hispanic; three have disabilities; and one was a Pacific Islander. Eight trainees have finished the program; seven of the eight have taken research positions, six in academia and one in industry. Although long-term evaluation is not yet possible, a number of the awardees have received other NIH funding during or immediately after the award period. For reasons that are not clear, the awardees have been mostly in clinical departments. We noted that few of the awardees had tenure-track or equivalent positions, suggesting a lack of institutional commitment to the individual. The Sub-Committee strongly recommends continuation of this important program, but suggests that it be expanded to include a broader range of scientific activity, with close examination of the institutional commitment to ensure optimal career development.

Collaborative Neurological Science (CNS) Awards (S11)

This program, initiated in 1995, is meant to encourage joint research between junior faculty at MSIs and senior scientists from majority institutions who have NIH or equivalent support. Over the fifteen year history of the program, 12 collaborative projects have been funded. The results have been mixed. Based on publication records and subsequent success in grant awards, the early awardees (pre-2000), with one exception, have been less successful than more recent ones, partly because of the relative weakness of the awardees and partly because of the lack of institutional support. Even so, of the nine awardees who have completed the program, two have NIH support and two others have attracted major support from private sources. One current awardee has an application under consideration at NIMH. All of the recent awardees have multiple publications, many in high quality journals (PNAS, J. Physiol., J. Neurovirol.) and are working with excellent collaborators. All recipients from the MSIs have progressed to tenured positions. The Sub-Committee felt that in spite of its early difficulties, the CNS program

can play an important and valuable role in the early career development of investigators at MSIs and should be continued. We urge continued attention to the quality of the candidates for this award, the commitment of their collaborators and to their institution's ability to support their research.

Recommendations:

- 1. Continue the Diversity F31 Awards, the Administrative Supplements and the CNS Awards at their present levels. The Administrative Supplement Awards should be linked explicitly to provisions for strong mentorship and enrichment in addition to the opportunity for laboratory experience.*
- 2. Increase the number of K01 awards and give them a broader scientific scope. We also suggest an increased emphasis on institutional support for prospective awardees.*
- 3. We recommend that NINDS invest resources to track the career paths of prior awardees in these programs, and develop and implement immediately an effective plan for monitoring and tracking all future awardees.*

NEW NINDS PROGRAM FOR INDIVIDUALS

The Sub-Committee noted a sharp difference between the racial and ethnic proportions for NIH-wide pre-doctoral and post-doctoral fellowships for African-American and Hispanic trainees. From the period FY 2000 - FY 2008, NIH-wide, 15% of the F31 (pre-doctoral) awardees are African-American and 17% Hispanic, whereas only 1.3% and 3.2% of the F32 (post-doctoral) awardees are African-American and Hispanic, respectively. These figures suggest that support for URM training falls off at the critical transition from graduate student to post-doctoral fellow. Thus we strongly urge NINDS to consider establishing an F32 Diversity Program for post-doctoral fellows. The program could easily be modeled on the Kirschstein F31 Diversity Awards, with provision for strong and accountable mentoring as an integral part of the program. Such a program would not only aid URM post-doctoral candidates directly, but the possibility of funding would increase their attractiveness to post-doctoral advisors and thus increase post-doctoral opportunities.

Recommendation:

- 4. Establish an F32 Diversity Program for Post-Doctoral Fellows.*

EXTRAMURAL PROGRAMS DIRECTED TO INSTITUTIONS

CURRENT NINDS INSTITUTIONAL PROGRAMS

Post-doctoral Training Program for Institutions (T32)

The T32 award program is a major mechanism for training of pre-doctoral candidates during the first two years of graduate school and is the principal NINDS instrument for supporting post-doctoral training. The T32 program is not specifically targeted for diversity, but the requirements that funded programs implement effective strategies to recruit diverse trainees influence diversity efforts in neuroscience at the post-doctoral level at majority institutions. In spite of these efforts, an Institute of Medicine report found that URMs occupy a diminishing percentage of an increasing pool of T32 training positions. As the total number of training positions on T32 grants in the US increased from just above 14,000 in FY 2001 to approximately 15,000 in FY 2003, the percentage of URMs declined from 16.7% in FY 2001 to 15.8% in FY 2003.

NINDS currently requires T32 applicants to demonstrate a commitment to recruiting URM trainees. Because the number of URM Ph.D.s is relatively small, most post-doctoral programs document their efforts, but ultimately take the position that, despite these efforts, they are unable to find suitable candidates. The Sub-Committee strongly believes that this is no longer an adequate response. There are now a number of well-established examples of outstanding programs that are successful in attracting qualified minority trainees. We thus believe it is possible for institutions with will and commitment to find and attract qualified minority fellows. We strongly recommend that NINDS require both a demonstrated record of success in diversity for the institution's training programs and a successful program of mentorship as a necessary precondition for receiving an award. The institution's success in recruiting both pre-doctoral and post-doctoral URM trainees will be taken as evidence of its commitment to the diversity goals of the program.

