



# Human Genetics & Genomics Workforce Survey



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Prepared by the American  
Society of Human Genetics



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American College of Medical Genetics and Genomics (ACMG)

Association of Professors of Human and Medical Genetics (APHMG)

Minority Genetic Professionals Network (MGPN)

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## EXECUTIVE SUMMARY

**Building a diverse workforce is increasingly a primary concern of the genetics and genomics enterprise. Governmental agencies, academic institutions, corporations, associations, and others are keenly focused on attracting and retaining diverse talent.** The present lack of diversity in the workforce impacts scientific innovation, global competitiveness, and the ability to deliver new insights into human disease and health. Despite decades of effort to increase representation in scientific workforces, barriers such as access to educational opportunities or fair treatment in career promotion and advancement persist. To achieve greater diversity, there must be data to benchmark where the current workforce demographics stands and what interventions are necessary to foster a more inclusive environment at each stage of the genetic and genomic career pathway.

This report is the first-of-its-kind study that provides the current comprehensive baseline data describing the demographic composition of the human genetics and genomics workforce in training programs and the workplace, based on a fielded survey of individuals identified from an alliance of professional genetics and genomics membership associations. The report includes three main sections: the survey of individuals in human genetics and genomics; the survey of academic departments, programs, institutions, and organizations; as well as interviews and focus groups about workforce culture

and climate. The report lays the important groundwork for future assessment.

With funding support by the National Human Genome Research Institute (NHGRI), the American Society of Human Genetics (ASHG), in partnership with the American College of Medical Genetics and Genomics (ACMG), the National Society of Genetic Counselors (NSGC), the Association of Professors of Human and Medical Genetics (APHMG), the American Board of Medical Genetics and Genomics (ABMGG), and the Minority Genetic Professionals Network (MGPN) conducted an inaugural survey, which was fielded from February 2021 to May 2021. A total of 4,367 individuals out of 13,431 provided responses to the survey resulting in a response rate of 33%. Captured in this report are characteristics such as citizenship; race, ethnicity, or ancestry; gender identity; age; disability status; and disadvantaged background. In addition, this report provides extensive details about the respondents' education, employment, compensation, training, and career experiences.

The picture that emerges from the data is multifaceted. Analysis of the data resulted in several key findings, which provide valuable insight on workforce composition and demonstrates the importance of collecting demographic information which can help inform programmatic or policy gaps and better streamline resources for trainings and workplace setting.

## Key Findings

The majority of the respondents were U.S. citizens, identified as Women, identified as White, and were employed in a permanent position.

### Citizenship, Employment Status, and Pay Information

Overall, the majority (73.3%) of survey respondents identified as U.S. citizens. Approximately 78 percent were employed in a permanent position. Genetic counseling (45.7%), research (30.4%), and academic (23.4%) were the top three primary areas of work for employed respondents. Survey results revealed that there is a distinct gender difference in respondents' specific field of study and primary area of work within the human genetics and genomics field.

## Race, Ethnicity, & Ancestry

Consistent with STEM and biomedical fields, the genetics and genomics workforce is predominantly a homogeneous group with 67.0% of respondents identifying their race, ethnicity, or ancestry as White (n=2,224). Other self-reported races, ethnicities, or ancestries (17.5%) include Asian (7.4%; n=245); Black, African American, or African (1.5%; n=50); Hispanic, Latino, or Spanish (2.0%; n=68); Middle Eastern or North African (1.1%; n=36); American Indian or Alaska Native (<1%); Native Hawaiian or other Pacific Islander (<1%); and Multiracial (4.8%; n=160). 15.4% of survey respondents opted not to self identify.



## Gender Identity and Sexual Orientation:

Women made up the majority of survey respondents. There were 23.3% identifying as Men and 0.5% (n=18) identified as Nonbinary or Transgender. Additionally, 228 (6.9%) reported identifying as Lesbian, Gay, Bi-Sexual, Transgender, Queer, Intersex, Asexual (LGBTQIA).



## Age

Majority of survey respondents (45.1%) were between 25 and 40 years old. The mean age was 42.9 years old.

## Disability Status

From the overall sample of respondents studying, training, or employed in the U.S. (n=3,319), 3.4% (n=113) reported having a disability. 61.1% (n=69) of respondents who reported having a disability reported utilizing accessibility aids. 41.6% (n=47) reported that they requested accommodations at work or school. 7.2% were denied accommodations and 24.6% (n=17) were afraid of disclosing their disability.

## Disadvantaged Background

Using criteria outlined in the NIH Guide Notice (NOT-OD-20-031), 12.1% of respondents identified as individuals from a disadvantaged background.

The report points out the persistent challenge of diverse representation in the human genetics and genomic workforce and outlines key areas where change is needed. The findings in this report are organized to include educational background, employment, training experiences, and career advancement with a primary focus on demographic characteristics. These results serve as a baseline to inform future work.

# 1

## Introduction

For decades, the field of human genetics and genomics has driven innovation, scientific discovery, and technological breakthroughs worldwide. Successful and emerging research relies on the talent and skills of a diverse workforce. Individuals in the human genetics and genomics workforce make important contributions to the understanding of disease mechanisms and improvements in human health and clinical practice. This workforce, which includes researchers, clinicians, and counselors, is essential to shaping these frontiers and maximizing the benefits of this science. The overall goal of this report is to assess the demographic landscape of the human genetics and genomics workforce and the factors affecting diversity, equity, and inclusion in the field.

## THE CURRENT STATE OF WORKFORCE DIVERSITY

It is well-documented that the broader U.S. biomedical workforce is insufficiently diverse, lacking equitable participation of underrepresented communities based on race and ethnicity, gender, disability, and economic background. Across the biomedical enterprise, public and private institutions as well as researchers and policymakers increasingly emphasize the need for expanding the diversity of the scientific workforce. Based on several National Academies of Science, Engineering, and Medicine (NASEM) reports and proceedings, many demographic groups that are not as represented in science as they are in the general population are seen as an underutilized source of the scientific workforce. This lower representation signals a lack of inclusion in the workplace, which may negatively impact productivity and innovation (Hewlett, Marshall, and Sherbin 2013). In a recently published economic analysis, Hsieh and colleagues from the University of Chicago showed that about one-fifth of the productivity gains made in the U.S. since 1960 can be explained by reduced barriers and increased participation of women and Black men in high-skilled occupations (Hsieh, Hurst, Jones, & Klenow, 2019).

In the U.S., the biomedical science fields have historically had particularly low representation of women and members of several racial and ethnic groups (i.e., Black/African American, Hispanic/Latino, and American Indian or Alaska Native), both relative to the concentrations of these groups in other occupational or degree

areas and relative to their overall representation in the general population. (National Science Board | Science & Engineering Indicators | NSB-2019-8). According to a recent Pew analysis of the STEM workforce, Hispanic/Latino and Black workers continue to be underrepresented (UR), while White and Asian workers remain overrepresented. In addition, the Pew report raises attention to the long-term outlook for diversity in the STEM workforce being closely tied to representation in the STEM educational system, particularly across the nation's universities and colleges (Pew Research Center, April, 2021, "STEM Jobs See Uneven Progress in Increasing Gender, Racial and Ethnic Diversity").

Long-standing deficits in equitable access to research careers has stymied greater progress in building diverse research teams. To address this, the National Institutes of Health, academic institutions, and professional societies in the biomedical research community have been taking important strides to improve workforce diversity, resulting in a significant increase in PhDs being earned by women and individuals from UR groups (National Research Council, 2011; Gibbs Jr., Basson, Xierali, & Broniatowski, 2016). While progress is evident, today, individuals identifying as Black/African American, Hispanic/Latinx, American Indian/Alaska Native, or Native Hawaiian/Pacific Islander still only account for ~14 percent of PhDs earned in the life sciences (National Science Foundation, National Center for Science and Engineering Statistics, 2018), but account for over 30 percent

of the U.S. population (U.S. Census Bureau, 2017). People with disabilities (PWD) also face similar disparities in representation, comprising ~13 percent of the U.S. population but only ~5 percent of PhDs earned in the biological sciences (National Science Foundation, National Center for Science and Engineering Statistics, 2017). Despite gains made at the PhD level, UR racial

and ethnic minorities still comprise a very low percentage of academic faculty members, with only between 5 and 10 percent representation at the tenured professor level (Gibbs Jr., Basson, Xierali, & Broniatowski, 2016; Valantine, Lund, & Gammie, 2016). This reduced representation at the faculty level exists even for well-represented (WR) White or Asian women.





## WORKFORCE DIVERSITY – A SCIENTIFIC IMPERATIVE

To increase innovation, creativity, and enhance performance in solving scientific problems, studies have shown that the workforce must be diverse and inclusive (Phillips 2014). Success in biomedicine requires ensuring people of every background, particularly individuals from UR groups, are equitably represented in the field and positioned to generate and apply new knowledge to benefit an increasingly diverse society. As described in the National Human Genome Research Institute's Building a Diverse Genomics Workforce: An NHGRI Action Agenda, "the promise of genomics cannot be fully achieved without successfully attracting, developing, and retaining a diverse research workforce that includes people from groups that are underrepresented in the genomics enterprise."

Achieving workforce diversity within genetics and genomics research will accomplish important goals such as: improving the broad scientific and medical enterprise overall by tapping into a rich and more varied range of viewpoints and backgrounds to drive further novel discovery; better draw on the tremendous biological insights found in human genetic diversity to advance biomedical research and improve health; and steer the impact of rewards and benefits accruing from the fields to people everywhere. Greater diversity within genetics and genomics can yield more benefits

including, but not limited to, a broader range of topics and phenomena being researched, more effective problem solving, and increased scientific competitiveness.

Analysis of demographic trends plays a critical role in providing the information needed to understand the dynamic human genetics and genomics workforce landscape. Although national statistics have been reported on the biomedical, scientific, and life sciences workforces, this report is the first baseline assessment of the human genetics and genomics workforce's demographics, based on a fielded survey of individuals identified from an alliance of professional human genetics and genomics membership associations (i.e., American Society of Human Genetics (ASHG), the American College of Medical Genetics and Genomics (ACMG), the National Society of Genetic Counselors (NSGC), the Association of Professors of Human and Medical Genetics (APHMG), the American Board of Medical Genetics and Genomics (ABMGG), and the Minority Genetic Professionals Network (MGPN)). This report describes the gender, racial/ethnic and ancestry, age, educational, and occupational makeup of the human genetics and genomics workforce overall, providing an in depth look into the composition and diversity of the workforce.



# 2

## Methodology

The survey instruments for both the 2021 Workforce Survey for Individuals in Human Genetics and Genomics and the 2021 Genetics and Genomics Workforce Survey for Academic Departments, Programs, Institutions, and Organizations were developed by the ASHG in collaboration with the Statistical Research Center (SRC) of American Institute of Physics (AIP), and approved by the Advisory Group. SRC of AIP independently administered the surveys online and collected the data. The questionnaire for the interviews and focused groups were developed and performed by Flock Theory. All data is being housed in a deidentified manner.

## METHODOLOGY

Various questions address specific developmental periods in the education and careers of genetics and genomics workers as well as ascertains a snapshot of the current demographic landscape of the human genomics workforce. Respondents were informed that participation was voluntary and that they had the option to skip questions (e.g., ethnicity/

ancestry). When  $n < 5$  responses, additional measures were taken to protect individuals' anonymity. To ensure reporting of accurate data, survey respondents were able to answer questions, review previous answers, correct, and modify responses, and return to the survey multiple times to complete it at their convenience.



## 2021 WORKFORCE SURVEY FOR INDIVIDUALS IN HUMAN GENETICS AND GENOMICS

Data for the 2021 Workforce Survey for Individuals in Human Genetics and Genomics was collected using contact databases from partnering organizations. The list of contacts contained 16,860 names and email addresses. Once duplicate names were removed, the final contact list contained 13,431 unique email addresses. The survey was administered in the Spring of 2021. Three reminders were sent to individuals who did not respond and

respondents were given the option to opt out of receiving additional messages about completing the survey. A total of 4,367 members provided responses to the questionnaire, resulting in a response rate of 33%.

Respondents who were not currently employed or enrolled in the field of genetic and genomics only provided demographic data and information on their educational background.

## 2021 GENETICS AND GENOMICS WORKFORCE SURVEY FOR ACADEMIC DEPARTMENTS, PROGRAMS, INSTITUTIONS, AND ORGANIZATIONS

The 2021 Genetics and Genomics Workforce Survey for Academic Departments, Programs, Institutions, and Organizations collected information on:

- The number of employees, faculty members, students, postdocs, and trainees working at institutions in the academic sector and the industry sector.
- The demographics (citizenship, gender identity, and race or ethnicity) of employees and faculty members.

The survey invitation was emailed to leaders of 116 academic departments and programs and

110 institutions and organizations in Spring of 2021. Four reminders were sent to the identified contacts.

A contact database consisting of genetic and genomic academic departments, government institutions, and industry organizations was created to collect data for the 2021 Genetics and Genomics Workforce Survey for Academic Departments, Programs, Institutions, and Organizations. Key words were used to identify these specific groups and included the following: Genetics; Genomics; Human Genetics; Gene Therapy; Epigenetics; Gene Expression; Epigenomics; Gene Regulation; Evolutionary

Genetics; Population Genetics; Population Genomics; Molecular Genetics; Human Genome, Bioinformatics; Computational Biology/ Genomics. An academic genetic or genomic department or institution was defined as any department or program that issues a degree in genetics, genomics, or genetic counseling. A

non-academic genetic or genomic department or institution was defined as any institution that primarily contributes to the genetics and genomics workforce. The response rate for academic departments and organizations was 40% and 15% respectively.

## INTERVIEWS AND FOCUS GROUPS

The interviews and focus groups involved in-depth discussions about workforce culture and climate to understand the factors affecting inclusivity in genetics and genomics professions. Invitations were sent to all survey respondents regardless of identity, asking only those individuals with underrepresented backgrounds in the workforce, based on race, ethnicity and ancestry or disability, to apply to participate in a confidential one-on-one interview or one of three, small (6-10 people) focus groups. Additionally, 40 department chairs and/or program directors from minority serving institutions who were not part of the initial survey were also contacted. Following a screening process, a total of 40 respondents were invited to participate. Designed and managed by Flock Theory, the interviews were conducted in September 2021 and focus groups for students/postdoctoral scholars, early career professionals with less than 10 years experience, and women were conducted in October 2021.


### Limitations

Any attempts to generalize and broadly interpret the results presented in these reports should be done with caution. The study sample included members of organizations and thus was not necessarily representative of the national genetic and genomics workforce. The results may be impacted by a sampling bias which occurs when some members of a population are systematically more likely to be selected in a sample than others or, in this case, when some members are more likely to respond to survey questions. This is specifically known as self-selection sampling bias. The findings from biased samples can only be generalized to populations that share characteristics.






# 3



## Results from the 2021 Workforce Survey for Individuals in Human Genetics and Genomics



## CHARACTERISTICS OF SURVEY RESPONDENTS

This section provides details on specific characteristics about those who responded to the 2021 Workforce Survey for Individuals in Human Genetics and Genomics. A total of 4,367 members provided responses to the questionnaire, resulting in a response rate of 33.0%. At the time the survey was administered, 76.0% (n=3,319) respondents indicated that they were currently employed, training, or studying in the U.S., and 12.7% (n=553) respondents were not currently employed, training, or studying in the U.S. 11.3% (n=495) did not provide their current location.

### Citizenship and Race, Ethnicity, and Ancestry

Of the total respondents, 73.3% (n=3,202) reported holding a U.S. citizenship and 26.7% (n=1,165) reported holding a citizenship outside of the U.S. Respondents reported holding primary citizenships in 89 countries. The 13 most common countries of citizenship are presented in **Table 1**.

**Table 1: 13 Most Common Countries of Citizenship Reported by Survey Respondents**

	<b>N</b>	<b>Percentage</b>
United States	3,202	73.3%
Canada	229	5.2%
China	80	1.8%
India	72	1.6%
Japan	54	1.2%
Italy	37	0.8%
Germany	31	0.7%
United Kingdom	30	0.7%
Australia	30	0.7%
Mexico	26	0.6%
Brazil	24	0.5%
South Korea	23	0.5%
France	22	0.5%

*Note: Percentages are based on total number of respondents (n=4,367). 165 respondents did not provide their country of citizenship (3.8%).*

Those respondents who indicated their primary citizenship was the United States (n= 3,202) were also asked to select which races, ethnicities, or ancestries best described them. To ensure the survey was as inclusive as possible, respondents were able to select more than one race, ethnicity, or ancestry category. Respondents

were also able to write in a description of their race, ethnicity, or ancestry. **Table 2** depicts how many U.S. citizen respondents selected one race, ethnicity, or ancestry option, how many chose two, and how many selected three. **Table 3** depicts the race/ ethnicity options as they were presented in the administered survey.