Recommendation:

- 1. Require that NINDS T32 awardees have a demonstrated record of success in diversity and that structured mentorship be an integral part of the training program.*

Neuroscience Scholars Program (R25)

The Neuroscience Scholars Program (NSP) is a three-year fellowship administered by the Society for Neuroscience (SfN) for diverse undergraduate, graduate, and post-doctoral students in neuroscience. The NSP provides SfN annual meeting travel assistance, funds for enrichment opportunities, SfN meeting and membership benefits, and mentoring. The NSP began in 1981

and is funded by an R25 from NINDS (Erich Jarvis, P.I.). This year, the program attracted a record number of applicants (102), a 50% increase over any previous year. The program has supported over 500 trainees, and a number of graduates are now in academic positions throughout the country. SfN is currently tracking former awardees and will be able to provide better assessment measures in the coming year. The Sub-Committee strongly supports continuation of this award.

Specialized Neuroscience Research Program (SNRP) (U54)

Background

The SNRP initiative began in 1998 as a collaboration among NINDS, the National Center for Research Resources (NCRR) and the National Center on Minority Health and Health Disparities (NCMHD). The SNRP's purpose is to strengthen neuroscience research at medical and graduate institutions serving underrepresented cultural or racial minorities. The awards have been made under a cooperative agreement mechanism, with continuous monitoring by NINDS which assumes administrative responsibility for the program. The original intent was to help develop centers of excellence in neuroscience research at MSIs. Critical to the original aim was to help young investigators develop strong, independent, competitive research programs that would lead to R01 success. There are currently SNRPs at 12 MSIs. The URM populations served by these institutions include African-American, Hispanic, Native American and Pacific Islander populations.

As the SNRP initiative developed, a two-phase system of five-year cycles was introduced, in which the first phase focused on strengthening critical research infrastructure, fostering collaborations, supporting young investigators prior to R01 application and developing training. The second phase emphasized scientific and programmatic performance leading to competitively funded awards, often with a programmatic emphasis. Each SNRP has a Scientific Advisory Committee (SAC) and a Program Advisory Committee (PAC) which, along with personnel from the NINDS Office of Minority Health and Research (OMHR), oversee the program. Progress in each program is tracked through a mutually-agreed upon timeline with specific objectives.

Evaluation and recommendations for changes

The Sub-Committee is quite familiar with the SNRP programs as most of our members have been associated with one or more SNRP programs as trainees, faculty, or as PAC or SAC members. The Sub-Committee is supportive of the SNRP program and believes that it has been extremely valuable and effective overall. One of our members described their participation in the SNRP program as "career-changing".

Nevertheless, the Sub-Committee has a number of serious concerns about the program and proposes a series of recommendations that we believe are essential to its continuing success. First, based on several criteria (publication record, grant success, composition of the SAC and PAC), there appears to be a wide range in quality of the individual SNRPs. SNRP programs with strong and effective leaders and committed institutional support have achieved excellent faculty and trainee publication records, and have fostered the development of young investigators who go on to R01-funded careers. These SNRPs have often nucleated broad neuroscience programs that can recruit excellent young faculty in competition with research-intensive institutions. In some cases, the research centers arising from SNRP programs have also become centers of graduate and undergraduate training for minorities. Other programs have been less successful, through lack of effective leadership, institutional support, or weak advisory committees. We recommend that the overall quality of the SNRP program be strengthened by decreasing the number of awards and focusing on those institutions that are the most successful. One of our members remarked that this was an entirely natural process: after a period of synaptic growth during early development of the program, it is now time for some synaptic pruning.

A second concern is that the NINDS SNRP program has been burdened with too many missions. In particular, the assignment of responsibility for health disparities to the Office of Minority Health and Research has sometimes resulted in pressure on SNRPs to focus inappropriately on issues related to minority health. In some instances, this has worked at cross-purposes to the original intent to build centers of research excellence without regard for particular programmatic emphasis. Although MSIs may often choose to give institutional priority to health disparities, an expectation by NINDS that research at these institutions should be focused on health disparities is not appropriate and can be counter-productive to ultimate success.

A third concern is that the structure and policies that NINDS has imposed on the institutions have not always supported the original goals of the program. For example, SNRP faculty who obtain an R01 should NOT be required to relinquish their SNRP position unless there is scientific overlap. SNRP faculty also should be expected to present posters, give presentations, or otherwise engage with their peers at national or international scientific meetings. Although the national SNRP meetings are valuable, they do not substitute for a major national or international meeting. The ultimate intent of the program must be to facilitate the entry and full participation of young faculty at MSIs into the larger world of contemporary neuroscience.

We thus suggest that NINDS reformulate and refocus its commitment to its original purpose of the SNRP initiative: to develop centers of research excellence in neuroscience at MSIs. All other goals should be subsidiary to this one.

Finally, we suggest that the desired developmental pathway for the SNRP programs be expanded and reconfigured to reward success at each stage. The ultimate aim should be a strong research center with multiple R01s and other competitive grants. In the initial phase, institutions need to establish effective leadership, recruit strong SACs and PACs, build infrastructure and support pilot projects. The second phase should emphasize competitive grant funding for individual projects and investigators. Success at this stage, however, should not signal the end of SNRP support, as this is one of the most vulnerable points along the road to building a strong center.

First, if an individual, particularly a minority individual, is successful in getting an R01 they immediately become a target of recruitment from other institutions. Second, as grant dollars awarded to an institution increase, the need for administrative and other research infrastructure also increases. MSIs are rarely research-intensive, and often are not well-equipped to handle the increased research administration load. We thus suggest that a third stage of SNRP support be added to provide funds that can be used for administrative support, new pilot projects, one-time faculty recruitment costs, seminars, graduate student recruitment and other needs for which dollars are short, especially at MSIs. At this relatively mature stage of development, we recommend that the program director, after appropriate consultation with the PAC, be given wider discretion in the allocation and use of funds. Award and continuation of these funds should be contingent upon continuing R01 or other research awards. With continued growth, a SNRP program should ultimately be able to win a P30 or other award for support of infrastructure, though it is understood that this outcome may take 10-15 years to achieve.

In addition, the Sub-Committee recommends that successful SNRPs be offered the opportunity to apply for an optional component in Phase II and/or Phase III applications that would support teaching programs for undergraduate, graduate and/or post-doctoral training as determined by institutional needs and opportunities. A strong center of neuroscience research in an MSI offers an unusual opportunity to recruit young minority students to the field of neuroscience through classroom teaching and laboratory experience. Support for such programs could be an effective and strategic way of amplifying the impact of the SNRP programs on diversity in neuroscience research.

Recommendations:

2. *Decrease the number of SNRP awards so that NINDS investment can focus on the most successful programs.*
3. *Refocus the SNRP initiative on the original goal of the program: to develop centers of research excellence in basic and/or clinical neuroscience at MSIs.*

4. *Redefine the policies, anticipated pathway and expected milestones of the SNRP program to accommodate different stages of growth and to reward success.*
5. *Require strong leadership and a strong SAC as prerequisites for a SNRP award.*
6. *Allow SNRP programs that are sufficiently mature to add a teaching or educational component to their activities to attract minority students to neuroscience research.*

NEW NINDS PROGRAM FOR INSTITUTIONS

Although the support of diversity in basic science is well developed at NINDS, the support of diversity in clinical research, equally important, has received less attention. We propose that NINDS consider funding institutional training programs whose purpose is to train early career clinical investigators in health disparities-related neuroscience research. The training could be at any qualified institution, including, but not limited to, MSIs. The program could be carried out in collaboration with NCRR through the Clinical Research Education and Career Development (CRECD) Program or with other NIH institutes focused on research in brain and behavior, as appropriate.

Recommendation:

7. *Consider establishing an initiative to support training programs for early career clinical investigators in health disparities-related neuroscience research at qualified institutions, including, but not limited to, MSIs.*

DIVERSITY IN THE NINDS INTRAMURAL PROGRAM

Although not explicitly in our original charge, the Sub-Committee decided to include the NINDS Intramural Program in its report. With 48 faculty-level investigators and 270 pre- and post-doctoral trainees, the NINDS represents one of the major research and training centers for neurological sciences in the country, and its policies and programs may be expected to exert considerable influence in minority career development. The diversity record of the NINDS Intramural Program is remarkably bifurcated. On one hand the Summer Internship Program (SIP) has been one of the most successful programs at NIH in promoting diversity in the scientific workforce (Garnett, 1993). Apart from the SIP, however, there seems to be little evidence of an institutional commitment by the NINDS Intramural Program to promoting diversity. Although there are scattered individual efforts, there is no organized program at NINDS to encourage and support recruitment of URM individuals as faculty or as pre- or post-doctoral trainees into the Intramural Program nor is there provision for mentorship of those who are admitted into the program.