**Table 2: Count of Race, Ethnicity, Ancestry Selected**

	<b>N</b>
Selected 1 race, ethnicity, ancestry option	2,961
Selected 2 race, ethnicity, ancestry options	157
Selected 3 race, ethnicity, ancestry options	13
<b>Total Participants who answered the race, ethnicity, or ancestry question:</b>	<b>3,131</b>

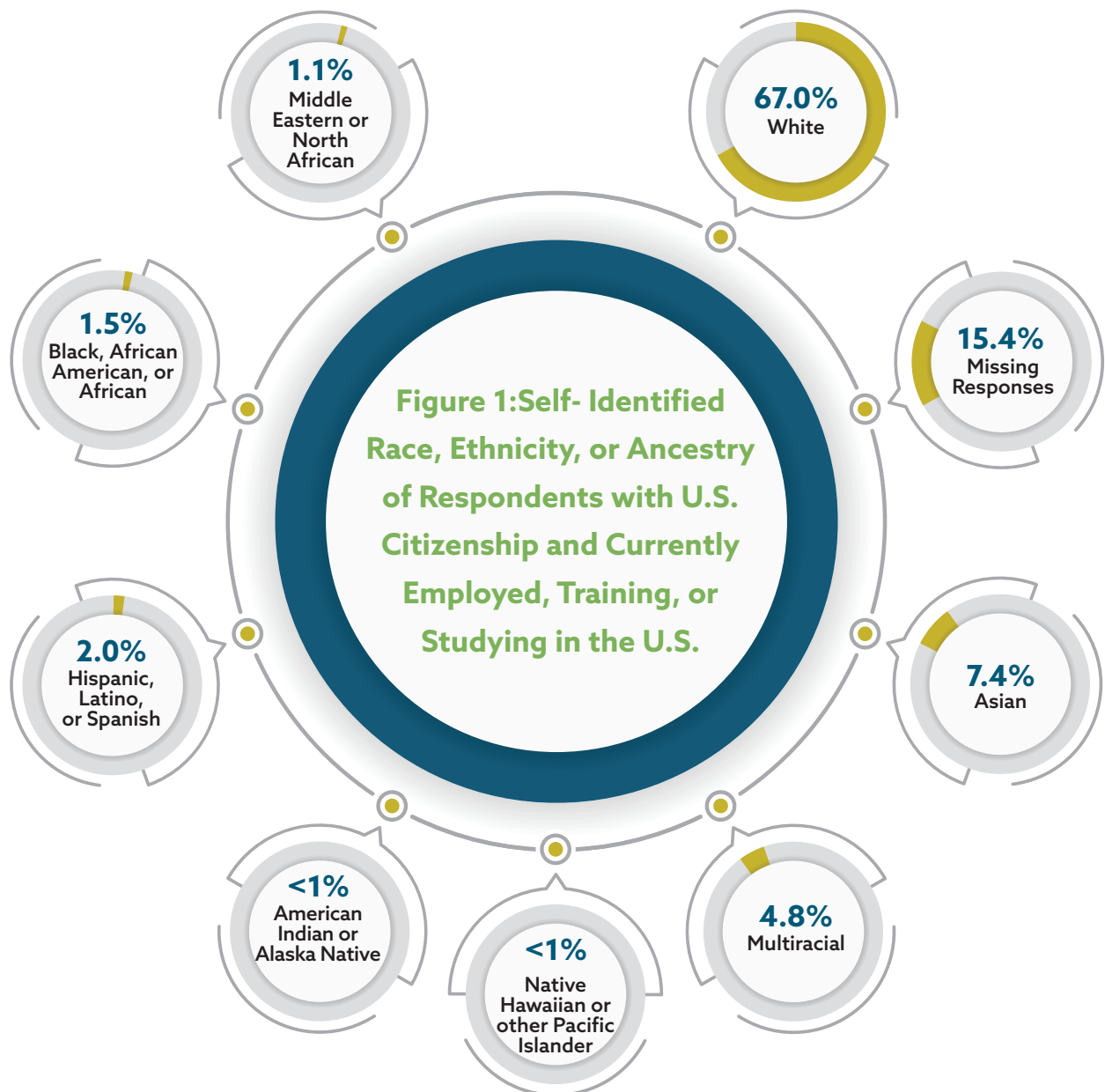
*Note: 67 respondents opted not to identify their race, ethnicity, or ancestry.*

**Table 3: Race, Ethnicity, and Ancestry as They Appeared in Administered Survey**

Race, Ethnicity, and Ancestry:	
American Indian or Alaska Native	<b>American Indian or Alaska Native</b> - for example, Aztec, Blackfeet Tribe, Mayan, Navajo Nation, Native Village of Barrow (Utqiagvik) Inupiat Traditional Government, Nome Eskimo Community, etc.
Asian	<b>Asian</b> - for example, Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, etc.
Black, African American, or African	<b>Black, African American, or African</b> - for example, African American, Ethiopian, Haitian, Jamaican, Nigerian, Somali, etc.
Hispanic, Latino, or Spanish	<b>Hispanic, Latino or Spanish</b> - for example, Columbian, Cuban, Dominican, Mexican or Mexican American, Puerto Rican, Salvadoran, etc.
Middle Eastern or North African	Middle Eastern or North African- for example, Algerian, Egyptian, Iranian, Lebanese, Moroccan, Syrian, etc.
Native Hawaiian or other Pacific Islander	<b>Native Hawaiian or Other Pacific Islander</b> - for example, Chamorro, Fijian, Marshallese, Native Hawaiian, Tongan, etc.
White	<b>White</b> - for example, English, European, French, German, Irish, Italian, Polish, etc.

**Figure 1** shows the race, ethnicity, and ancestry of survey respondents who were employed, training, or studying in the U.S. at the time the survey was administered. To code the race, ethnicity, or ancestry variable for analysis, a multiracial category was created and includes everyone who selected two or more options. For example, an individual who selected both Black and White is placed in the multiracial category,

and it is not assumed that the individual identifies solely as Black or White. Respondents who identified as American Indian or Alaska Native; Native Hawaiian or other Pacific Islander; or other (write in option) were included in all the analyses that were conducted, but due to small sample size and to protect the identity of respondents, results in these categories have been removed from the report.







## Gender Identity and Sexual Orientation

Respondents were also asked to describe their gender identity. The majority of respondents who were currently employed, training, or studying in the U.S. at the time of the survey identified as women (74.7%) and 23.3% identified as men. Eighteen (0.5%) respondents identified as non-binary, transgender, or another

gender identity (Table 4). Additionally, 228 respondents (6.9%) reported identifying as Lesbian, Gay, Bi-Sexual, Transgender, Queer, Intersex, Asexual (LGBTQIA). Respondents who identified as nonbinary or transgender were included in all the analysis that were conducted, but due to small sample size and to protect the identity of respondents, results in these categories have been removed from the report.

**Table 4: Gender Identity or Sexual Orientation of Respondents Currently Employed, Training, or Studying in the U.S.**

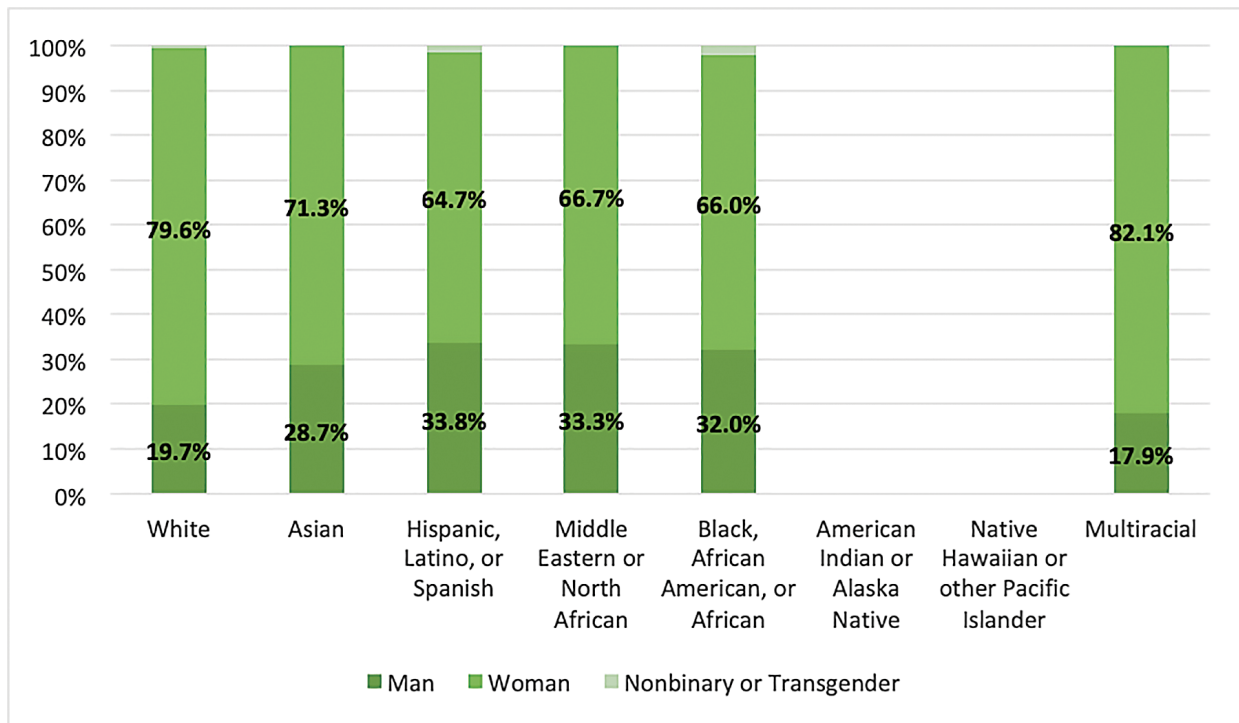
	<b>N</b>	<b>Percentage</b>
Men	774	23.3%
Women	2,480	74.7%
Nonbinary or Transgender	18	0.5%
Missing responses	47	1.4%

*Note: Percentages are based on number of respondents currently employed, training, or studying in the U.S. (n=3,319).*

Among survey respondents who identified as White, 19.7% also identified as Men, 79.6% identified as Women, and 0.7% identified as nonbinary or transgender. Among those who identified as Asian 28.7% identified as Men

and 71.3% identified as Women. The results of the gender identity of survey respondents categorized by race, ethnicity, and ancestry is depicted in Figure 2.

**Figure 2: Distribution of Self-Reported Race, Ethnicity, and Ancestry by Gender Identity among Respondents**

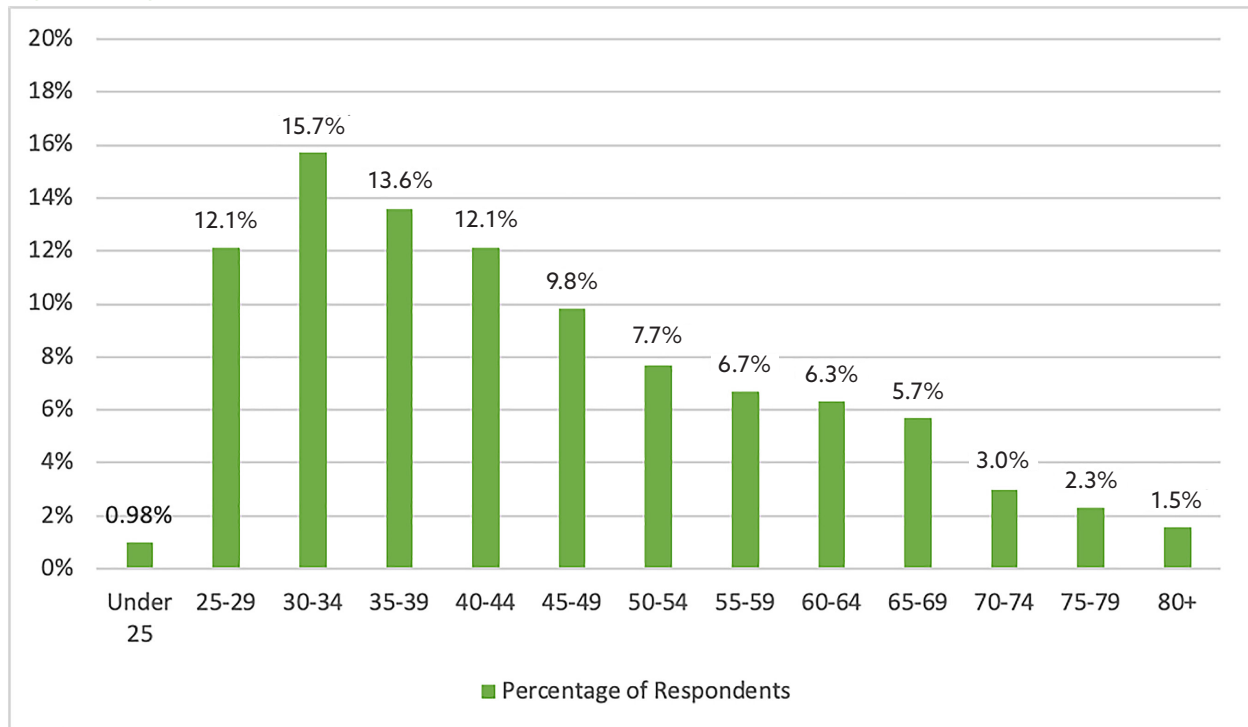


Note: Percentages are based on number of respondents currently employed, training, or studying in the U.S. (n=3,319). To protect the identity of respondents, data for the following groups was suppressed: American Indian or Alaska Native; Native Hawaiian or other Pacific Islander; and Nonbinary or Transgender.

## Age

The age of respondents ranged from under 25 to over 80 years old with a mean age of 42.9 years. Responses are presented in age groups in **Figure 3**.

**Figure 3: Age Distribution of Respondents**



Note: Percentages are based on the total number of respondents ( $n=4,367$ ). 112 respondents did not provide their age (3%).

## Disabilities, Accessibility Aids, and Accommodations

113 respondents currently employed, training, or studying in the U.S. indicated that they had a disability (3.4%). Of those who reported having disabilities, impairments, and conditions, 34.5% ( $n=39$ ) of respondents reported autoimmune, pain disorders, or other chronic conditions and 29.2% ( $n=33$ ) reported having mental illness.

Of the respondents who indicated that they had a disability, 61.1% ( $n=69$ ) indicated that they used accessibility aids. The most reported accessibility aids were dietary accommodations related to

health or disability used by 31.9% ( $n=22$ ), quiet spaces used by 30.4% ( $n=21$ ), and environmental adjustments used by 28.9% ( $n=20$ ).

Of the respondents who used accessibility aids, 45 respondents (65.2%) asked for and received accessibility accommodations at work or school, while 14 respondents (20.3%) had asked for but had not received them. Additionally, of the respondents who used accessibility aids, 35 respondents (50.7%) indicated that they did not want or need the accommodations at work or school, while 16 respondents (23.2%) thought they would benefit from accommodations but

had not asked for them, and 17 respondents (24.6%) were afraid of disclosing their disabilities or chronic conditions.

## Disadvantaged Backgrounds

Survey respondents were also asked if they were from disadvantaged backgrounds. To be considered from a disadvantaged background

respondents had to select two or more of the experiences listed in **Table 5**. Of the 3,319 respondents who were employed, training, or studying in the U.S. at the time the survey was administered, 400 respondents (12.1%) indicated that they were from disadvantaged backgrounds. Additionally, 53 respondents (1.6%) indicated that they preferred not to share this information.

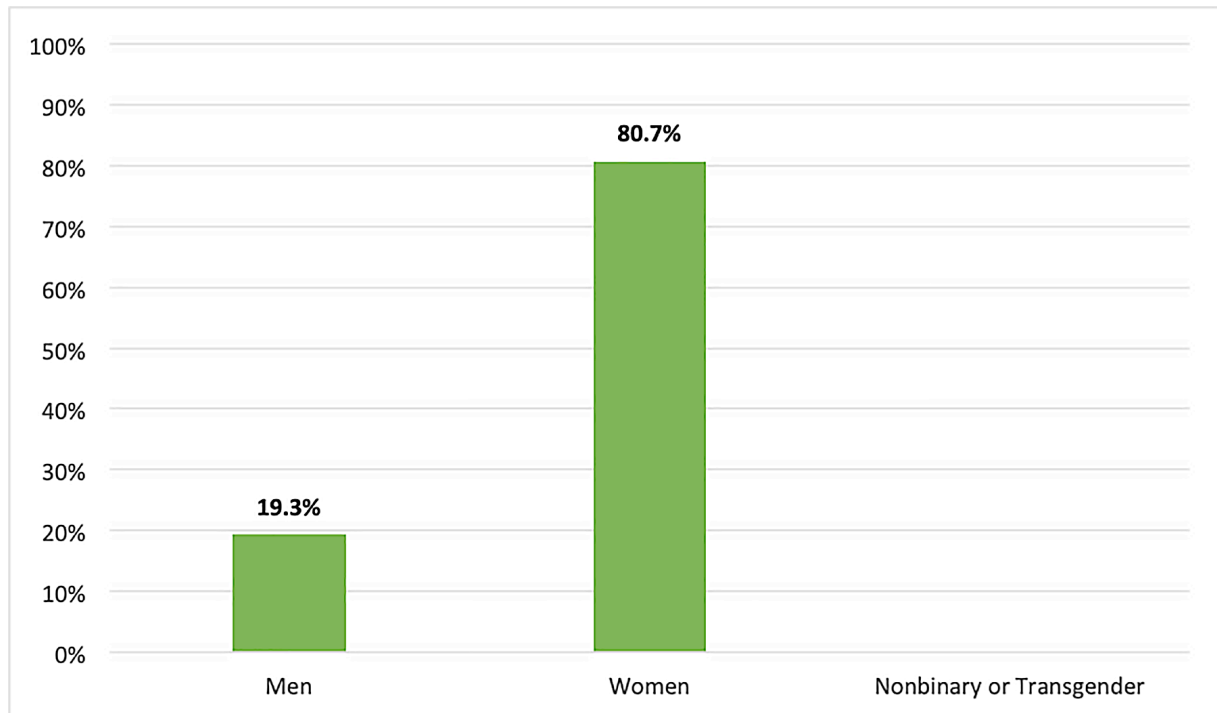
**Table 5: Percentage of Respondents who Selected at least one Disadvantaged Item**

	<b>N</b>	<b>Percentage</b>
Were or currently are homeless	14	0.4%
Were in the foster care system	6	0.2%
Were eligible for the Federal Free and Reduced Lunch Program for two or more years	160	4.8%
Have or had no parents or legal guardians who completed a bachelor's degree	511	15.4%
Were or currently are eligible for Federal Pell grants	337	10.2%
Received support from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) as a parent or child	99	3.0%
Grew up in a U.S. rural area	434	13.1%
Grew up in a designated low-income rural area	168	5.1%

*Note: Percentages are based on total number of respondents who were employed, studying, or training in the US at the time the survey was administered (n=3,319). Options were not mutually exclusive and respondents could select more than one.*

Women were more likely to report that they were from a disadvantaged background (Figure 4).

**Figure 4: Percentage of Respondents by Gender Identity Who Were from Disadvantaged Backgrounds**

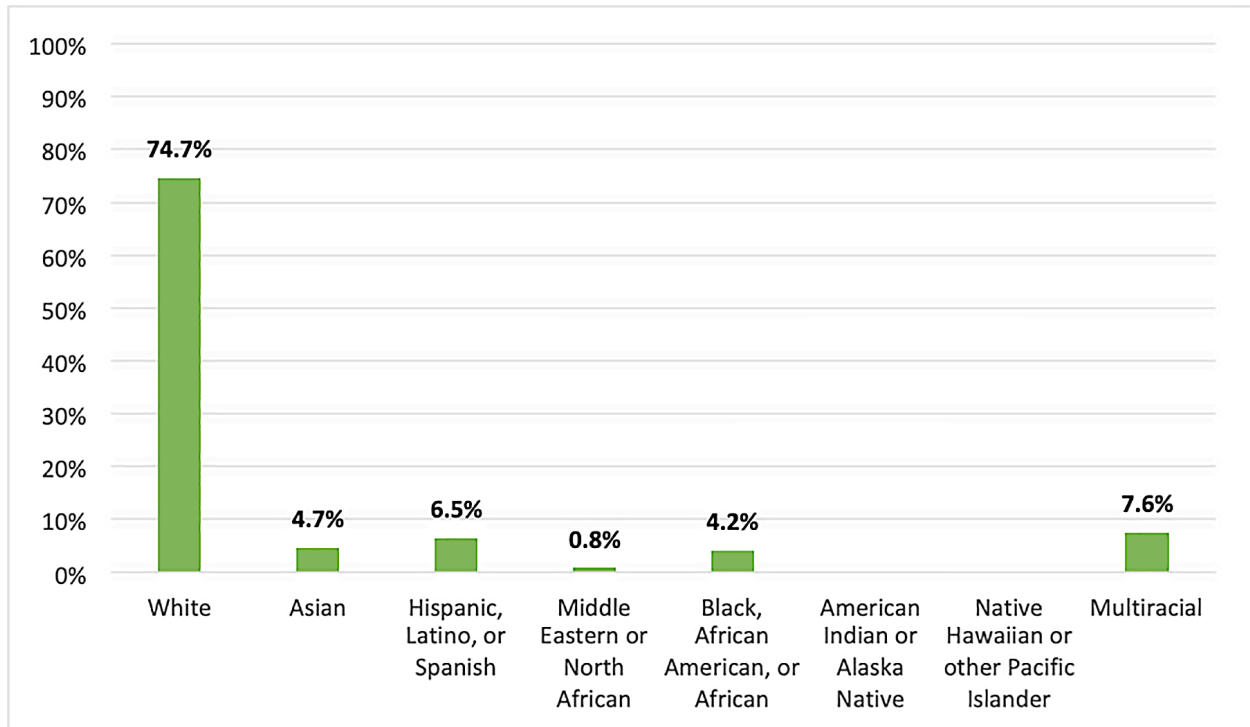


*Note: Percentages are based on the number of respondents who identified their gender identity or sexual orientation and fit the criteria for being from a disadvantaged background. To protect the identity of respondents, data for the following groups was suppressed: Nonbinary or Transgender (n=394).*



Respondents who identified as White were more likely to report they were from a disadvantaged background (Figure 5).