NINDS Summer Internship Program in the Neurological Sciences

The SIP originated in the early 1980s as a program to recruit outstanding students at the high school, college and graduate or professional level into the neurosciences by providing summer research opportunities in NINDS laboratories. Under the dedicated and effective leadership of Levon Parker and Drs. Dale MacFarlin and Joseph Gibbs, the program from the outset had a strong emphasis on quality and on diversity outreach. Outstanding students were recruited at both majority and minority institutions through visits, by cultivating faculty who referred their best students, and through workshops at the Society for Neuroscience meetings. As a result, the program has always had a significant component of African-American, Hispanic, disabled and, more recently, Native American students. For example, the current class (summer, 2010) of 70 students has 8 African-Americans, 4 Native Americans 4 Pacific Islanders and 3 Hispanic students. In the 1990s the NINDS SIP became the model for other NIH training programs under the Office of Education (now known as the Office of Intramural Training and Education). As Director of Intramural Research, Dr. Story Landis instituted a required program of mentorship in which each student has a preceptor.

Over the years, the SIP has provided a quality research experience for an estimated 2 - 3,000 students, with many returning for a second or third summer. Many of the SIP trainees have gone on to highly successful academic and/or biomedical careers in neuroscience (see, for example, http://www.ninds.nih.gov/jobs_and_training/summer/where.htm). One flaw in this otherwise outstanding program has been the failure to keep systematic records and follow-up data that would allow systematic assessment of effectiveness. The program has fostered a large number of success stories, however, in which minority individuals give strong credit to the importance of the program in influencing their careers (see above). The Sub-Committee strongly supports continuation of the SIP and urges that particular attention be paid to tracking career outcomes of participants. We also urge that in addition to dedicated staff, the SIP have specified NINDS faculty leadership.

NINDS Faculty and Pre- and Post-doctoral Trainees

The representation of URMs (and of women) among the senior and tenure-track investigators at NINDS lags that of NIH overall. Thus, among 49 senior and tenure-track investigators, there are two Hispanic individuals (4%) and no African-Americans or Native Americans. Notably among 11 NINDS tenure-track investigators there are no URMs. Comparable tenure-track figures for all of NIH are approximately 1% African-American and 3% Hispanic. (The figures for women are particularly striking. Only 12% of investigators at NINDS are women, compared to 22% at NIH overall; for tenure-track investigators, the figures are 18% and 33%, respectively). In particular, the relative lack of racial, ethnic and gender diversity among NINDS tenure-track

investigators is discouraging, as it means that little change in the overall make-up of NINDS intramural investigators will occur in the near future.

With respect to trainees, 5 of 33 graduate students (15%) and 16 of 237 IRTAs and post-doctoral fellows (7%) are URM individuals. Comparable figures for NIH are unavailable. Curiously, although NIH requires institutional applicants for T32 grants to provide data on the racial and ethnic background of its post-doctoral applicants and fellows, NINDS does not keep such records. (The data given above were developed specifically in response to the request of the Sub-Committee). One of our members remarked that on the basis of its diversity program, the NINDS Intramural Program would not qualify for a T32 award.

The Sub-Committee believes that a more explicit and coordinated commitment by the NINDS Intramural Program to minority training and career development could have major impact. Specifically, we recommend that one or more current NINDS faculty be given responsibility for developing an active recruitment and mentoring program for URMs. Coordination with SIP, with other ICs and with the diversity efforts in the Extramural Program would enhance these activities.

Recommendations:

- 1. Continue the highly effective Summer Internship Program. An NINDS faculty member should be added to the leadership of the program and the subsequent careers of trainees should be tracked for purposes of program evaluation.*
- 2. The NINDS Intramural Program should make minority research training and career development a clear priority and should develop an Institute-wide program, under the direction of NINDS faculty, to recruit and mentor minority trainees at the pre-doctoral, post-baccalaureate, post-doctoral and investigator levels.*
- 3. Establish an Institute-wide database as part of the diversity program development that would track SIP students, intramural trainees and faculty and provide the basis for program assessment.*
- 4. Wherever possible, coordinate these programs with extramural diversity efforts.*

INTERNAL ADMINISTRATION OF NINDS DIVERSITY PROGRAMS

NINDS programs in diversity and health disparities are overseen and coordinated by the Office of Minority Health and Research (OMHR), under the leadership of Dr. Al Gordon, Associate Director. The OMHR has four scientific staff and includes both M.D. and Ph.D. members. The Office was originally established in 1999 as the Office of Special Programs in Neuroscience, with responsibility for the SNRP initiative and other diversity programs. In 2001, the Office was also

given responsibility for NINDS health disparities research and, at that time, given its present name. The Office has direct responsibility for the SNRP initiative, the Stroke Prevention and Intervention Research Program (SPIRP), the Diversity K01 awards, the R25 awards and CNS awards. OMHR also works with NINDS extramural program staff in management of the Administrative Supplements and represents NINDS in NIH-wide programs such as the Diversity F31 awards.

In the view of the Sub-Committee, combining health disparities and diversity efforts in one office has not been an optimal arrangement, either for diversity or health disparities. Although minority investigators can play critically important roles in health disparities research and may have special motivation to do so, health disparities is not a problem for minority communities alone, but has direct and indirect consequences for all in our society. Successful health disparities research thus requires the participation of a broad array of scientific and clinical specialists from institutions across the country. The Sub-Committee on Health Disparities will make specific recommendations about NINDS organizational structures that can best support research in this area. Whatever the final solution, we suggest that health disparities research at NINDS will need to be closely coordinated with other NINDS efforts with respect to the relevant disease. Diseases for which there is evidence-based documentation of disparities in susceptibilities or outcomes for minority or underserved populations (e.g. stroke, epilepsy, and others) clearly have elements in common, but also present biological, clinical and social challenges that need to be understood and addressed in the context of the particular disease as well as in the context of health disparities.

Likewise, although recruiting a more diverse workforce for neuroscience research may ultimately be expected to benefit health disparities, the importance of a diverse workforce extends much more broadly. Diversity is important for optimal success in all aspects of neuroscience research, not just that directed to health disparities. For these reasons, we believe that the current arrangement of responsibilities at NINDS does not serve the institute well. Specifically, assigning responsibility for health disparities to the office overseeing the SNRPs and other diversity programs has introduced a distracting and confusing element into the programs that has often been inimical to their long-term goals. We thus recommend that health disparities and diversity efforts be formally separated, with suitable mechanisms for close relations between them. We leave it to our sister Sub-Committee to suggest specific alternatives for the administration of health disparities research. We, however, suggest the following possible alternatives for the NINDS diversity programs:

1. OMHR could be reorganized and refocused on training, career development and institutional programs whose purpose is to foster increased diversity in all parts of the neuroscience workforce.

2. Responsibility for diversity programs targeted to individuals (F31 and possibly F32), along with K01 and administrative supplements, might be folded into the training office, to become one arm of the broad effort to support neuroscience training. Responsibility for the SNRP program could become a separate arm of that office.
3. A new diversity office could be organized that would report directly to the Director of Extramural Research. The Director of Extramural Research would be responsible for integrating the activities of the office with other extramural activities and programs.

However the organization is carried out, we believe it is of highest importance to the ultimate success of diversity efforts that they be integrated as much as possible with other NINDS programs. Thus staff members that are responsible for diversity programs should be in frequent contact with, and work closely with, the relevant NINDS scientific program and review officers. The ultimate aim, both for individuals and for institutions, is that they should become full participants in the national and international research communities. NINDS should also establish an ongoing external advisory group whose charge is to review and evaluate NINDS diversity programs, with the goal of establishing best practices based on defined outcomes.

Recommendations:

1. *Formally separate administrative responsibility for NINDS diversity programs from responsibility for health disparities.*
2. *Reorganize and refocus the diversity programs for training, career development and enhancing institutional infrastructure.*
3. *Whatever administrative structure is adopted, we urge that diversity staff work closely with relevant scientific officers and with Institute review staff.*
4. *Consider the establishment of an external advisory group that would include NINDS Council members and meet periodically to evaluate and review NINDS diversity programs.*

COOPERATION WITH OTHER NIH INSTITUTES AND CENTERS (ICs)

We strongly urge NINDS cooperation in diversity programs with other relevant ICs. The original SNRP initiative represented collaboration among NINDS, NCMHD and NCRR, so there is a history at NIH of collaborative interactions on behalf of diversity. As the current NCMHD is to shortly become an institute, presumably with expanded programs, there will be even more opportunities for interaction. The Sub-Committee is particularly interested in the possibility of collaboration with the CRECD Program of NCRR in a program to train clinical investigators. The collaboration of brain-related institutes on an R25 trans-neuroscience initiative through the NIH Blueprint for Neuroscience Research is encouraging. A similar collaboration with the

National Institute for General Medical Sciences (NIGMS) to support pre-doctoral training opportunities at MSIs should be explored. MSIs are often too small to have a separate neuroscience program, making collaborative, broadly based support for pre-doctoral training in the biomedical sciences particularly attractive.

One problem related to effective collaboration between ICs is the lack of information about the multiplicity of programs that support diversity efforts. To prevent duplicative and even competitive funding efforts on behalf of minority career development and to identify funding gaps, an asset analysis of investments in minority career development at the individual and institutional levels should be performed by the Office of the Director of NIH, perhaps spearheaded or piloted by NINDS. One outcome of the effort should be a central website describing the available programs for minority career development NIH-wide.