**Figure 5: Percentage of Respondents by Race, Ethnicity, or Ancestry Who Were from Disadvantaged Backgrounds**



Note: Percentages are based on the number of respondents identified their racial, ethnic, or ancestral identity and fit the criteria for being from a disadvantaged background (n=383). To protect the identity of respondents, data for the following groups was suppressed: American Indian or Alaska Native; Native Hawaiian or other Pacific Islander.



## Employment Situation

Most respondents (82.7%; n=2,745) indicated that they were employed in a permanent position in the field of genetics and genomics. An additional 1.3% of respondents (n=43) indicated that they were employed in a temporary position in the field (**Table 6**). Together, these two groups are referred to as employed respondents throughout this report

(n=2,788). An equal portion of respondents were enrolled in graduate or medical school (7.5%; n=268) and enrolled or employed in a temporary training program (e.g., postdoctoral appointment, fellowship, or residency) (7.9%; n=261) (**Table 6**). Together, these two groups are referred to as students or trainees throughout this report (n=529).

**Table 6: Respondent's Primary Position in the Field of Genetics and Genomics**

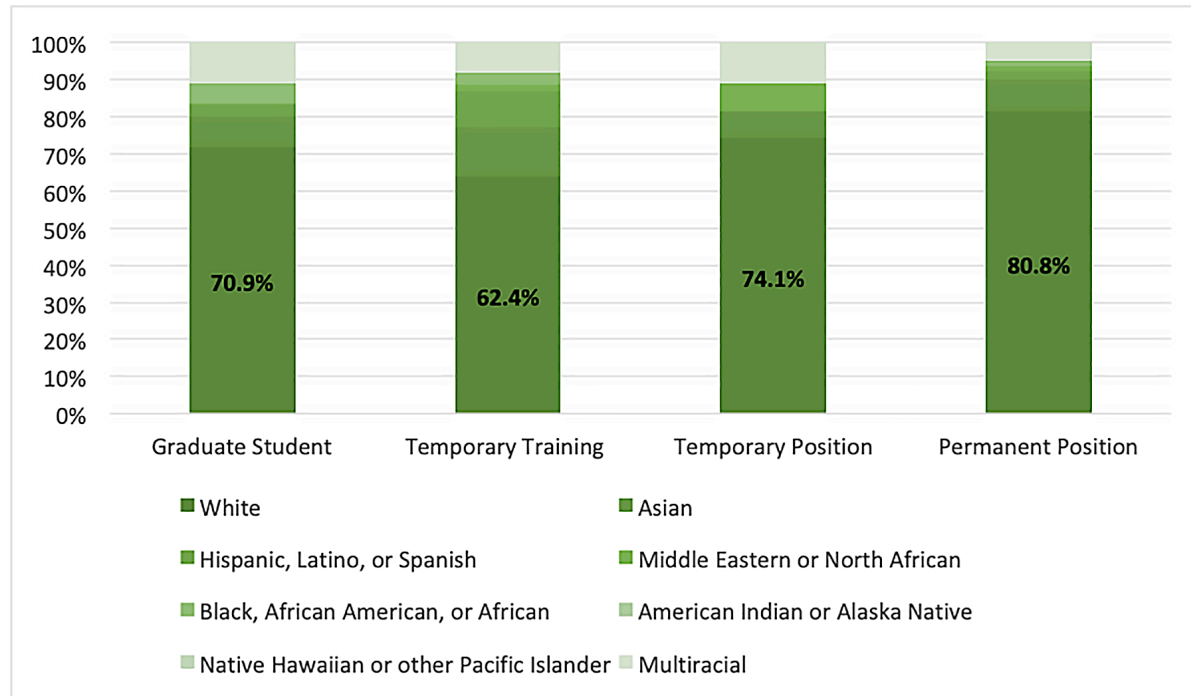
	<b>N</b>	<b>Percentage</b>
Permanent Position	2,745	82.7%
Temporary Position	43	1.3%
Graduate or Medical Student	268	8.1%
Temporary training program	261	7.9%

*Note: Percentages are based on the number of respondents who were employed, studying, or training in the U.S. at the time the survey was administered (n=3,319).*

Of the respondents who held a permanent position in the U.S. at the time the survey was administered, 80.8% identified as White and 77.0% identified as Women. Additionally, of those studying in the U.S. at the time the survey was administered, 70.9% identified as White and

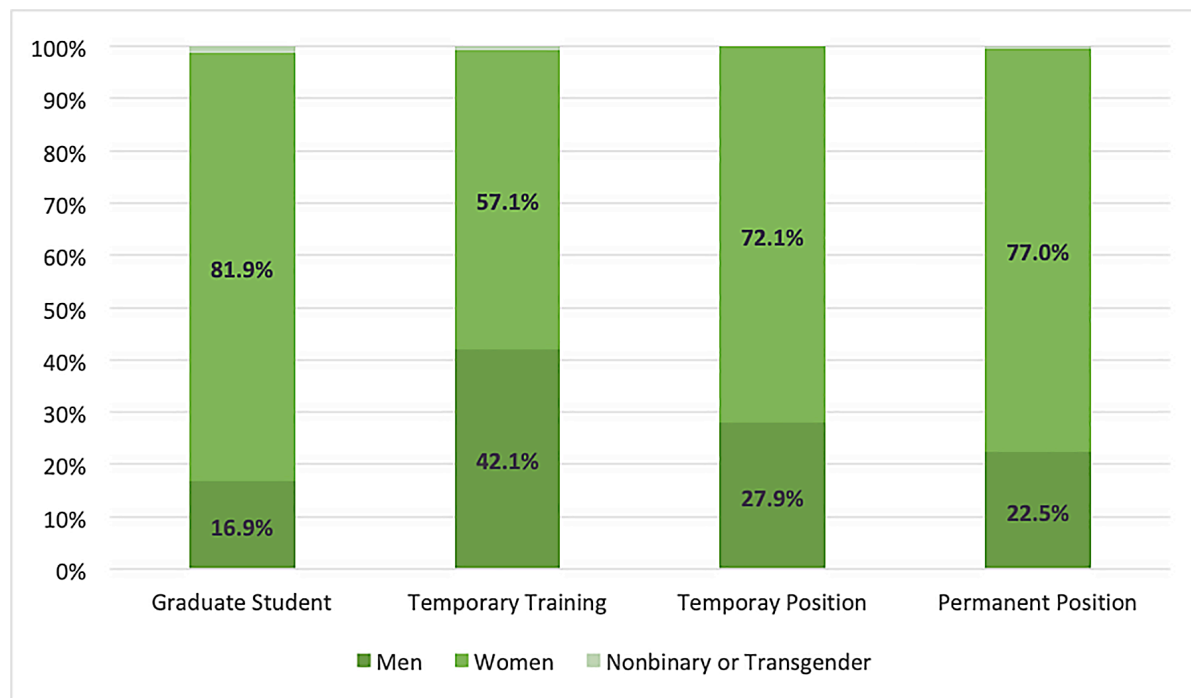
81.9% identified as Women. Within each primary position in the field of genetics and genomics, the percentages of race, ethnicity, or ancestry and the percentages of gender identify are depicted in the corresponding figures.

**Figure 6: Distribution of Respondents by Race, Ethnicity or Ancestry within the Primary Position within the Field of Genetics or Genomics**



Note: Percentages are based on the number of respondents who identified their racial, ethnic, or ancestral identity and provided their primary position within the field of genetics and genomics (n=2,809).

**Figure 7: Distribution of Respondents by Gender Identify within Primary Position within the Field of Genetics or Genomics**



Note: Percentages are based on the number of respondents who identified their gender identity and provided their primary position within the field of genetics and genomics (n=3,272).



### Special Certification

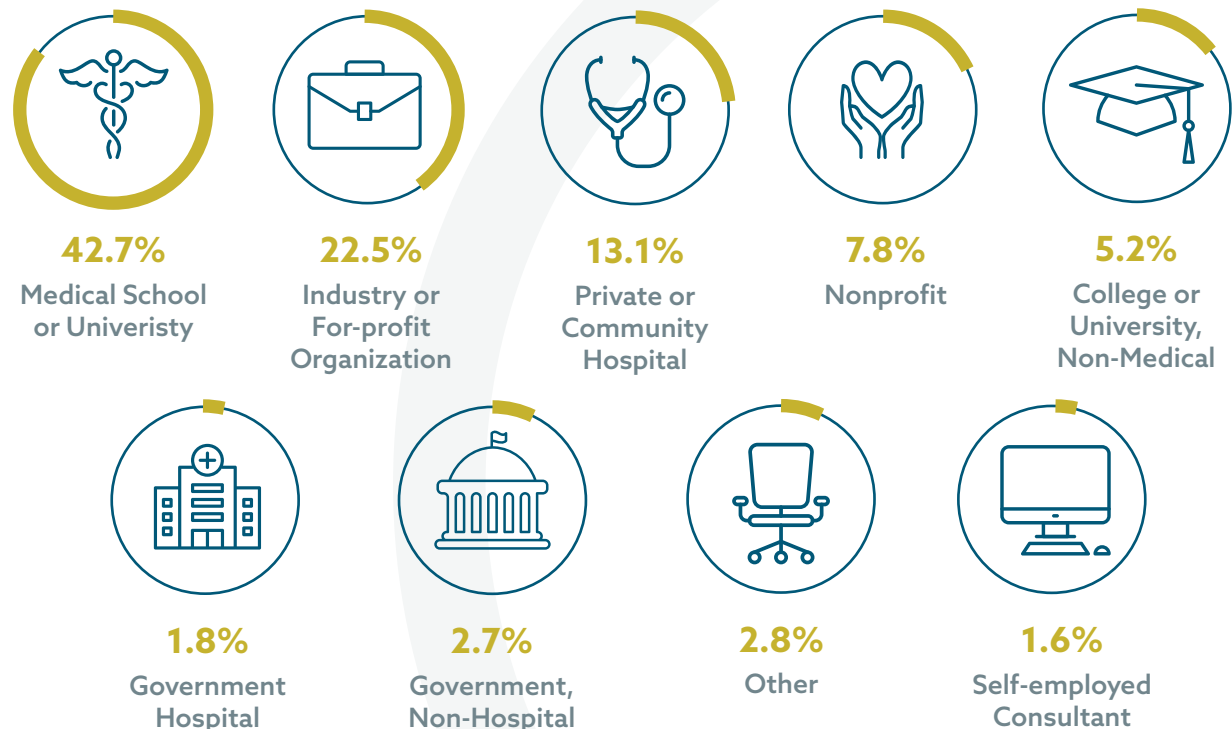
Across all primary positions in the field of genetics and genomics, 2,057 respondents (62.0%) who were employed, studying, or training in the US at the time the survey was administered reported they had earned special certifications (e.g., CGC).

## EMPLOYER, AREA OF WORK, AND SPECIALTIES OR INTERESTS

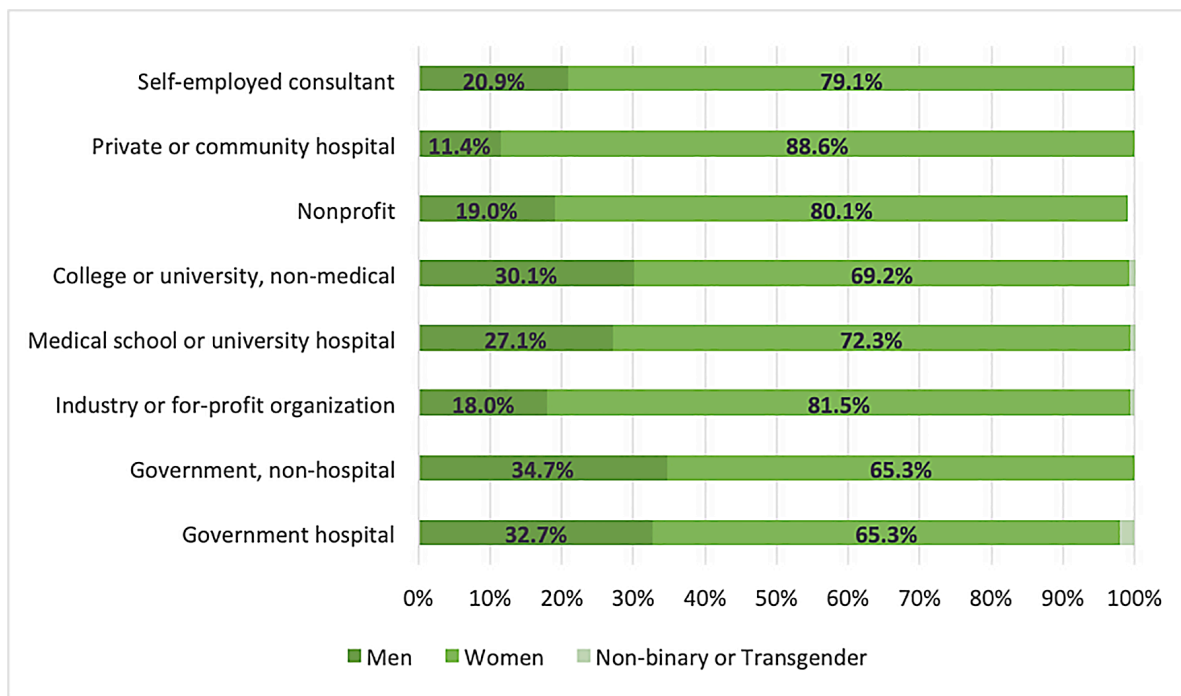
### Current Primary Employer

The most commonly reported current primary employers were medical school or university hospitals (42.7%; n=1,189) and industry or for-profit organizations (22.5%; n=626). The employers are presented in **Figure 12**.

**Figure 8: Primary Employer of Employed Respondents**



Note: Percentages are based on the total number of respondents employed in the U.S. at the time the survey was administered (n=2,788).

**Figure 9: Gender Identity within Primary Employer**

Note: Percentages are based on the number of respondents who provided their gender identity and provided their primary employer (n=2,759).

## Employed Respondents' Primary Areas of Work

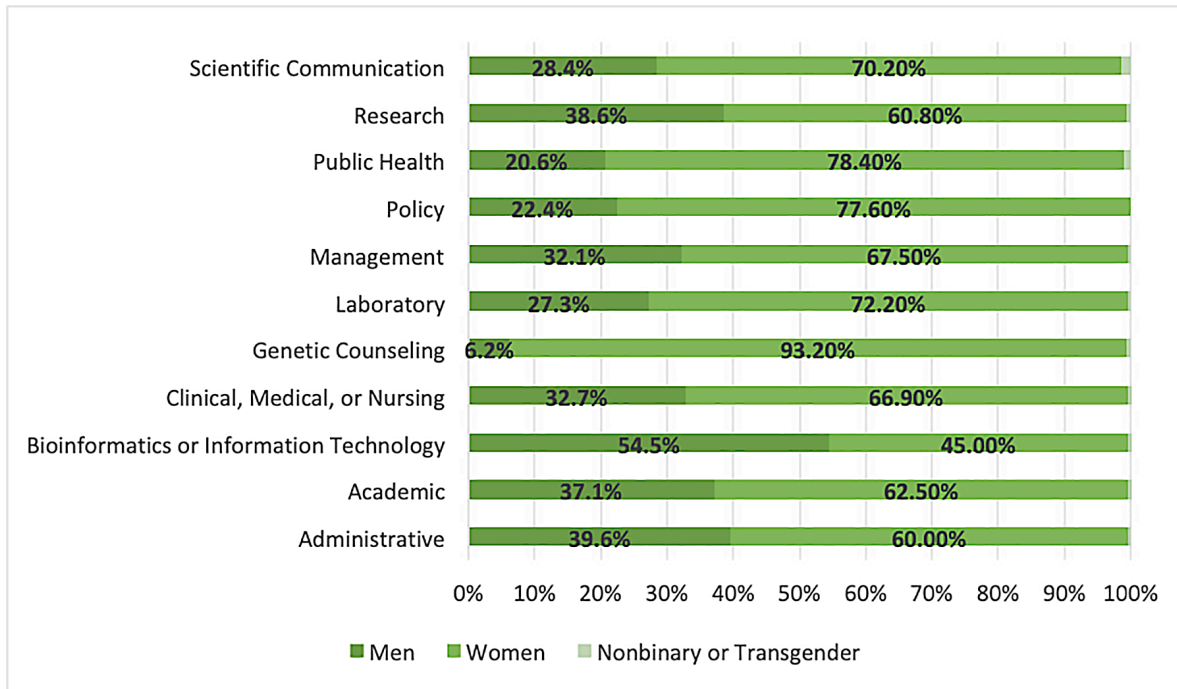
Employed respondents most reported that their primary areas of work were in genetic counseling (45.7%; n=1,273) and research (30.4%; n=848). The primary areas of work are presented in **Table 7**.

**Table 7: Primary Area of Work of Employed Respondents'**

	N	Percent
Genetic Counseling	1,273	45.7%
Research	848	30.4%
Academic	652	23.4%
Clinical, Medical, or Nursing	656	23.6%
Laboratory	638	22.9%
Administrative	264	8.0%
Management	241	8.7%
Bioinformatics or Information Technology	210	7.5%
Scientific Communication	228	8.3%
Public Health	104	3.7%
Policy	50	1.8%
Other	81	2.9%

Note: Percentages are based on the total number of respondents employed in the U.S. at the time the survey was administered (n=2,788). 1,212 employed respondents selected more than one primary area of work.

**Figure 10: Gender Identity within Primary Area of Work**



Note: Percentages are based on the total number of employed respondents in the U.S. who provided their primary area of work and their gender identity (n=2,757).



## PROMOTIONS

Of the respondents who were employed in a temporary or permanent position, 1,801 employed respondents (64.9%) indicated that they had previously been employed at a different workplace or institution within the field of genetics or genomics. Most of the respondents previously employed in the field of genetics or genomics started at their first workplace between 2010 and 2014 (22.2%; n=397).

Respondents temporarily or permanently employed in the field of genetics and genomics in the U.S. at the time the survey was administered were asked questions about their experiences with promotions. The following are some observations:

- 1,839 employed respondents (66.0%) indicated that they had been promoted at least once
- 715 (25.6%) employed respondents were promoted at their previous workplace
- 496 (17.8%) employed respondents were promoted when they accepted the position at their current workplace.
- 449 (16.1%) employed respondents had never been promoted

The number of promotions received is depicted in **Table 8**.

**Table 8: Distribution of Promotions among U.S. Employed Respondents**

	<b>N</b>	<b>Percent</b>
0	449	16.1%
1	680	24.4%
2	548	19.7%
3	310	11.1%
4	145	5.2%
5	88	3.2%
6	31	1.1%
7	11	0.4%
8	8	0.3%
10	17	0.6%

*Note: Percentages are based on the total number of employed respondents (n=2,788).*

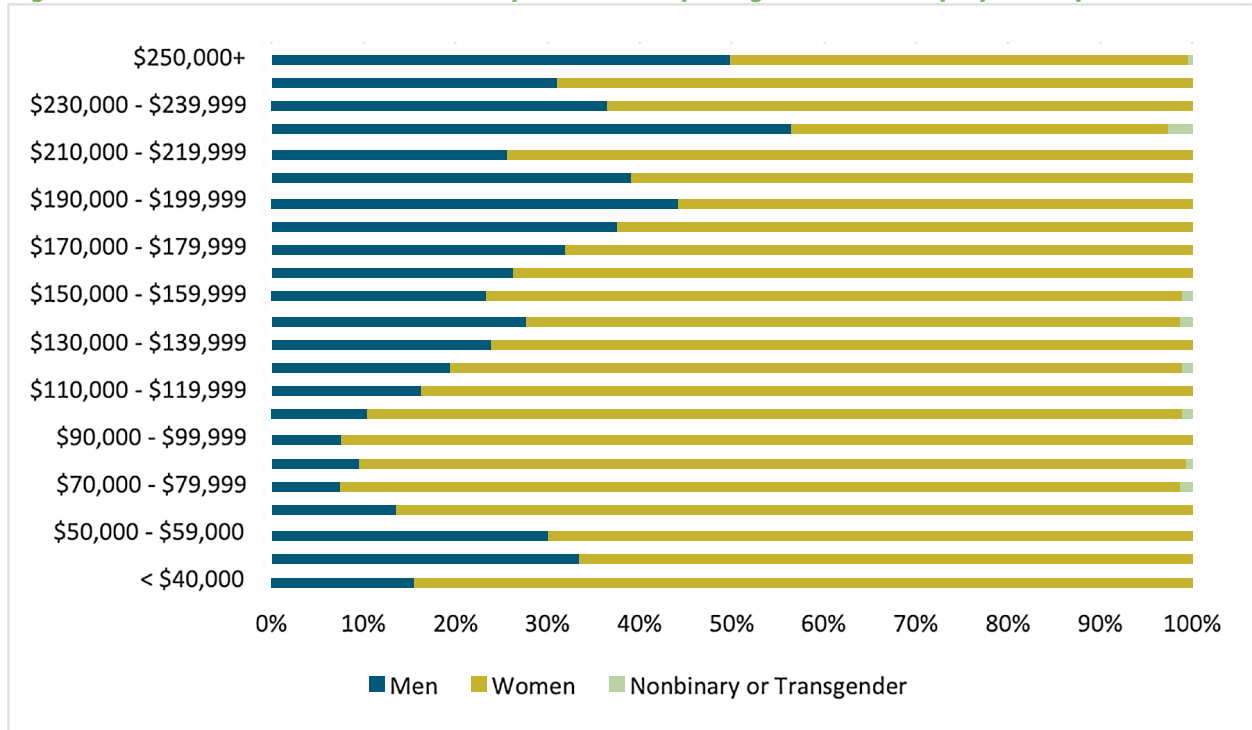
## COMPENSATION

2,668 employed respondents (95.7%) indicated that they received compensation for their work in the field of genetics and genomics. Of the respondents that received compensation, 119 respondents (4.3%) indicated that they received hourly compensation, which ranged from less than \$20 to \$200 per hour, with the median hourly compensation of \$47 per hour. Of those who received hourly compensation, 19 respondents (0.7%) preferred to not provide this information.

In addition to employees who were compensated hourly, 2,549 respondents (91.4%) of the employed respondents who reported receiving compensation received an annual salary, which ranged from less than \$40,000 to over \$250,000 per year, with the median salary of \$110,000 per year (**Table 9**). Of the respondents who indicated they received an annual salary, 406 respondents (14.6%) opted not to provide their exact salary. Those respondents were asked to provide their salary range instead. Salary ranges are presented in **Table 9** for both respondents who wrote in their specific salaries as well as those who provided salary ranges.

**Distribution of Salary Range among U.S. Employed Respondents**

	N	Percent (n=2907)
< \$40,000	13	0.5%
\$40,000 - \$49,000	9	0.3%
\$50,000 - \$59,000	20	0.7%
\$60,000 - \$69,000	74	2.7%
\$70,000 - \$79,999	244	8.6%
\$80,000 - \$89,999	298	10.7%
\$90,000 - \$99,999	250	9.0%
\$100,000 - \$109,000	210	7.5%
\$110,000 - \$119,999	117	4.2%
\$120,000 - \$129,999	119	4.3%
\$130,000 - \$139,999	117	4.2%
\$140,000 - \$149,999	77	2.8%
\$150,000 - \$159,999	103	3.7%
\$160,000 - \$169,999	92	3.3%
\$170,000 - \$179,999	95	3.4%
\$180,000 - \$189,999	85	3.0%
\$190,000 - \$199,999	51	1.8%
\$200,000 - \$209,999	72	2.6%
\$210,000 - \$219,999	40	1.4%
\$220,000 - \$229,999	41	1.5%
\$230,000 - \$239,999	33	1.2%
\$240,000 - \$249,999	36	1.3%
\$250,000+	209	7.5%

**Figure 11: Distribution of Gender Identity within Salary Ranges for U.S. Employed Respondents**

Note: Percentages are based on the total number of employed respondents who provided their salary information and their gender identity (n=2,428).

## Students and Trainees

244 respondents (46.1%) who were enrolled in graduate school, medical school, or a temporary training program indicated that they received financial reimbursements, scholarships, or tuition waivers from their program. In addition, 349 respondents (66%) enrolled in graduate school, medical school, or a temporary training program indicated that they received a salary or

financial compensation (**Table 10**). Of those who said that they received financial compensation, 58 respondents (11%) indicated that they preferred not to share their exact compensation. The compensation amounts ranged from less than \$10,000 to over \$80,000 per year, with the median compensation of \$52,000 per year. The compensation ranges collected are presented in **Table 10**.



**Table 10: Distribution of Salary Range Among those Enrolled in Graduate School, Medical School, or a Temporary Training Program**

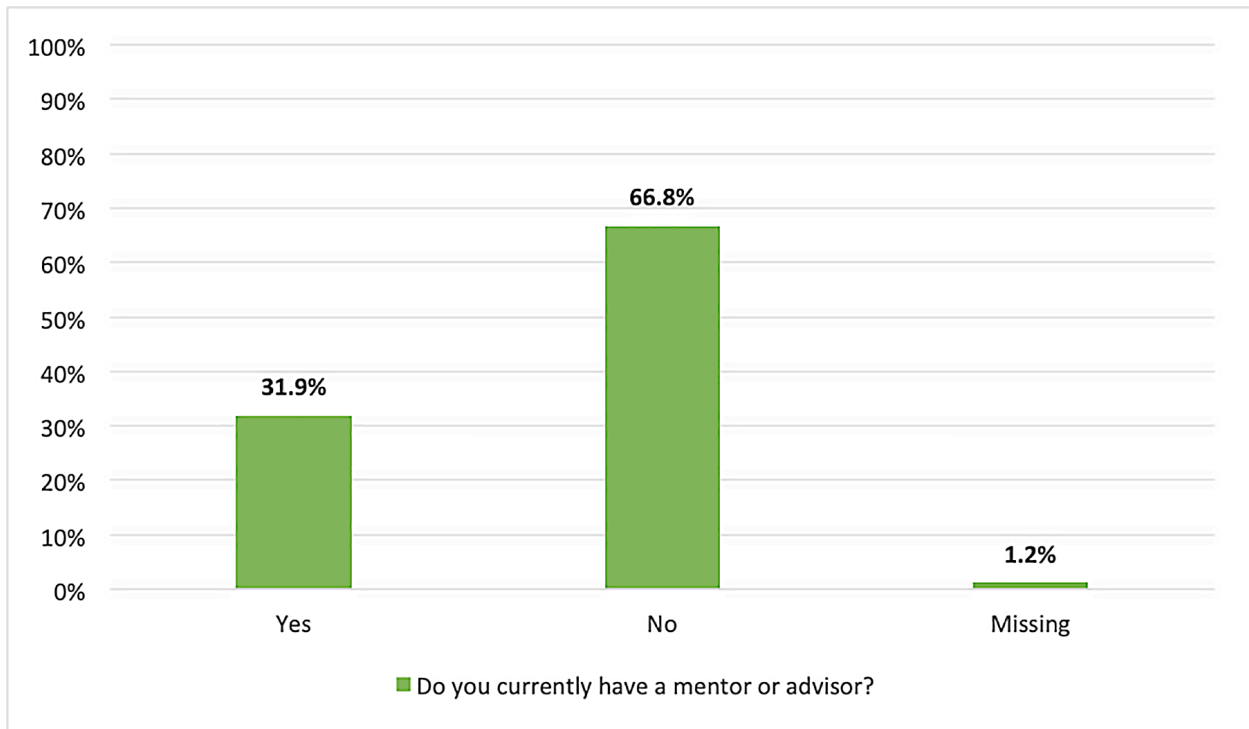
	<b>N</b>	<b>Percent (n=649)</b>
< 10,00 - 19,999	19	3.6%
\$20,000 - \$29,999	26	4.9%
\$30,000 - \$39,999	67	12.7%
\$40,000 - \$49,999	14	2.6%
\$50,000 - \$59,999	92	17.4%
\$60,000 - \$69,999	53	10.0%
\$80,000+	21	4.0%



## MENTORS AND ADVISORS:

Of the 3,319 respondents who were employed, training, or studying in the US at the time of the survey 31.9% (n=1,060) indicated that they had a mentor or advisor (Figure 13).

**Figure 12: Distribution of Respondents who Reported having an Advisor or Mentor**



*Note: Percentages are based on the total number of respondents employed, studying, or training in the U.S. at the time the survey was administered (n=3,319).*

The respondents who indicated that they had a mentor or advisor were asked to describe how they connected with them. The response options included: a mentor from my area or department was formally assigned to mentor me; a mentor from my area or department whom I asked to mentor me; a mentor from another area or department formally assigned to mentor me; a mentor from another area or department whom I asked to mentor me; or other. Written in responses included having multiple mentors, current supervisor, former supervisor, and informal mentor. The responses are detailed in Table 11.



**Table 11: Method Used for Obtaining Primary Mentor or Advisor**

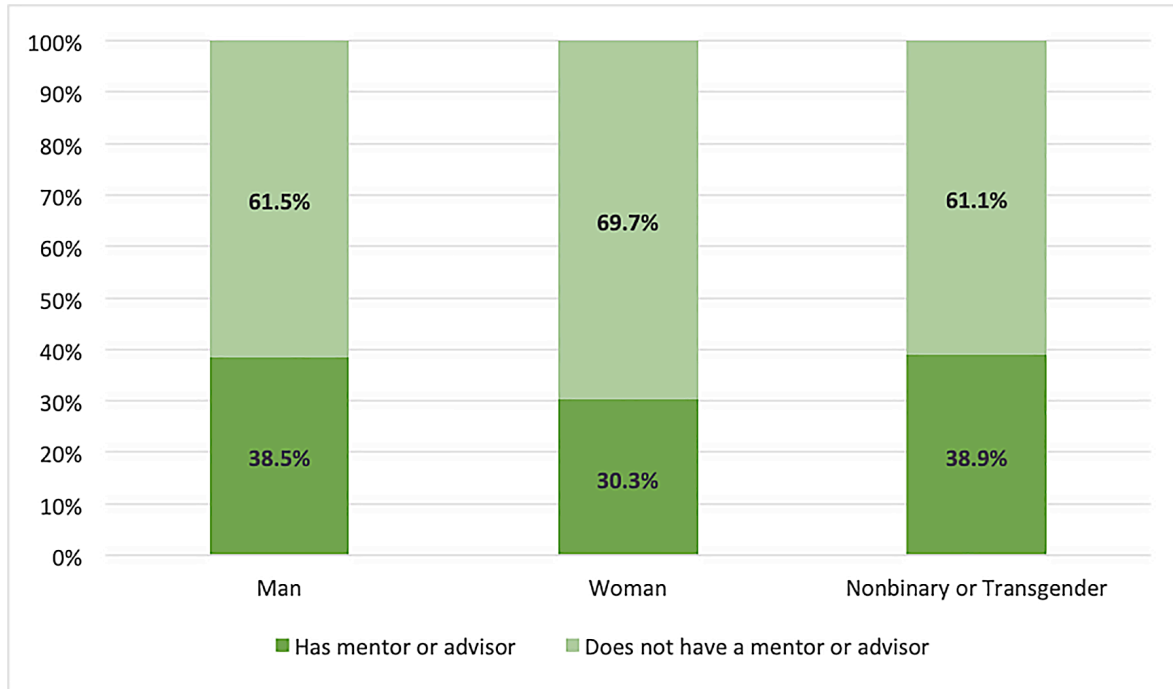
A mentor from my area or department was formally assigned to mentor me	38.0%
A mentor from my area or department whom I asked to mentor me	36.4%
A mentor from another area or department formally assigned to mentor me	3.8%
A mentor from another area or department whom I asked to mentor me	13.0%
Other	8.9%

The following observations were made about mentor or advisor status of respondents (Figures 14 and 15):

- 38.5% of men reported having a mentor or advisor.
- 30.3% of women reported having a mentor or advisor.
- 38.9% of nonbinary or transgender respondents reported having a mentor or advisor.
- 26.5% of those who identified as White indicated they had a mentor or advisor.
- 31.3% of those who identified as Asian indicated they had a mentor or advisor.
- 45.5% of those who identified as Hispanic, Latino, or Spanish indicated they had a mentor or advisor.
- 26.5% of those who identified as Middle Eastern or North African indicated they had a mentor or advisor.
- 60.0% of those who identified as Black, African American, or African indicated they had a mentor or advisor.
- 38.8% of those who identified with multiple racial, ethnic, or ancestry groups indicated they had a mentor or advisor.

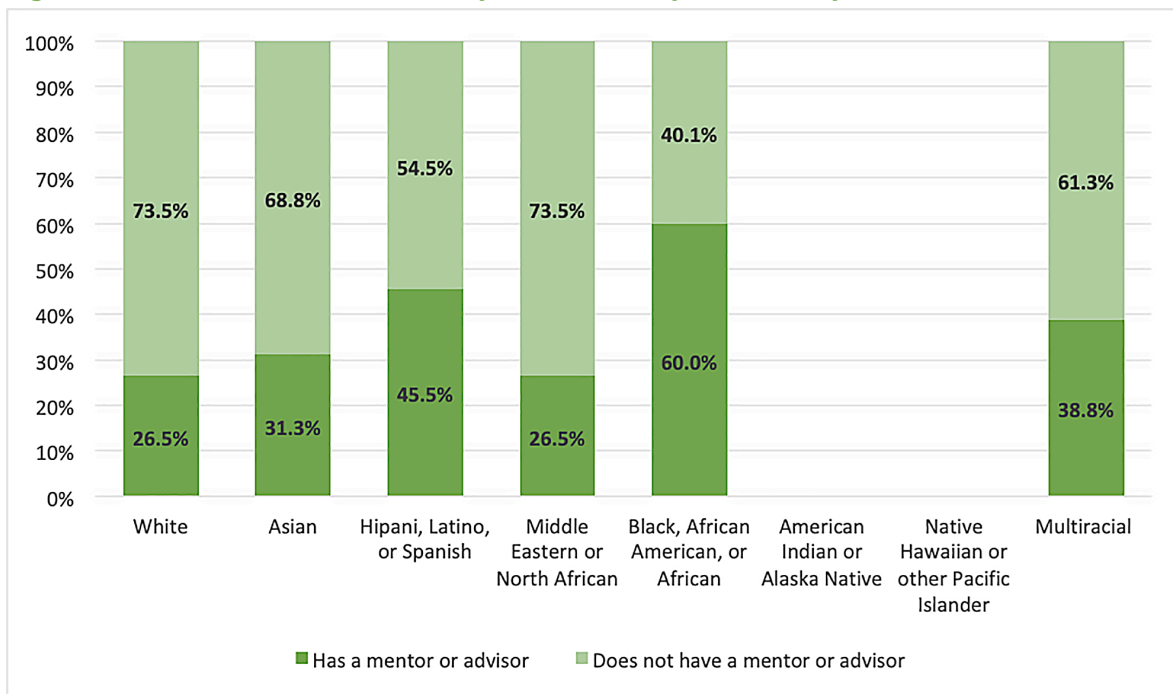


Figure 13: Mentor or Advisor Status by Gender Identity



Note: Percentages are based on the total number of men, women, and nonbinary or transgender respondents that answered this survey question (n=3,246).

Figure 14: Mentor or Advisor Status by Race, Ethnicity, or Ancestry



Note: Percentages are based on the total number of each race, ethnicity, or ancestry identity that answered this survey question (n=2,790). To protect the identity of respondents, data for the following groups was suppressed: American Indian or Alaska Native; and Native Hawaiian or other Pacific Islander.