Recommendations:

- 1. We strongly recommend that NINDS encourage and support collaboration with other NIH ICs in their diversity programs.*
- 2. Perform an investment/asset analysis to organize information across NIH about programs that foster diversity in the biomedical workforce, to serve as the basis for further strategic planning and multiple IC investment. Establish a single NIH website available to individuals and institutions that is devoted to NIH programs to foster minority investigator career development.*

EVALUATION AND ACCOUNTABILITY

Our Sub-Committee lacked access to suitable information, particularly longitudinal outcomes, for rigorous evaluation of the success of the various NINDS programs intended to enhance diversity in the biomedical workforce. In addition, we were concerned about the limited metric for success, i.e. R01 funding. We thus recommend that NINDS hire technical and evaluation experts to develop an IT platform and tracking mechanism for a comprehensive database and to use the system to continuously evaluate success of the programs. Periodic review by Institute leadership could serve to inform decisions on program expansion or discontinuation based on their documented success.

Recommendation:

- 1. Establish a relevant set of metrics for success of minority training and career development programs. Use these metrics to develop a comprehensive database and*

tracking system for all individuals in NINDS diversity programs, along with a reference group.

2. *Designate or recruit program evaluation experts to facilitate on-going assessment of minority training and career development programs with periodic reporting to Institute leadership.*

REFERENCES

- "Almanac of Higher Education" (2009). The Chronicle of Higher Education.
(see <http://chronicle.com/section/Almanac-of-Higher-Education/141>)
- "Assessment of NIH Minority Research and Training Programs: Phase 3." (2005). National Research Council (US) Committee for the Assessment of NIH Minority Research Training Programs. The National Academies Press.
- Committee on Neuroscience Departments and Programs (2009). Society for Neuroscience. (before consolidating with SfN this committee was known as the Association for Neuroscience Departments and Programs; see <http://www.andp.org/>)
- Fang, D., Moy, E., Colburn, L., and J. Hurley (2000). "Racial and Ethnic Disparities in Faculty Promotion in Academic Medicine." *JAMA* **284**: 1085-1092.
- Garnett, Shannon (1993). "Future Scientists Spend Summer at NINDS." *NIH Record* **XLV** (19): 1-2.
- Ginther, D. K., Schaffer, W., Schnell, J., Masimore, B., Liu, F., Haak, L. and R. Kington (2009). "Diversity in Academic Biomedicine: An Evaluation of Education and Career Outcomes with Implications for Policy." Mimeo, University of Kansas.
(see http://odoermoss.nih.gov/inport/wip/investigators_and_trainees/)
- Juarez, C. E. (1991). "Recruiting Minority Students for Academic Careers: The Role of Graduate Student and Faculty Mentors." *PS: Political Science and Politics* **24**(3): 539-540.
(see http://report.nih.gov/investigators_and_trainees/index.aspx)
- Liu, C.Q. and A. Hershel (2010). "Promotion Rates for First-time Assistant and Associate Professors Appointed from 1967 to 1997." Association of American Medical Colleges, *Analysis in Brief* **9** (7).
- "Missing Persons: Minorities in Health Professions. A Report of the Sullivan Commission on Diversity in the Healthcare Workforce." (2004). The Sullivan Commission.
(see <http://www.aacn.nche.edu/Media/pdf/SullivanReport.pdf>)
- Nelson, D.J. and C.N. Brammer (2010). "A National Analysis of Minorities in Science and Engineering Faculties at Research Universities." 2nd Edition.
(see http://chem.ou.edu/~djn/diversity/Faculty_Tables_FY07/07Report.pdf)
- "Participation in Selected NIH Programs by Race and Ethnicity, Fiscal Years 2000-2008." (2009). Internal Analysis Report, National Institutes of Health Office of Extramural Research.
- "Report on the Initiative for Faculty Race and Diversity." (2010). Massachusetts Institute of Technology.
(see <http://web.mit.edu/provost/raceinitiative/report.pdf>)
- Shavers, V.L., Fagan, P., Lawrence, D., McCaskill-Stevens, W., McDonald, P., Browne, D., McLinden, D. Christian, M. and E. Trimble (2005). "Barriers to Racial/Ethnic Minority Application and Competition for NIH Funding." *J. National. Med. Assoc.* **97**: 1063-1077.
- "Survey of Earned Doctorates." (2008). National Science Foundation.
(see <http://www.norc.org/projects/survey+of+earned+doctorates.htm>)
- U.S. Census Bureau, Population Division (2007). "Annual Estimates of the Population by Sex, Race, and Hispanic or Latino Origin for the United States: April 1, 2000 to July 1, 2007."
(see www.census.gov/popest/national/asrh/NC-EST2007-asrh.html)
- U.S. Census Bureau, Population Division (2008). "National Population Projections."
(see www.census.gov/population/www/projections/)

APPENDIX A



NINDS Awardees by Race and Ethnicity Fiscal Years 1999 – 2009



Source: Data drawn from frozen Link.dsai2_Pub9809_vwFile and OLTP database as of (8/12/2010).