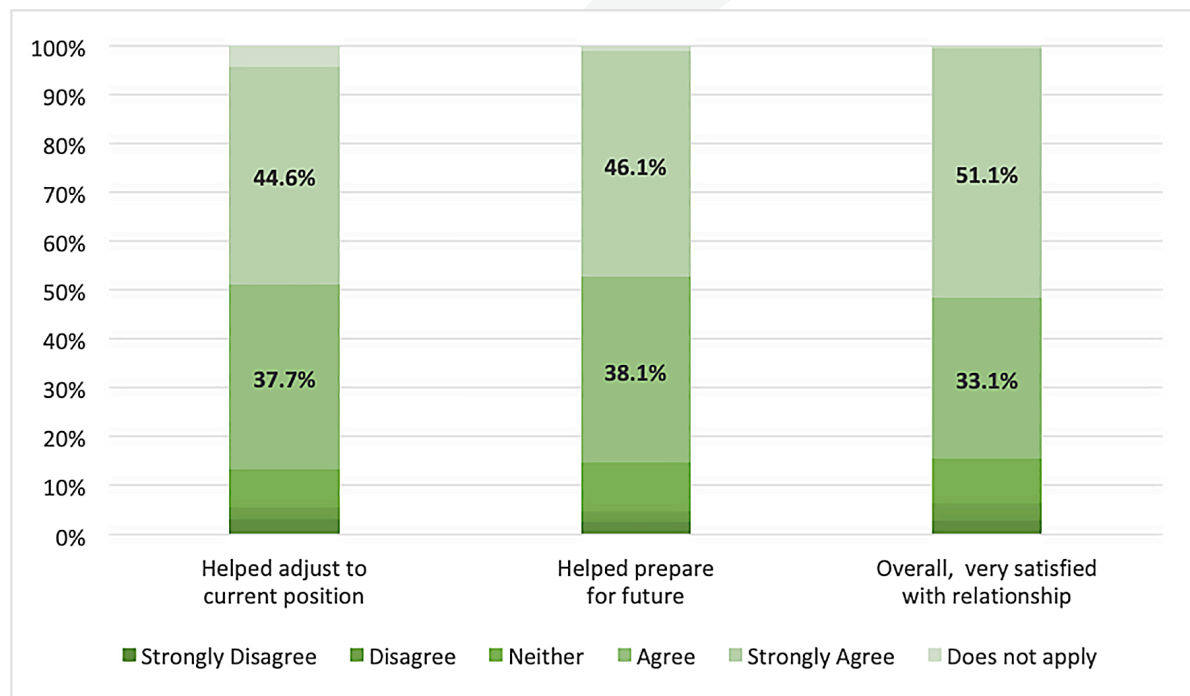
Respondents were also asked to describe how often they met with their mentor or advisor over the past 12 months. 1,056 respondents provided an answer to this question. The responses are indicated in the table below.

Table 12: Frequency of Interaction with Mentor or Advisor		
	N	Percentage
Not at all	6	0.6%
Once or twice	102	9.7%
Every few months	168	15.9%
Once a month	249	23.6%
Once a week	285	27.0%
More than once a week	246	23.3%

### Mentoring Quality

Respondents reported the quality of the mentorship they received by indicating the extent to which they agreed that their mentor helped them adjust to their current position and prepare them for their future as well as their overall satisfaction with their relationship with their mentor. Over 80% of respondents agreed or strongly agreed with each of the items related to mentoring quality (Figure 16).

Figure 15: Overall Mentoring Quality



## Discrimination and Sexual Harassment

Survey respondents indicated if they had experienced specific forms of discrimination within their workplace or training program. Of the 3,123 respondents that answered the discrimination questions 1,214 (38.9%) indicated that they experienced some sort of discrimination. Respondents to select from a list of specific forms of discrimination and were asked to select all experiences that applied. The breakdown is as follows:

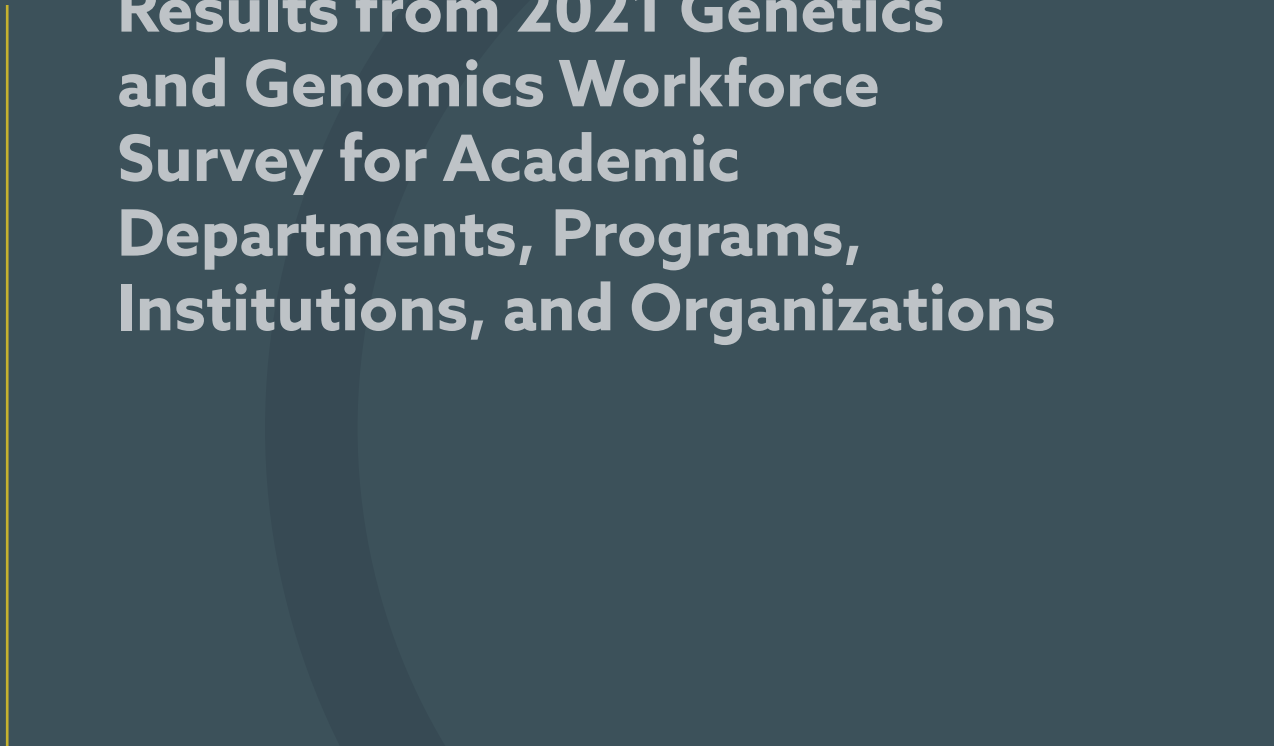
- 3% selected five different forms of discrimination
- 5.8% selected four different forms of discrimination
- 15.4% selected three different forms of discrimination

- 29.1% selected two different forms of discrimination
- 45.1% selected one form of discrimination

Survey respondents were also asked to describe their experiences with sexual harassment allowed to select all situations that applied. In the past five years, 108 respondents (3.3%) had experienced sexual harassment in their workplace or institution. Additionally, 97 respondents (2.9%) witnessed sexual harassment happening to someone else and 342 respondents (10.3%) heard about it happening to someone else. Moreover, respondents were asked how comfortable they felt reporting sexual harassment and how comfortable they would feel reporting sexual harassment at their current institution or workplace.



# 4



## Results from 2021 Genetics and Genomics Workforce Survey for Academic Departments, Programs, Institutions, and Organizations

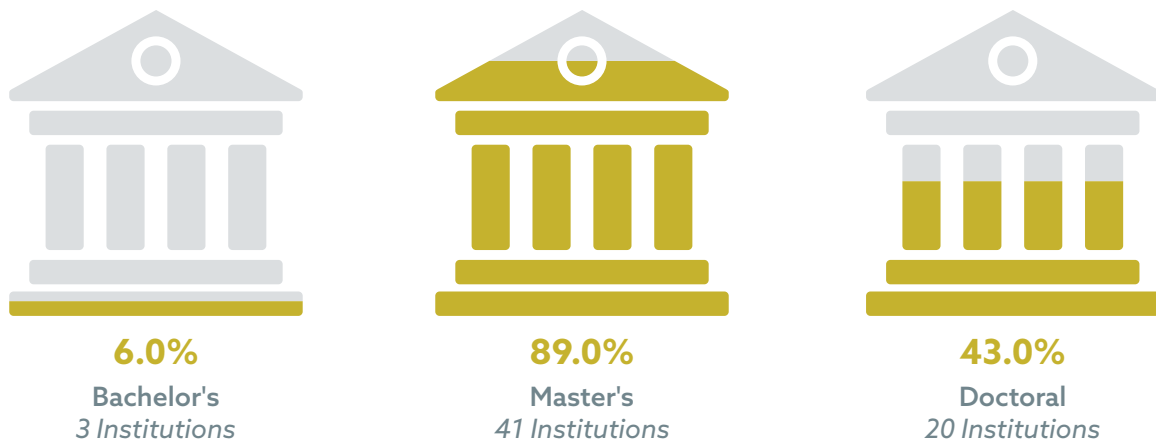
## ACADEMIC DEPARTMENTS AND PROGRAMS

The 2021 Genetics and Genomics Institutional Workforce Survey was sent to 116 academic departments and programs that offered a bachelor's, master's, or doctoral degree in genetics or genomics. Of the 116 academic departments, 46 departments and programs responded (40% response rate). Academic departments and programs were located at four-year universities and colleges, graduate institutes, and medical schools. The survey

was emailed to the chair or director of the department or program, and was completed by the chair, the director, or an administrator.

All 45 departments and programs that provided their degree status offered a master's or doctoral degree in genetics or genomics, with most offering a master's degree. Very few departments and programs offered a bachelor's degree (**Figure 16**).

**Figure 16: Type of Degree Offered by Genetics and Genomics Departments and Programs, 2021**



*Note. 45 out of 46 institutions responded to this survey item. Departments and programs could select multiple degree options, so numbers do not add up to 100%.*

Of the 116 academic departments and programs that received the survey, 19 academic institutions (41%) reported that they currently employ postdocs (**Table 13**).

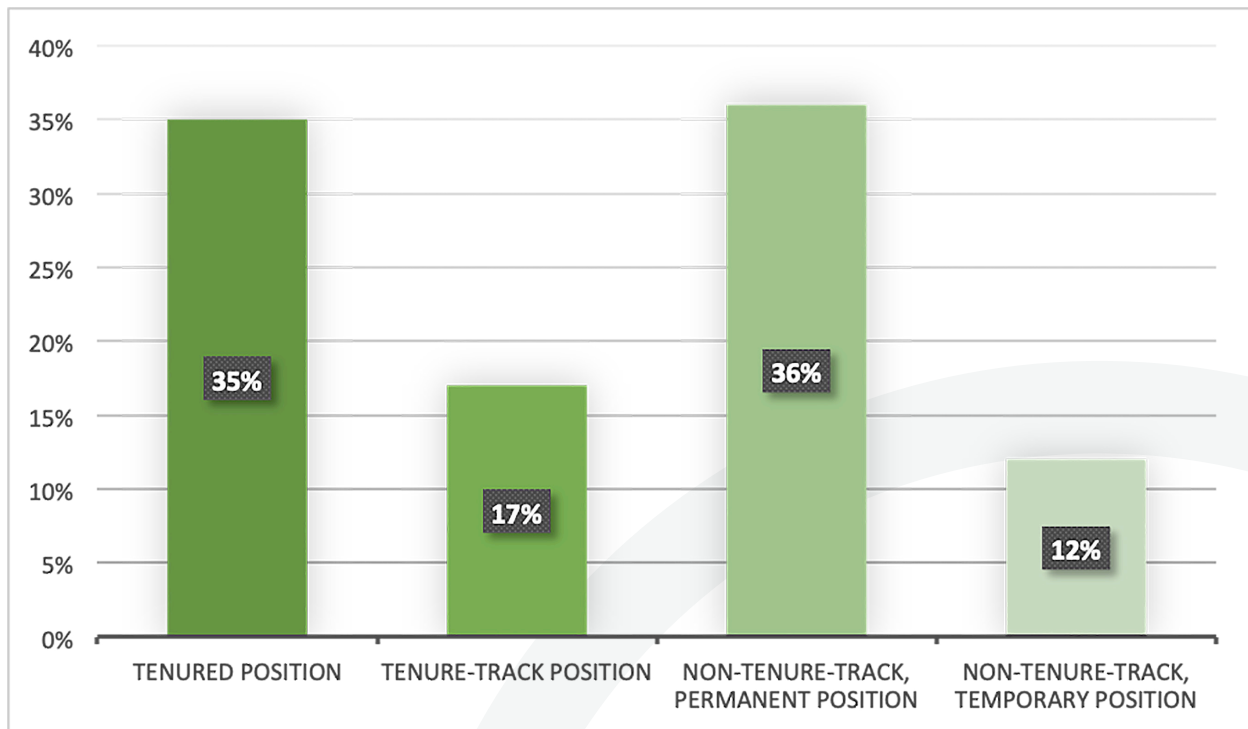
**Table 13: Number of Faculty Members, Postdocs, and Students at Genetics and Genomics Departments and Programs, 2021**

Position	Total Number	Number of Institutions
Faculty members	1,301	46
Postdocs	434	19
Undergraduate majors declared	1,030	3
Graduate students enrolled	1,227	45

About one-third of genetics and genomics faculty members were tenured, and another third held non-tenured permanent positions. A small percentage were employed in temporary

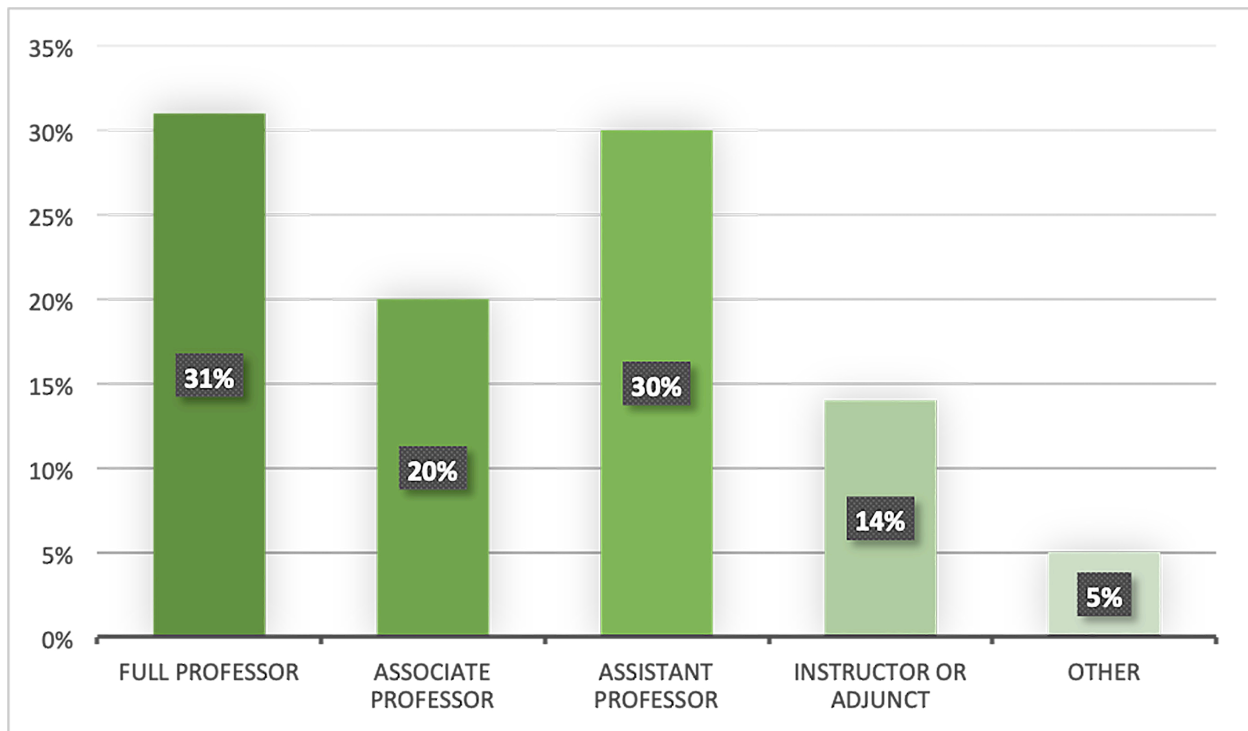
positions. This demonstrates that most faculty members in genetics and genomics were employed in more stable job positions (**Figure 17**).

**Figure 17: Tenure Status of Faculty Members at Genetics and Genomics Departments and Programs, 2021**



About one-third of faculty members were full professors, and about another third were assistant professors. A small percentage of faculty members were instructors or adjuncts (**Figure 18**).



**Figure 18: Rank of Faculty Members at Genetics and Genomics Departments and Programs, 2021**

Note. 44 out of 46 institutions responded to this survey item.

## Demographics

All demographic information was provided by a third party (the department chair, program director, or an administrator) and faculty members did not self-identify. The demographics reported here may differ from what an individual would answer in a survey.

Not all departments and programs were able to report demographic information, possibly due to a lack of access to the information or policy restrictions. One-third were unable to report information on citizenship. Most were able to report on faculty members' gender identity and race or ethnicity (**Table 14**).

**Table 14: Percent of Genetics and Genomics Departments and Programs Unable to Report Demographics, 2021**

Demographic Category	Number of Institutions	Percent of Institutions
Citizenship	15	33%
Gender Identity	3	7%
Race or ethnicity	7	15%

Note. All 46 institutions responded to these survey items.

For the departments and programs that could report citizenship information, almost all faculty members were U.S. citizens (94%) (Table 15).

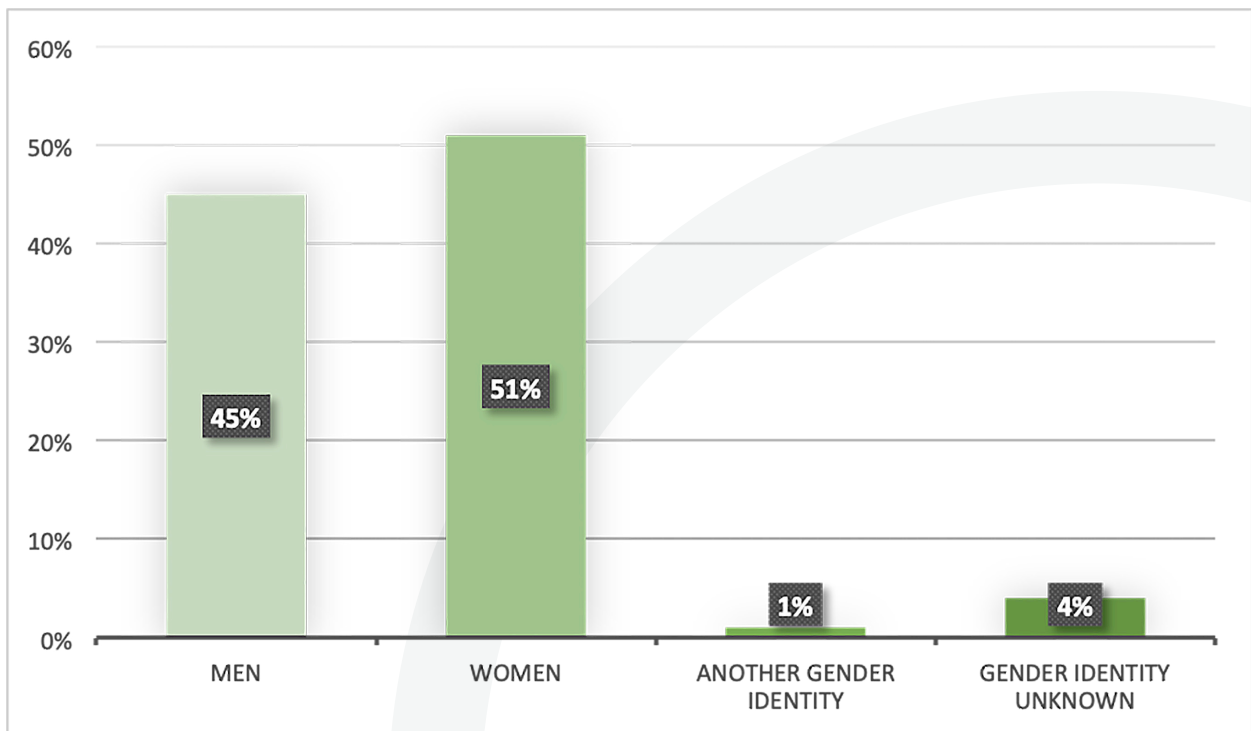
**Table 15: Citizenship Status of Faculty Members at Genetics and Genomics Departments and Programs, 2021**

Location of Citizenship	Percent
U.S. citizens	94%
Non-U.S. citizens	6%

Note. 30 out of 46 institutions responded to this survey item.

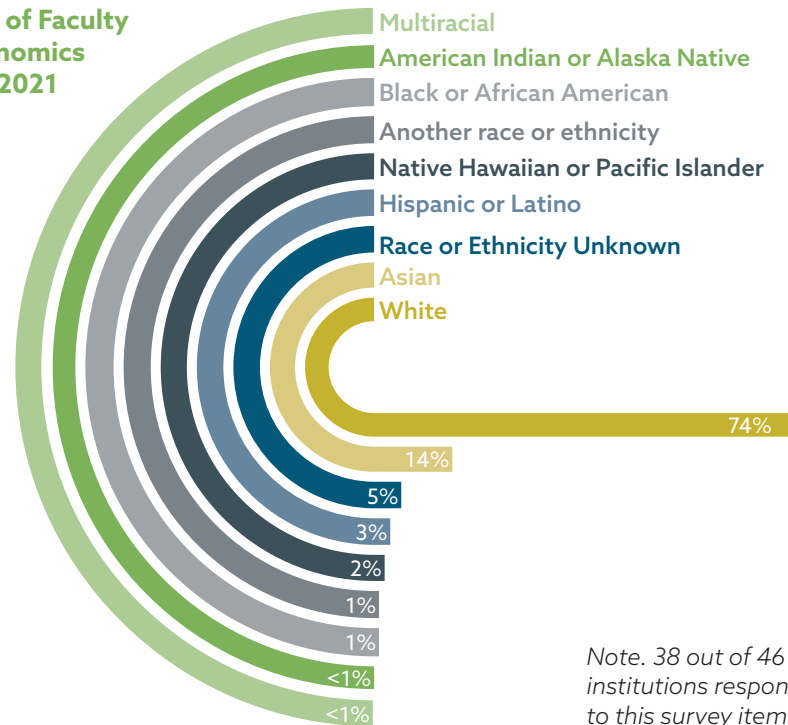
Women (51%) were slightly more represented among faculty members (Figure 19).

**Figure 19: Gender Identity of Faculty Members at Genetics and Genomics Departments and Programs, 2021**



Most faculty members were identified as White (74%) or Asian (14%) (Figure 20).

**Figure 20: Race and Ethnicity of Faculty Members at Genetics and Genomics Departments and Programs, 2021**



Note. 38 out of 46 institutions responded to this survey item.

## Industry Organizations

The 2021 Genetics and Genomics Institutional Workforce Survey was sent to 110 organizations in industry. 16 organizations responded (15% response rate). The definition for a genetics or genomics organization was broad and could include any organization whose mission focused on genetics or genomics. Organizations were in the for-profit, nonprofit, and government sectors, and provided genetics and genomics services in product development, pharmaceuticals, gene therapy, data analysis, research, genetic testing, and genetic counseling. The survey was completed by executive leaders at the organizations (presidents, directors, vice presidents, and chiefs).

Due to the small amount of responding industry organizations (16), *the results reported in this section may not accurately represent all industry organizations in genetics and genomics.* Generalizations and broad interpretations of these results should be done with caution.

Only 14 of the 16 organizations provided the total number of employees. Eight organizations (50%) offered trainee positions (including postdocs, fellows, and interns), but 1 did not have any trainees at the time (**Table 16**).

**Table 16: Number of Employees, Postdocs, Fellows, and Interns at Genetics and Genomics Organizations, 2021**

Position	Total Number	Number of Organizations
Employees	747	14
Postdocs	4	3
Fellows	1	1
Interns	7	3

## Demographics

All demographic information was provided by a third party, and employees did not self-identify. The demographics reported here may differ from what an individual would answer in a survey. About one-third of organizations were unable to report demographic information for employees, possibly due to lack of access to the information or policy restrictions (**Table 17**).

**Table 17: Percent of Genetics and Genomics Organizations Unable to Report Demographics, 2021**

Demographic Category	Number of Institutions	Percent of Institutions
Citizenship	5	31%
Gender identity	6	38%
Race or ethnicity	6	38%

Note. All 16 institutions responded to these survey items.

For organizations that could provide demographic information, most employees were U.S. citizens. In the industry survey results, there was a greater percentage of non-citizens (14%) compared to the academic survey results (6%) (Table 18). Any differences between academic and industry institutions in the survey results may not generalize to all academic and industry institutions in genetics and genomics, since only a small number of industry institutions responded.

**Table 18: Citizenship Status of Employees at Genetics and Genomics Organizations, 2021**

Location of Citizenship	Percent
U.S. citizens	86%
Non-U.S. citizens	14%

Note. 10 out of 16 institutions responded to this survey item.

The large majority of employees were identified as women (75%), which is a greater percentage of women compared to the academic survey results (51%) (Table 19).

**Table 19: Gender Identity of Employees at Genetics and Genomics Organizations, 2021**

Gender Identity	Percent
Men	24%
Women	75%
Another gender identity	<1%
Gender identity unknown	0%

Note. 9 out of 16 institutions responded to this survey item.

The majority of employees were identified as White (79%) and Asian (9%). This is similar to the percentage of those who were identified as White (74%) and Asian (14%) in the academic survey results (Table 20).

**Table 20: Race or Ethnicity of Employees at Genetics and Genomics Organizations, 2021**

	N	Percent
American Indian or Alaska Native	0	0%
Asian	23	9%
Black or African American	13	5%
Hispanic or Latino	14	5%
Native Hawaiian or Pacific Islander	0	0%
White	211	79%
Another race or ethnicity	0	0%
Multiracial	5	2%
Race or ethnicity unknown	1	<1%

Note. 9 out of 16 institutions responded to this survey item.





# 5

## INTERVIEWS AND FOCUS GROUPS



## KEY FINDINGS

### 01 DE&I Training

The existence of one-off training is insufficient to eliminate or mitigate experiences of racial prejudice or discrimination.

### 02 Rewards Systems

Rewards and recognition programs can go a long way in making employees feel like they belong and are valued.

### 03 Inclusion & Exclusion

Students and employees are looking for tangible signs that organizations have an inclusive culture, including visible representation.

### 04 Data Transparency, Metrics, & Accountability

Transparency about employee and student identity demographics, and individual/organizational competency metrics, are uncommon across all respondent types.

### 05 Discrimination & Microaggression

While most do not report frequent awareness of overt discrimination, covert and implicit microaggressions based on race, gender, and disability are frequently experienced.

### 06 Complaints & Reporting

Formal systems for reporting discriminatory practices are not widely known or understood in academic settings.

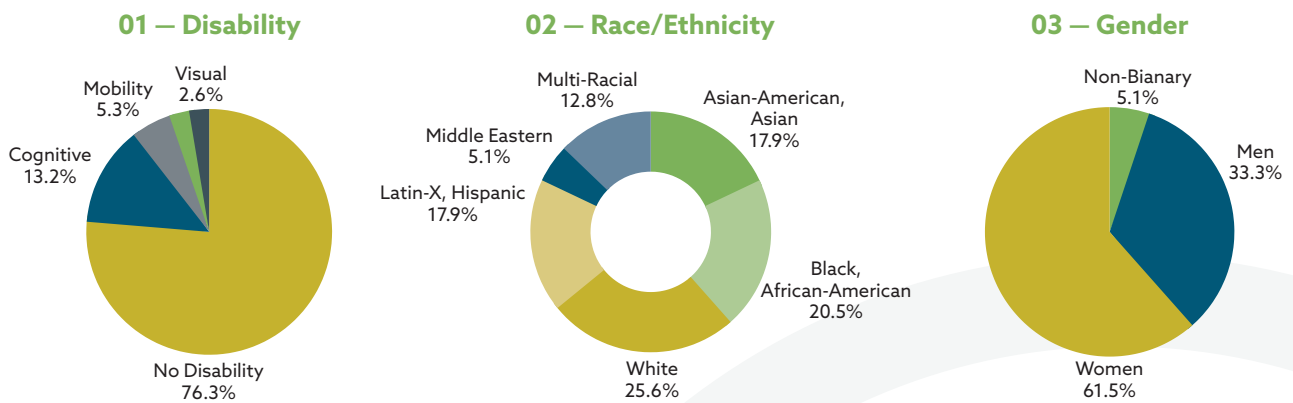
## Professional Affiliations

- While awareness and engagement in larger, older, professional societies and associations is common, respondents suggest membership can be an obligation with their sense of belonging in these professional environments lagging compared to other professional communities.
- Reliance on free online communities as professional networks is an increasing trend, especially among students and early career professionals.
- Foreign-born members of the profession report a significantly higher rate of negative experiences with exclusion and discrimination at professional events and academic settings in the U.S.

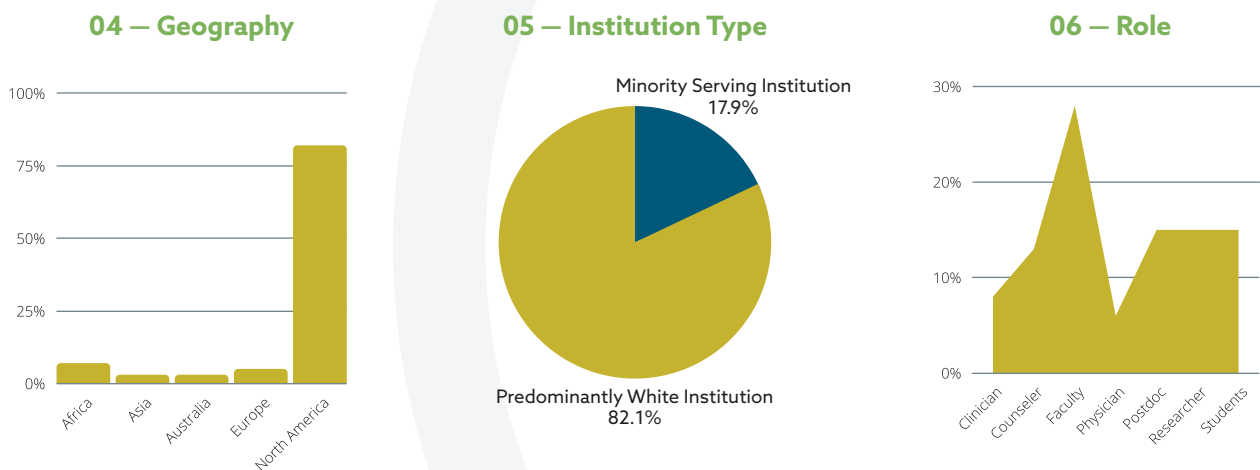


# PARTICIPANT DEMOGRAPHICS

Of the 40 participants across all interview and focus groups, approximately 21% were people with one or more disabilities. The majority of participants, 74%, did not identify as white. Respondents skewed female (61%) with 33% identifying as men. Individuals who are non-binary (5%) participated at a significantly higher rate than the initial individual survey in which less than 1% were similarly identified.

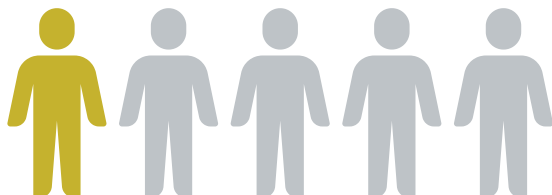


Of the 40 participants across all interview and focus groups, the majority reside in North America, including 80% who live in the United States. Nearly 18% worked in minority serving institutions, including HBCUs, AAPI-serving, and Hispanic or Latinx-serving institutions.

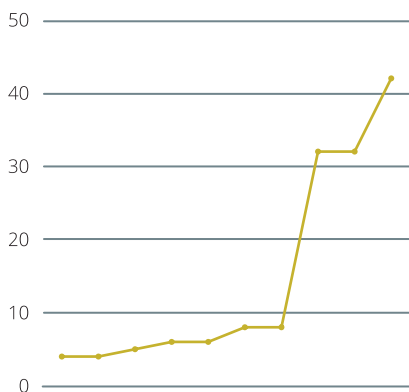


Of all early career respondents working full-time, 20% identify as part of the LGBTQ+ community. The majority of women participating (70%) had less than 10 years of professional experience, and 50% of these women experienced disruptions in their careers (employment type, level, or status) in the 18 months prior as a result of COVID-19 pandemic.

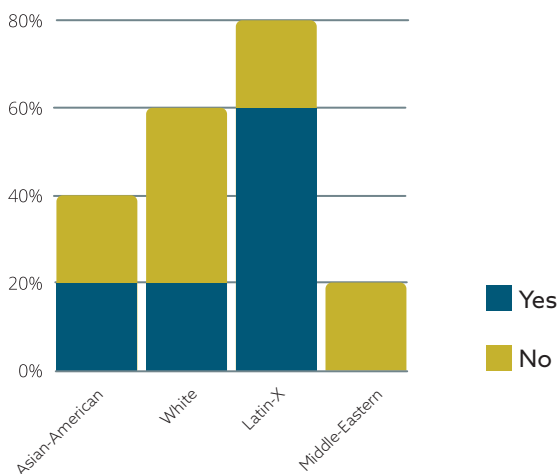
**Early Career** 07 – LGBTQ



**Women** 08 – Years of Experience



**Women** 09 – Career Affected by COVID



## DISCUSSION RESULTS

### Diversity, Equity, and Inclusion Training

**The existence of one-off DE&I related training is insufficient to mitigate or eliminate experiences of racial prejudice and discrimination.**

- While 100% of respondents said their current place of work or study provides occasional education and/or training in skills related to diversity, equity and inclusion, nearly all have experienced or observed racial discrimination or prejudice at least once per year.
- No respondents were aware of accountability metrics or performance indicators being used as part of performance reviews and management for faculty.

**100%**  
DE&I Education

**0%**  
Accountability  
Metrics

### Reward Systems

**Rewards and recognition programs can go a long way in making employees feel like they belong and are valued.**

- An overwhelming majority of respondents, whether a student or faculty member, believe grading is equitable in their institutions.
- While some believe pay is equitable in their organizations, more than half suspect it isn't but do not have data or examples to substantiate their beliefs.
- The majority of respondents, regardless of career stage, report that hiring is not equitable in the genetics and genomics industry and believe hiring is biased.
- Respondents suggested that they are more often treated "by-the-book" while their majority counterparts benefit from unwritten flexibility and lenience.

### Inclusion and Exclusion

**Students and employees are looking for tangible signs that organizations have an inclusive culture, including visible representation.**

- Lack of leadership vision and support for equity, inclusion, and accountability is very hard/rare to overcome.
- Unwillingness to change existing practices and traditions is common.
- Inadequate self-awareness of bias by those in power is common.
- Access to informal mentoring relationships and informal advancement opportunities (events, committees, etc.) that occur through proximity, trust and shared interests is reported as rare, yet essential.

## Data Transparency

**Transparency about employee and student identity related demographics is uncommon across all respondent types.**

Most respondents were unaware of where to find publicly accessible data that was disaggregated by race or ethnicity, and were not confident it existed anywhere.

**80%**  
**Without Access**

## Discrimination & Microaggression

**While most do not report frequent awareness of overt discrimination, covert and implicit microaggressions based on race, gender, and disability are frequently experienced.**

- Program and department chairs report instances of discrimination are personally experienced or observed a few times every year.
- About half of respondents report experiencing and observing microaggressions on a daily basis.
- Women were twice as likely to be in this group.
- Faculty reported suspected instances of discrimination against students within the academic setting which students were reluctant to corroborate, and within the job market particularly among students with less Eurocentric names.

## Complaints and Reporting

**Formal systems for reporting discriminatory practices are not widely known or understood in academic settings.**

- There was general agreement by all respondents that instances of obvious discrimination and identity-based passive aggression frequently go unreported and the aggressors aren't made accountable when they are.
- The importance of safe spaces for people who are non-white to report discriminatory actions was emphasized by several respondents, including the value (and necessity) of anonymous systems to do so.
- All faculty reported the presence of a DE&I leader on staff, typically at the university level reporting to the president.
- Some also report additional DE&I focused leaders at the college/department level.

## CONCLUSION

Despite small gains in recent years, the genetics and genomics workforce lacks diversity. It does not reflect the make-up of students entering the workforce pipeline, nor the domestic and global populations it serves. The result reduces productivity, negatively skews research programs and outcomes, and falls short of realizing the business case or the justice case for diversity. To advance and ensure workforce diversity in genetics and genomics professions, associations, academic institutions, and corporate employers must collaboratively dismantle structural and cultural barriers unique to the industry.

### **Cross Industry Collaboration**

Adopt racial equity goals related to post secondary training policies, career pathways and credentials, job-driven and need-based financial aid, tuition and pay equity, and inclusion for immigrants; develop interrelated plans and systems to support them.

### **Recruitment, Hiring, and Promotion Policies**

Remove core structural barriers tied to financial equity, job access, preparation for job opportunities and barriers inherent in recruiting, hiring, and promotion practices.

### **Data Transparency, Benchmarking, and Recognition**

Invest in infrastructure that helps academic and corporate organizations identify, publicly share, and advance goals; incentivize impact and process.





# 6

## Conclusion





## CONCLUSION

The genetics and genomics workforce is insufficiently diverse, lacking equitable participation of underrepresented communities based on race and ethnicity, gender, disability, and economic background. With greater diversity, equity and inclusion, genetics and genomics would benefit from wider perspectives and experiences and increased competency to engage diverse communities in research. The impact of this underrepresentation is critical to understand, given the imminent transition toward a non-White majority in the United States.





# 7

## Appendices



## APPENDIX A: REFERENCES

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# 8



## 2021 Workforce Survey for Individuals in Human Genetics and Genomics



## DEMOGRAPHICS, TRAINING, AND CAREER SECTION

In this first section, you will be asked questions pertaining to your current, primary position in the field of genetics and genomics.