Notes: In the following table:

- (1) Grants funded under the American Recovery and Reinvestment (ARRA) Act of 2009 are excluded.
- (2) Counts for awardees not reporting ethnicity information is not shown separately.
- (3) Note that an awardee can indicate more than one race, and data are subject to changes.
- (4) * 'All race reporting' shows the number of awardees who have reported their race information.
- (5) For each race category, White, Asian, African Americans, Pacific Islander, and American Indian, number of awardees of a race category as a percentage of all awardees who have reported their race information is presented. 'All race reporting', 'Hispanic ethnicity' and 'Unknown race' are presented as awardee counts.
- (6) 'Unknown race' includes awardees whose race information is missing or withheld.
- (7) R01 equivalents includes activity codes R01, R23, R29, and R37.
- (8) Research Project Grants include activity codes: R00, R01, R03, R15, R21, R22, R23, R29, R33, R34, R35, R36, R37, R55, R56, RL1, RL2, RL5, RL9, P01, P42, PN1, U01, U19, U34, DP1, DP2, DP3, RC1, RC2, RC3, UC1, UC2, UC3, UC7, UH2.

Fiscal Year	Race/ Ethnicity	F30 & F31 Awardees	F32 & F33 Awardees	T32 Pre-Doctoral Awardees	T32 Post-Doctoral Awardees	R01 Equivalents Awardees	Research Projects Grant Awardees
1999	White (%)	72.7%	75.0%	81.6%	82.4%	88.3%	88.7%
1999	Asian (%)	9.1%	23.3%	15.3%	14.7%	11.3%	10.9%
1999	African American (%)	9.1%	1.7%	3.1%	2.9%	0.3%	0.3%
1999	Pacific Islander (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1999	American Indian (%)	9.1%	0.0%	0.0%	0.0%	0.1%	0.1%
1999	All Race Reporting *	11	176	98	136	1,752	1,845
1999	Unknown Race	3	19	15	27	96	98
1999	Hispanic Ethnicity	12	3	2	5	11	12
2000	White (%)	55.0%	74.6%	84.1%	79.9%	88.1%	88.6%
2000	Asian (%)	15.0%	22.3%	12.5%	17.4%	11.6%	11.1%
2000	African American (%)	25.0%	1.0%	2.3%	2.1%	0.3%	0.3%
2000	Pacific Islander (%)	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%
2000	American Indian (%)	5.0%	1.0%	1.1%	0.7%	0.1%	0.1%
2000	All Race Reporting	20	193	88	144	1,842	1,955
2000	Unknown Race	2	14	16	21	101	103
2000	Hispanic Ethnicity	12	3	4	6	14	14
2001	White (%)	80.0%	77.6%	84.6%	75.9%	87.2%	87.9%