**1. Which of the following best describes your current, primary position in the field of genetics and genomics?**

- Enrolled as a graduate student
- Enrolled as a medical student
- Enrolled or employed in a temporary training program – *for example, postdoc, postbac, fellowship, residency*
- Employed in an other temporary position (has a specific ending date)
- Employed in a permanent or potentially permanent position (no specified ending date)
- I am not currently enrolled or employed in the field of genetics and genomics
- Other – *Please specify:* \_\_\_\_\_

**2. Have you ever studied, trained, or been employed in the field of genetics and genomics?**

- Yes
- No

**3. Which of the following best describes your current training program? *Please check all that apply.***

- Postbaccalaureate program
- Postdoctoral appointment
- Clinical fellowship
- Research fellowship
- Residency
- Other training program  
*Please specify:* \_\_\_\_\_

**4. When did you start your current program or training?**

Year: \_\_\_\_\_

**5. Where is your current program or training located?**

- In the US
- Outside the US

**6. Which of the following best describes the area of work you plan to pursue or are interested in pursuing? *Please check all that apply.***

- Administrative
- Academic
- Bioinformatics or Information Technology
- Clinical, Medical, or Nursing



- Genetic Counseling
- Industry
- Laboratory
- Management
- Nonprofit
- Pharmaceuticals
- Policy
- Public Health
- Research
- Scientific Communication – *for example, education, outreach, writing, editing*
- Other – *Please specify:* \_\_\_\_\_

**7. Which of the following best describes your primary employer?**

- Government hospital
- Government, non-hospital
- Industry or for-profit organization
- Medical school or university hospital
- College or university, non-medical
- Nonprofit
- Private or community hospital
- Self-employed consultant
- Retired
- Other – *Please specify:* \_\_\_\_\_

**8. Which of the following best describes your primary area of work? Please check all that apply.**

- Administrative
- Academic
- Bioinformatics or Information Technology
- Biotechnology or Pharmaceuticals
- Clinical, Medical, or Nursing
- Genetic Counseling
- Laboratory
- Management
- Policy
- Public Health
- Research
- Scientific Communication – *for example, education, outreach, writing, editing*
- Other – *Please specify:* \_\_\_\_\_

**9. What is your primary specialty or interest?**

- I do not have a primary specialty or interest
- Bioinformatics or Computational Approaches
- Biotechnology or Pharmaceutical
- Cancer Genetics
- Cardiovascular Diseases
- Clinical genetics or Genomics
- Complex Traits or Polygenic Disorders
- Education

- Epigenetics or Gene Regulation
- Ethical, Legal, and Social Issues
- Evolution or Population Genetics
- Genetic Counseling
- Health Services Research
- Maternal Fetal Medicine, Obstetrics, or Gynecology
- Mendelian Phenotypes
- Molecular Effects of Genetic Variation
- Molecular or Cytogenetics Diagnostics
- Molecular Phenotyping or Omics Technologies
- Neurogenetics
- Pediatrics
- Precision Medicine, Pharmacogenetics or Gene Therapies
- Prenatal, Perinatal, Reproductive, or Developmental Genetics
- Public Health Genetics
- Science Policy
- Statistical Genetics or Genetic Epidemiology
- Other

**10. Please specify your primary specialty or interest.**\_\_\_\_\_

**11. What is your secondary specialty or interest?**

- I do not have a secondary specialty or interest
- Bioinformatics or Computational Approaches
- Biotechnology or Pharmaceutical
- Cancer Genetics
- Cardiovascular Diseases
- Clinical genetics or Genomics
- Complex Traits or Polygenic Disorders
- Education
- Epigenetics or Gene Regulation
- Ethical, Legal, and Social Issues
- Evolution or Population Genetics
- Genetic Counseling
- Health Services Research
- Maternal Fetal Medicine, Obstetrics, or Gynecology
- Mendelian Phenotypes
- Molecular Effects of Genetic Variation
- Molecular or Cytogenetics Diagnostics
- Molecular Phenotyping or Omics Technologies
- Neurogenetics
- Pediatrics
- Precision Medicine, Pharmacogenetics or Gene Therapies

- Prenatal, Perinatal, Reproductive, or Developmental Genetics
- Public Health Genetics
- Science Policy
- Statistical Genetics or Genetic Epidemiology
- Other

**12. Please specify your secondary specialty or interest.** \_\_\_\_\_

***To support the success of the genetics and genomics workforce, it is important to know the demographics of the community. The demographic information being collected in this section will assist in efforts to improve our understanding of the workforce and help develop strategies to increase diversity within the genetics and genomics workforce.***

**13. In what year were you born?**

Year: \_\_\_\_\_

**14. What is your primary citizenship?**

- US citizen
- Non-US citizen, permanent resident status (Green Card holder)
- Non-US citizen, other temporary visa in the US
- Other non-US citizen  
If you are a non-US citizen, what is your primary country of citizenship?  
\_\_\_\_\_

**15.\* Which categories best describe you?**

***Please check all that apply.***

- American Indian or Alaska Native
- Asian
- Black, African American, or African
- Hispanic, Latino, or Spanish
- Middle Eastern or North African
- Native Hawaiian or other Pacific Islander
- White
- Other - Please specify: \_\_\_\_\_
- Prefer not to respond

*\*Note: This question was created based on the All of Us Research Program standards.*

**16. Do you have a disability?**

- Yes
- No
- Prefer not to respond

**17. Please indicate which of the following apply to you. Please check all that apply.**

- I am deaf or hard of hearing
- I have difficulty seeing even when wearing glasses
- I have serious difficulty standing, walking, or climbing stairs
- I have a cognitive or learning disability
- I have a mental illness
- I am neuroatypical

- I have an autoimmune or pain disorder, or other chronic condition
- I have disabling allergies, asthma, or other environmental sensitivities
- Other disability  
*Please specify:* \_\_\_\_\_
- Prefer not to respond

**18. Which of the following accessibility aids do you use? Please check all that apply.**

- Sign language, American or other
- Hearing aids, headphones, and other audio devices
- Closed captioning
- Screen readers
- Braille
- Speech transcription
- Mobility aids
- Note takers
- Quiet spaces
- Dietary accommodation related to health or disability
- Environmental adjustments – *for example, lighting, air, noise*
- Service animal
- Other accessibility aid  
*Please specify:* \_\_\_\_\_
- None of the above
- Prefer not to respond

**19. Have you requested accessibility accommodations at work or school? Please check all that apply.**

- Yes, and I received them
- Yes, but accommodations were not available
- Yes, but I was denied accommodations
- No, and I do not want or need accommodations
- No, but I would benefit from accommodation
- No, and I am afraid of disclosing my disability or chronic condition
- Not applicable
- Prefer not to respond

**20. What terms best express how you describe your gender identity? Please check all that apply.**

- Man
- Woman
- Non-binary
- Transgender
- None of these describe me, and I'd like to consider additional options
- Prefer not to respond

**21. Are any of these a closer description to your gender identity?**

- Trans man, Transgender Man, or FTM
- Trans woman, Transgender Woman, or MTF
- Genderqueer
- Genderfluid
- Gender variant
- Questioning or unsure of your gender identity
- None of these describe me, and I want to specify: \_\_\_\_\_
- Prefer not to respond

**22. Do you identify as LGBTQIA (Lesbian, Gay, Bi-Sexual, Transgender, Queer, Intersex, Asexual)?**

- Yes
- No
- Unsure
- Prefer not to respond

**23. What is your current marital status?**

- Married
- Divorced
- Widowed
- Separated
- Living with partner
- Single
- Prefer not to respond

**24. Do you have any children?**

*Include all children for whom you are or have been a parent or legal guardian, regardless of current age.*

- Yes
- No
- Prefer not to respond

**25. Do any of your children currently live in your home? Please check all that apply.**

- Yes, at least one child under 18 years old
- Yes, at least one child 18 years old or older
- No

**26. How old is your youngest child?**

- 0 to 5 years old
- 6 to 12 years old
- 13 to 17 years old
- 18+ years old

**27. Are you primarily responsible for the care of other relatives or dependents?**

- Yes
- No
- Prefer not to respond

**28. Please indicate which of the following apply to you. Please check all that apply.**

- Were or currently are homeless
- Were in the foster care system
- Were eligible for the Federal Free and Reduced Lunch Program for two or more years
- Have or had no parents or legal guardians who completed a bachelor's degree
- Were or currently are eligible for Federal Pell grants
- Received support from the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) as a parent or child
- Grew up in a US rural area
- Grew up in a designated low-income area
- None of the above
- Prefer not to respond

***The following questions are focused on your education and training. These questions will inform the landscape of professional preparation and progress in the genetics and genomics workforce.***

**29. What is your highest level of education? Please check all that apply.**

- Doctorate (PhD)
- Doctor of Education (EdD)
- Medical degree (MD, DO, DDS)
- Juris Doctor (JD)

- Master of Business Administration (MBA)
- Master's degree (non-MBA)
- Bachelor's degree
- Nursing degree
- Other – Please specify: \_\_\_\_\_

**30. Do you have any special certifications – for example, FACMG, CGC?**

- Yes – Please specify: \_\_\_\_\_
- No

**31. What is the primary field of your highest degree?**

- Biochemistry, Biophysics, or Molecular Biology
- Bioinformatics, Biotechnology, Biomathematics, or Computational Biology
- Biological or Biomedical Sciences
- Botany or Plant Biology
- Cell biology or Anatomical Sciences
- Developmental Biology
- Ecology, Evolution, or Systematics Biology
- Epigenetics
- Ethical, Legal, and Social Issues
- General Biology
- General Genetics
- Genetic Counseling
- Genomics or Genome Sciences
- Human or Medical Genetics

- Molecular Genetics
- Microbiological Sciences or Immunology
- Neurobiology or Neuroscience
- Physiology or Pathology Sciences
- Pharmacology or Toxicology
- Other - Please specify: \_\_\_\_\_
- 32. When did you receive your highest degree? Please enter four numerical values - for example, 2004.**  
Year: \_\_\_\_\_
- 33. In what country did you receive your highest degree?**
- In the US
- Outside the US
- 34. Is there anything else you would like us to know about your employment status or training in the field of genetics and genomics? \_\_\_\_\_**
- 35. Where are you currently employed?**
- In the US
- Outside the US
- 36. When did you start working at your current workplace? Please enter four numerical values - for example, 2004.**  
Year: \_\_\_\_\_
- 37. Were you previously employed at a different workplace or institution within the field of genetics or genomics?**
- Yes
- No
- 38. When did you begin your first position in the field of genetics or genomics? Please do not count employment that was part of an education or training program.**  
Year: \_\_\_\_\_
- 39. Have you ever received a promotion in the field of genetics or genomics? Please check all that apply.**
- Yes, at a previous workplace
- Yes, when I accepted the position at my current workplace
- Yes, within my current workplace
- No
- 40. Have you received a promotion at your current workplace?**
- Yes
- No
- 41. How many times have you been promoted?**  
\_\_\_\_\_

42. When was your most recent promotion?

Please enter four numerical values - for example, 2004.

Year: \_\_\_\_\_

3 years

4 years

5 years

6 years

7 years

8 years

9 years

10 or more years

43. Have you ever completed a training program or held an appointment focused on training, for example, postdoc, postbac, fellowship, residency? Please do not include any training you received as part of your formal education.

Yes

No

46. Do you currently have a mentor?

(ONLY completed by temp or perm employed)

Yes

No

44. Which of the following training programs or appointments have you completed?

Please check all that apply.

Postbaccalaureate program

Postdoctoral appointment

Clinical fellowship

Research fellowship

Residency

Other training program

Please specify: \_\_\_\_\_

47. Do you currently have a mentor or advisor?

(ONLY completed by students and trainees)

Yes

No skip to Q52

45. Approximately how long was your training program or appointment.

If you completed more than one training program, please add the time together?

Less than 1 year

1 year

2 years

48. Which of the following describes your primary mentor or advisor?

A mentor from my area or department formally assigned to mentor me

A mentor from my area or department whom I asked to mentor me

A mentor from another area or department formally assigned to mentor me

A mentor from another area or department whom I asked to mentor me

Other



49. Please describe your relationship with your primary mentor or advisor? For example, how did you get paired together?

---

50. Over the past 12 months, how often have you interacted with your primary mentor or advisor?

- Not at all
- Once or twice
- Every few months
- About once a month
- About once a week
- More often than once a week

51. To what extent do you agree or disagree with the following statements based on your experience with your primary mentor or advisor?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Does not apply
My mentor has helped me adjust to my current position.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My mentor has helped me prepare for my future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, I am very satisfied with my relationship with my mentor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>





54. To what extent do you agree or disagree with the following statements based on your experience at your current workplace or institution within the past five years?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Does not apply
I have personally experienced or witnessed indirect, subtle, or unintentional discrimination within my workplace.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have personally experienced or witnessed intimidating, offensive, and/or hostile behavior within my workplace.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

55. To what extent do you agree or disagree with the following statements based on your experience at your current workplace or institution within the past five years?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Does not apply
Overall, I am very satisfied with my current job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would strongly recommend working in a job like mine to a friend.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had to decide again whether to take my current job, I would take it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My job measures up to the sort of job I wanted when I took it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

56. Do you receive financial compensation from your current, primary position in the field of genetics and genomics?

- Yes, I am paid an hourly rate
- Yes, I receive a salary
- No, I do not receive any financial compensation
- Prefer not to respond

57. What is your base hourly rate at your current workplace or institution?

*Please do not include bonuses, overtime, or additional compensation.*

\$ \_\_\_\_\_

- Prefer not to respond

**58. What is your base salary at your current workplace or institution?**

*Please do not include bonuses, overtime, or additional compensation.*

\$ \_\_\_\_\_

Prefer not to respond

**59. If you feel more comfortable, please provide the range of your base salary at your current workplace or institution?**

*Please do not include bonuses, overtime, or additional compensation.*

Less than \$40,000

\$40,000 - \$49,999

\$50,000 - \$59,999

\$60,000 - \$69,999

\$70,000 - \$79,999

\$80,000 - \$89,999

\$90,000 - \$99,999

\$100,000 - \$109,999

\$110,000 - \$119,999

\$120,000 - \$129,999

\$130,000 - \$139,999

\$140,000 - \$149,999

\$150,000 - \$159,999

\$160,000 - \$169,999

\$170,000 - \$179,999

\$180,000 - \$189,999

\$190,000 - \$199,999

\$200,000 - \$209,999

\$210,000 - \$219,999

\$220,000 - \$229,999

\$230,000 - \$239,999

\$240,000 - \$249,999

\$250,000 or greater

Prefer not to respond

**60. Over how many months is your salary paid?**

Months: \_\_\_\_\_



63. To what extent do you agree or disagree with the following statements based on your experience in your current program or department?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Does not apply
I have personally experienced or witnessed indirect, subtle, or unintentional discrimination within my program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have personally experienced or witnessed intimidating, offensive, and/or hostile behavior within my program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

64. To what extent do you agree or disagree with the following statements based on your experience in your current program or department?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Does not apply
Overall, I am very satisfied with my current program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would strongly recommend a program like mine to a friend.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had to decide again whether to begin my program, I would.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My program measures up to the sort of program I wanted when I started it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

65. Do you receive a salary or financial compensation as part of your program? *Please do not include any financial reimbursements, scholarships, or tuition waivers for attending your program.*

- Yes  
 No

66. What is your base compensation at your program? *Please do not include bonuses, overtime, or additional compensation.*

\$ \_\_\_\_\_

- Prefer not to respond

**67. If you feel more comfortable, please provide the range of your base compensation at your program? *Please do not include bonuses, overtime, or additional compensation.***

- Less than \$10,000
- \$10,000 - \$19,999
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- \$40,000 - \$49,999
- \$50,000 - \$59,999
- \$60,000 - \$69,999
- \$70,000 - \$79,999
- \$80,000 or greater
- Prefer not to respond

**68. Over how many months is your salary paid?**

Months: \_\_\_\_\_

**69. Do you receive any financial reimbursements, scholarships, or tuition waivers from your program for attending?**

- Yes
- No

## WORKPLACE CLIMATE

*This section focuses on the climate within your current workplace or training program. Responses to these questions about your personal experiences will assist in efforts to understand the current workforce and make any improvements.*

**70. Within your workplace or institution, have you felt discriminated against based on any of the following? Please check all that apply.**

- Gender
- Age
- Race or ethnicity
- Sexual orientation
- Country of origin
- Disability
- Religion
- Marital status
- Socioeconomic status
- Pregnancy, childcare responsibilities, or other caretaking responsibilities
- Level of education – for example, master's degree vs. doctorate
- Type of degree – for example, medical degree vs. doctorate
- Political views
- Other – Please specify: \_\_\_\_\_
- I have not felt discriminated against

**71. Within the past five years, have you encountered sexual harassment at your workplace or institution?**

*Please check all that apply.*

- Yes, it happened to me
- Yes, I witnessed it happening to someone else
- Yes, I heard about it happening to someone else
- No

**72. How comfortable did you feel reporting the sexual harassment incidents at your workplace or institution?**

- Very uncomfortable
- Uncomfortable
- Neither comfortable or uncomfortable
- Comfortable
- Very comfortable
- Prefer not to respond



**73. How comfortable would you feel reporting sexual harassment incidents at your workplace or institution if you were to encounter it in the future?**

- Very uncomfortable
- Uncomfortable
- Neither comfortable or uncomfortable
- Comfortable
- Very comfortable
- Prefer not to respond

**74. Please use the space below for any additional thoughts, feedback, or recommendations regarding workplace or program climate. \_\_\_\_\_**



## 2021 GENETICS AND GENOMICS WORKFORCE SURVEY FOR ACADEMIC DEPARTMENTS AND PROGRAMS

1. **As of March 2021, please indicate the total number (in headcount) of faculty members who teach or do research in your department or program, not including postdocs or graduate students:**
2. **As of March 2021, how many of the faculty members in your department or program were:**
  - Full professors
  - Associate professors
  - Assistant professors
  - Instructors or adjuncts
  - Other
3. **As of March 2021, how many of the faculty members in your department or program were:**
  - Tenured
  - Tenure-track, but not yet tenured
  - Non-tenure-track, permanent
  - Non-tenure-track, temporary
4. **As of March 2021, how many faculty members in your department or program were:**
  - US citizens
  - Non-US citizens
  - We are unable to provide citizenship information.
5. **As of March 2021, how many faculty members in your department or program were:**
  - Men
  - Women
  - Another gender identity (e.g., transgender, non-binary, gender fluid, agender)
  - Gender identity unknown
  - We are unable to provide gender identity information.
6. **As of March 2021, how many faculty members in your department or program were:**
  - Hispanic or Latino
  - American Indian or Alaska Native Asian
  - Black or African American
  - Native Hawaiian or Pacific Islander White
  - Another race or ethnicity
  - Two or more races or ethnicities Race or ethnicity unknown
  - We are unable to provide race or ethnicity information.
7. **As of March 2021, how many people in postdoctoral positions are working in your department or program? A postdoctoral appointment or 'postdoc' is a temporary position with a defined period of mentored training in research for the purpose of acquiring professional skills and research independence.**