2001	Asian (%)	8.0%	17.9%	8.1%	17.3%	12.5%	11.8%
2001	African American (%)	6.0%	1.9%	4.9%	5.6%	0.3%	0.2%
2001	Pacific Islander (%)	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%
2001	American Indian (%)	6.0%	1.3%	2.4%	1.2%	0.1%	0.0%
2001	All Race Reporting	50	156	123	162	1,918	2,077
2001	Unknown Race	7	15	15	25	105	116
2001	Hispanic Ethnicity	10	1	4	4	11	11
2002	White (%)	87.2%	81.7%	83.3%	71.3%	87.0%	87.6%
2002	Asian (%)	7.3%	16.2%	6.3%	20.2%	12.5%	11.9%
2002	African American (%)	4.6%	0.7%	9.0%	7.9%	0.3%	0.4%
2002	Pacific Islander (%)	0.0%	0.7%	0.0%	0.0%	0.1%	0.0%
2002	American Indian (%)	0.9%	0.7%	1.4%	0.6%	0.1%	0.1%
2002	All Race Reporting	109	142	144	178	1,969	2,204
2002	Unknown Race	12	20	9	20	106	122
2002	Hispanic Ethnicity	12	3	5	3	12	12
2003	White (%)	87.1%	79.8%	86.8%	79.7%	86.1%	86.8%
2003	Asian (%)	6.5%	20.2%	5.3%	14.4%	13.5%	12.7%
2003	African American (%)	4.3%	0.0%	7.9%	5.9%	0.4%	0.4%
2003	Pacific Islander (%)	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
2003	American Indian (%)	2.2%	0.0%	0.0%	0.0%	0.1%	0.0%
2003	All Race Reporting	139	124	152	187	1,966	2,278
2003	Unknown Race	18	17	7	19	115	134
2003	Hispanic Ethnicity	11	4	2	1	11	13
2004	White (%)	79.9%	81.0%	83.1%	79.8%	86.0%	86.6%
2004	Asian (%)	12.3%	18.2%	7.1%	13.7%	13.6%	12.9%
2004	African American (%)	5.9%	0.0%	9.1%	5.4%	0.3%	0.3%
2004	Pacific Islander (%)	0.0%	0.0%	0.6%	0.6%	0.0%	0.0%
2004	American Indian (%)	2.0%	0.8%	0.0%	0.6%	0.0%	0.0%
2004	All Race Reporting	204	121	154	168	2,012	2,351
2004	Unknown Race	21	10	3	22	119	143
2004	Hispanic Ethnicity	8	2	6	1	9	11
2005	White (%)	77.7%	80.5%	82.5%	78.0%	84.6%	85.0%
2005	Asian (%)	15.2%	17.9%	8.4%	18.7%	14.8%	14.5%
2005	African American (%)	4.9%	0.8%	8.4%	2.2%	0.4%	0.4%
2005	Pacific Islander (%)	0.4%	0.0%	0.7%	0.5%	0.1%	0.0%
2005	American Indian (%)	1.8%	0.8%	0.0%	0.5%	0.1%	0.1%
2005	All Race Reporting	224	123	143	182	1,941	2,310
2005	Unknown Race	20	2	3	13	103	123
2005	Hispanic Ethnicity	6	1	3	2	12	14
2006	White (%)	81.0%	87.6%	83.7%	76.0%	84.5%	83.9%
2006	Asian (%)	12.0%	11.6%	8.9%	17.4%	14.8%	15.3%
2006	African American (%)	5.4%	0.8%	7.4%	4.8%	0.5%	0.6%

2006	Pacific Islander (%)	0.8%	0.0%	0.0%	1.2%	0.1%	0.0%
2006	American Indian (%)	0.8%	0.0%	0.0%	0.6%	0.2%	0.1%
2006	All Race Reporting	242	121	135	167	1,955	2,373
2006	Unknown Race	30	4	3	12	96	120
2006	Hispanic Ethnicity	5	1	3	4	13	15
2007	White (%)	82.3%	83.0%	82.2%	73.9%	83.4%	82.7%
2007	Asian (%)	12.4%	15.1%	9.6%	18.2%	16.1%	16.8%
2007	African American (%)	3.6%	1.9%	8.2%	6.1%	0.4%	0.4%
2007	Pacific Islander (%)	0.8%	0.0%	0.0%	1.8%	0.1%	0.0%
2007	American Indian (%)	0.8%	0.0%	0.0%	0.0%	0.2%	0.1%
2007	All Race Reporting	249	106	146	165	1,838	2,364
2007	Unknown Race	43	7	7	6	112	157
2007	Hispanic Ethnicity	6	1	3	5	12	15
2008	White (%)	83.6%	80.7%	81.8%	76.1%	82.3%	82.2%
2008	Asian (%)	11.8%	18.2%	9.8%	15.9%	17.0%	17.2%
2008	African American (%)	4.2%	1.1%	6.8%	5.7%	0.4%	0.4%
2008	Pacific Islander (%)	0.0%	0.0%	0.8%	1.7%	0.1%	0.0%
2008	American Indian (%)	0.4%	0.0%	0.8%	0.6%	0.2%	0.1%
2008	All Race Reporting	238	88	132	176	1,696	2,240
2008	Unknown Race	68	16	14	6	114	176
2008	Hispanic Ethnicity	4	2	3	0	10	13
2009	White (%)	82.2%	84.8%	79.5%	78.8%	82.2%	81.9%
2009	Asian (%)	13.8%	13.9%	9.3%	16.9%	17.2%	17.5%
2009	African American (%)	3.6%	1.3%	9.3%	3.8%	0.4%	0.5%
2009	Pacific Islander (%)	0.0%	0.0%	1.2%	0.6%	0.0%	0.0%
2009	American Indian (%)	0.4%	0.0%	0.6%	0.0%	0.2%	0.1%
2009	All Race Reporting	247	79	161	160	1,644	2,139
2009	Unknown Race	75	21	9	8	139	195
2009	Hispanic Ethnicity	2	2	3	0	12	15