8. Which degrees are offered by your department or program?  
(please check all that apply)
- Bachelor's
  - Master's
  - Doctorate
9. At the start of the Fall 2020 semester, how many undergraduate students declared a major in your department or program?
10. At the start of the Fall 2020 semester, how many graduate students (Master's or doctoral) were enrolled in your graduate program(s)?
11. Does your department or program have a department-level committee(s) on diversity, equity, or inclusion?
- Yes
  - No
- 11a. Please describe the scope of the diversity, equity, or inclusion committee(s) work:
12. Does your department or program participate in diversity and inclusion events, programs, conferences, or workshops?
- Yes
  - No
- 12a. Please describe the diversity and inclusion events, programs, conferences, and workshops that your department or program participates in:
13. Please indicate if your department or program incorporates the following topics in your curriculum or training:  
(please check all that apply)
- Increasing the voluntary participation of underrepresented race and ethnicity group members in research studies
  - Increasing the voluntary participation of LGBTQ+ individuals in research studies
  - Increasing the representation of underrepresented race and ethnicity group members in the research workforce
  - Increasing the representation of women in the research workforce
  - Increasing the representation of LGBTQ+ individuals in the research workforce
  - Discussing the distinction between the meaning of race and ancestry in research
  - Providing cultural proficiency and sensitivity training for working with research participants
14. Does your department or program have mentorship programs or opportunities for new hires or individuals interested in leadership?
- Yes
  - No
- 14a. Please describe what mentorship programs or opportunities your department or program provides:

## 2021 GENETICS AND GENOMICS WORKFORCE SURVEY FOR INSTITUTIONS AND ORGANIZATIONS

1. **As of March 2021, please indicate the total number (in headcount) of employees at your organization or division:**
  - Another race or ethnicity
  - Two or more races or ethnicities Race or ethnicity unknown
  - We are unable to provide race or ethnicity information.
2. **As of March 2021, how many of your employees were:**
  - US Citizens
  - Non-US Citizens
  - We are unable to provide citizenship information.
3. **As of March 2021, how many of your employees were:**
  - Men
  - Women
  - Another gender identity (e.g., transgender, non-binary, gender fluid, agender)
  - Gender identity unknown
  - We are unable to provide gender identify information.
4. **As of March 2021, how many of your employees were:**
  - Hispanic or Latino
  - American Indian or Alaska Native Asian
  - Black or African American
  - Native Hawaiian or Pacific Islander White
5. **Does your organization offer postdoctoral, fellowship, or internship positions? A postdoctoral appointment or 'postdoc' is a temporary position with a defined period of mentored training in research for the purpose of acquiring professional skills and research independence.**
  - Yes
  - No
- 5a. **As of February 2021, how many people in postdoctoral positions were working at your organization or division?**
- 5b. **As of February 2021, how many people in fellowship positions were working at your organization or division?**
- 5c. **As of February 2021, how many people in internship positions were working at your organization or division?**

6. Does your organization have a committee or department on diversity, equity, or inclusion?

Yes

No

6a. Please describe the scope of the diversity, equity, or inclusion work done by your committee or department:

7. Does your organization participate in diversity and inclusion events, programs, conferences, or workshops?

Yes

No

7a. Please describe the diversity and inclusion events, programs, conferences, and workshops that your organization participates in:

8. Does your organization have mentorship programs or opportunities for new hires or individuals interested in leadership?

Yes

No

8a. Please describe what mentorship programs or opportunities your organization provides:







# 9



## Interviews & Focus Groups



## INTERVIEWS & FOCUS GROUPS

### Background Info

#### [For Reference Only – Not Shared Verbally]

The American Society of Human Genetics (ASHG), in partnership with the American College of Medical Genetics and Genomics (ACMG), and the National Society of Genetic Counselors (NSGC), is conducting a survey to better understand the demographics of the genetics and genomics workforce, as well as the climate and culture in training programs and the workplace. We are pleased to also be working with groups such as the Association of Professors of Human and Medical Genetics (APHMG), the American Board of Medical Genetics and Genomics (ABMGG), and the Minority Genetic Professionals Network (MGPN). The project is funded by the National Human Genome Research Institute (NHGRI).

Earlier this year, more than 4,000 people like you provided invaluable insights as respondents to a first-of-its-kind Genetics and Genomics Workforce Survey. The aim was to assess the current demographic landscape, establish benchmarks, and establish a foundation for setting future goals and metrics. The next step in the Human Genetics and Genomics Workforce Initiative involves a more in depth discussion about workforce culture and climate to understand the factors affecting inclusivity in genetics and genomics professions.

### Introduction/Opening

#### [ALL]

Thank you for speaking with us today regarding workforce diversity and inclusion within the fields of genetics and genomics.

#### Purpose

As you know from our introductory note, research is underway examining workforce diversity in human genetics and genomics professions. Findings from this initiative will be used to establish the current demographic landscape of the genetics and genomics workforce and to develop ways to better serve all geneticists and genomics professionals. By helping us better understand your experiences, you will be helping create a better genetics and genomics workforce. My name is [name], this is my colleague [name], and we are the principal investigators that have been engaged to conduct this phase of the research.

#### Method

This **[interview/focus group]** will last about 60 minutes. We'll be using a guide with a series of open-ended questions, rating scales and follow up prompts to standardize the experience, and ensure that you're able to share insights on the same general areas as others. That said, it will not be a rigid script, and overall it should feel informal and conversational as we try to capture your thoughts, observations, and ideas. More than 4000 of your colleagues have already participated in phase one of the initiative - **[excluding MSI dept chairs: the survey that you also responded**



**to previously].** For phase two, we'll be speaking one-on-one, or in small focus groups, with up to 50 people from a wide range of backgrounds and different dimensions of diversity.

### Confidentiality

Your responses will be kept confidential now and in the future. Answers will be summarized and aggregated and quotes, if used in reports, will always be anonymous.

### Ground Rules

#### Interview

As you'd probably expect, an interview is a qualitative research method where we'll explore your beliefs, opinions, experiences and observations.

- Participation is voluntary, and we ask that you try your best to be open and candid.
- It's alright to abstain or discontinue at any time if you are not comfortable.
- All responses are valid—there are no right or wrong answers.
- The style will be conversational but try to stay on topic; we may need to interrupt to stay on schedule.
- Speak as openly as you feel comfortable, we are recording for our records only. The file will not be shared with anyone else, including ASHG, NHGRI, ACMG, NSGC and participating organizations., and our written report will not include any identifying information. This is confidential.

### Focus Group

As you may know, a focus group is a qualitative research method based on group discussions, beliefs and opinions.

- While we'll naturally be evaluating what people say vs. what they do, we ask that you try your best to be open and candid.
- By participating, you agree to protect each others' privacy by not discussing details afterwards.
- Participation in the focus group is voluntary.
- It's alright to abstain at any time if you are not comfortable.
- All responses are valid—there are no right or wrong answers.
- Please respect the opinions of others even if you don't agree.
- Try to stay on topic; we may need to interrupt to stay on schedule.
- Speak as openly as you feel comfortable, we are recording for our records only. The file will not be shared with anyone else, including ASHG, and our written report will not include any identifying information. This is confidential.
- The focus group is conversational, jump right in when you have thoughts. You may also notice that we'll make space for everyone, checking in to ask if you have anything

## QUESTIONNAIRE

### Ice Breaker

Before we dig into the heart of the conversation today, we'd like to get to know you a bit and vice versa. We like to do that with a completely unrelated question.

FG: Have you heard of speaking in popcorn order? After one person answers, they get to pick the next person. Think of it like passing the mic. Garet or Rhonda - why don't you get us started?

When was the last time you saw a live performance, and what was it?

	FG: Women	FG: Students / Postdocs	INT: Student / Postdocs	INT: Early Career	INT: Dept Chair
<b>General</b>	<p>On a scale of 1 to 5, how well is your employer doing in terms of building a diverse staff?</p> <p>On a scale of 1 to 5, how well is your employer doing in terms of building an inclusive environment?</p>	<p>On a scale of 1 to 5, how well is your university doing in terms of building a diverse student body?</p> <p>On a scale of 1 to 5, how well is your university doing in terms of building an inclusive environment?</p>	<p>On a scale of 1 to 5, how well is your university doing in terms of building a diverse student body?</p> <p>On a scale of 1 to 5, how well is your university doing in terms of building an inclusive environment?</p>	<p>On a scale of 1 to 5, how well is your employer doing in terms of building a diverse staff?</p> <p>On a scale of 1 to 5, how well is your employer doing in terms of building an inclusive environment?</p>	<p>On a scale of 1 to 5, how well is your university doing in terms of building a diverse faculty? student body?</p> <p>On a scale of 1 to 5, how well is your university doing in terms of building an inclusive environment?</p>
<b>Professional Affiliations</b>  We want to learn about your professional affiliations overall.	<p>Are you now, or have you been, a member of any other professional or trade organizations related to your career path in genetics or genomics? Y/N - Which?</p> <p>Are you a member of any online community(ies) for genetics or genomics outside of your organization? Y/N Examples? -Are any of them identity-based?</p>	<p>Are you now, or have you been, a member of any other professional or trade organizations related to your career path in genetics or genomics? Y/N - Which?</p> <p>Are you a member of any online community(ies) for genetics or genomics outside of [work/school]? Y/N Examples? -Are any of them identity-based?</p>	<p>Are you now, or have you been, a member of any other professional or trade organizations related to your career path in genetics or genomics? Y/N - Which?</p> <p>Are you a member of any online community(ies) for genetics or genomics outside of your organization? Y/N Examples? -Are any of them identity-based?</p>	<p>Are you now, or have you been, a member of any other professional or trade organizations related to your career path in genetics or genomics? Y/N - Which?</p> <p>Are you a member of any online community(ies) for genetics or genomics outside of your organization? Y/N Examples? -Are any of them identity-based?</p>	<p>Are you or your students members of any other professional or trade organizations related to career paths in genetics or genomics? Y/N - Which?</p> <p>Are you or your students typically members of any online community(ies) for genetics or genomics outside of your organization? Y/N Examples? -Are any of them identity-based?</p>

	FG: Women	FG: Students / Postdocs	INT: Student / Postdocs	INT: Early Career	INT: Dept Chair
<p><b>Engagement</b></p> <p>How people feel about diversity, inclusion and equity inside the workplace can have an impact on employee engagement and organizational performance.</p>	<p>On a daily basis, do you feel excited about going to class/work? 5 Always 4 Often 3 Sometimes 2 Not Often 1 Never</p> <p>If 1-3, why not?</p> <p>On a scale from 1 to 5, where 1 is Strongly Disagree and 5 is Strongly Agree, how would you rate the following statements? - My organization values diversity. - I would recommend my organization as a great place to work or matriculate. -My organization inspires me to give my very best.</p>	<p>On a daily basis, do you feel excited about going to class/work? 5 Always 4 Often 3 Sometimes 2 Not Often 1 Never</p> <p>If 1-3, why not?</p> <p>On a scale from 1 to 5, where 1 is Strongly Disagree and 5 is Strongly Agree, how would you rate the following statements? - My organization values diversity. - I would recommend my organization as a great place to work or matriculate. -My organization inspires me to give my very best.</p>	<p>On a daily basis, do you feel excited about going to class/work? 5 Always 4 Often 3 Sometimes 2 Not Often 1 Never</p> <p>If 1-3, why not?</p> <p>On a scale from 1 to 5, where 1 is Strongly Disagree and 5 is Strongly Agree, how would you rate the following statements? - My organization values diversity. - I would recommend my organization as a great place to work or matriculate. -My organization inspires me to give my very best.</p>	<p>On a daily basis, do you feel excited about going to work? 5 Always 4 Often 3 Sometimes 2 Not Often 1 Never</p> <p>If 1-3, why not?</p> <p>On a scale from 1 to 5, where 1 is Strongly Disagree and 5 is Strongly Agree, how would you rate these following statements? - My organization values diversity. - I would recommend my organization as a great place to work. -My organization inspires me to give my very best.</p>	<p>On a daily basis, are your students excited about coming to class? 5 Always 4 Often 3 Sometimes 2 Not Often 1 Never</p> <p>If 1-3, why not?</p> <p>On a scale from 1 to 5, where 1 is Strongly Disagree and 5 is Strongly Agree, how would you rate these following statements? - My organization values diversity. - I would recommend my organization to friends/family as a great place to matriculate.</p>
<p><b>Racial Discrimination/ Prejudice</b></p>	<p>Have you experienced or observed an instance of racial discrimination in the past two years in your program/ department? If so, how often? Y/N/Unsure 1 Never 2 Every year or two 3. A few times a year 4 A few times a month 5 Almost Daily</p> <p>If yes: How many of those instances would you guesstimate were reported? Reported to whom? Can you tell us about an example that stands out to you? Do you feel people of color can report race-based discrimination without fear of retribution or retaliation?</p>	<p>Have you experienced or observed an instance of racial discrimination in the past two years in your program/ department? If so, how often? Y/N/Unsure 1 Never 2 Every year or two 3. A few times a year 4 A few times a month 5 Almost Daily</p> <p>If yes: How many of those instances would you guesstimate were reported? Reported to whom? Can you tell us about an example that stands out to you? Do you feel people of color can report race-based discrimination without fear of retribution or retaliation?</p>	<p>Have you experienced or observed an instance of racial discrimination in the past two years in your program/ department? If so, how often? Y/N/Unsure 1 Never 2 Every year or two 3. A few times a year 4 A few times a month 5 Almost Daily</p> <p>If yes: How many of those instances would you guesstimate were reported? Reported to whom? Can you tell us about an example that stands out to you? Do you feel people of color can report race-based discrimination without fear of retribution or retaliation?</p>	<p>Have you experienced or observed an instance of racial discrimination in the past two years in your organizations? If so, how often? Y/N/Unsure 1 Never 2 Every year or two 3. A few times a year 4 A few times a month 5 Almost Daily</p> <p>If yes: How many of those instances would you guesstimate were reported? Reported to whom? Can you tell us about an example that stands out to you? Do you feel people of color can report race-based discrimination without fear of retribution or retaliation?</p>	<p>Have you personally experienced an instance of discrimination in the past two years in your program/ department? If so, what type? Y/N/Unsure Are you aware of students experiencing discrimination? If so what type? By whom? If yes: How often do you become aware of discrimination against students? 1 Never 2 Every year or two 3. A few times a year 4 A few times a month 5 Almost Daily If yes: How many of those instances would you guesstimate were reported? Reported to whom? Can you tell us about an example that stands out to you?</p>

	FG: Women	FG: Students / Postdocs	INT: Student / Postdocs	INT: Early Career	INT: Dept Chair
<b>Performance Management</b>	<p>My organization provides education and/or training in skills related to diversity. Y/N/Unsure</p> <p>Indicators and/or metrics related to outcomes in diversity, equity or inclusion are incorporated into staff evaluations/ performance reviews. Self Y/N Supervisor Executives All Staff</p>	<p>My university provides education and/or training to students/ postdocs in skills related to diversity, equity, and inclusion. Y/N/Unsure</p>	<p>My university provides education and/or training to students/ postdocs in skills related to diversity, equity, and inclusion. Y/N/Unsure</p>	<p>My organization provides education and/or training to staff in skills related to diversity, equity, and inclusion. Y/N/Unsure</p> <p>Indicators and/or metrics related to outcomes in diversity, equity or inclusion are incorporated into staff evaluations/ performance reviews. Self Supervisor Executives All Staff</p>	<p>My university provides education and/or training to faculty/ staff in skills related to diversity, equity, and inclusion. Y/N/Unsure</p> <p>Indicators and/or metrics related to outcomes in diversity, equity or inclusion are incorporated into faculty/ staff evaluations/ performance reviews. Self Supervisor Executives</p>
<b>Harassment</b>	<p>If you consider the 10 women you know best at work, how many do you have reason to believe have experienced sexual harassment? [number?]</p> <p>How many would you estimate reported their experience to company management, human resources, or another authority figure?</p> <p>Can you tell us about an example that stands out to you?</p> <p>Do you think a woman at your organization today can report sexual harassment without fear of retribution or retaliation? [Y/N/Unsure]</p> <p>-Would there be any difference based on the racial identity of the woman and/or aggressor? Explain.</p>	n/a	n/a	n/a	n/a

	FG: Women	FG: Students / Postdocs	INT: Student / Postdocs	INT: Early Career	INT: Dept Chair
<b>Complaint / Issue Resolution</b>	<p>Are there formal complaint procedures for staff regarding discrimination-related complaints?</p> <p>- If yes, is it effective in maintaining a physically and psychologically safe environment?</p> <p>- If no, is there an informal practice or norm? Is it effective in maintaining a physically and psychologically safe environment?</p>	<p>Are there formal complaint procedures for students regarding discrimination-related complaints?</p> <p>- If yes, is it effective in maintaining a physically and psychologically safe environment?</p> <p>- If no, is there an informal practice or norm? Is it effective in maintaining a physically and psychologically safe environment?</p>	<p>Are there formal complaint procedures for students regarding discrimination-related complaints?</p> <p>- If yes, is it effective in maintaining a physically and psychologically safe environment?</p> <p>- If no, is there an informal practice or norm? Is it effective in maintaining a physically and psychologically safe environment?</p>	<p>Are there formal complaint procedures for staff regarding discrimination-related complaints?</p> <p>- If yes, is it effective in maintaining a physically and psychologically safe environment?</p> <p>- If no, is there an informal practice or norm? Is it effective in maintaining a physically and psychologically safe environment?</p>	<p>Are there formal complaint procedures for faculty regarding discrimination-related complaints? Is there for students?</p> <p>- If yes, is it effective in maintaining a physically and psychologically safe environment?</p> <p>- If no, are there informal practices or norms? Is it effective in maintaining a physically and psychologically safe environment?</p>
<b>Supplier Related Systems and Policies</b>	<p>Does your organization have a supplier diversity requirements? Y/N</p> <p>Did it include:</p> <ul style="list-style-type: none"> <li>- alignment with corporate goals</li> <li>- tier 2 spend/policies (i.e. the supplier's own diversity programs and policies)</li> <li>- specific diversity categories you will focus upon, and specific certifications your program will accept.</li> <li>- supplier development/training for targeted diversity categories</li> <li>- other?</li> </ul>	n/a	n/a	<p>Does your organization have a supplier diversity requirements? Y/N</p> <p>Did it include:</p> <ul style="list-style-type: none"> <li>- alignment with corporate goals</li> <li>- tier 2 spend/policies (i.e. the supplier's own diversity programs and policies)</li> <li>- specific diversity categories you will focus upon, and specific certifications your program will accept.</li> <li>- supplier development/training for targeted diversity categories</li> <li>- other?</li> </ul>	<p>Does your university have a supplier diversity requirements? Y/N</p> <p>Did it include:</p> <ul style="list-style-type: none"> <li>- alignment with corporate goals</li> <li>- tier 2 spend/policies (i.e. the supplier's own diversity programs and policies)</li> <li>- specific diversity categories you will focus upon, and specific certifications your program will accept.</li> <li>- supplier development/training for targeted diversity categories</li> <li>- other?</li> </ul>
<b>Institutional Disclosures</b>	<p>Does your organization publish disaggregated race and ethnicity data in a way that is accessible to the staff and public?</p>	<p>Does your organization publish disaggregated race and ethnicity data in a way that is accessible to the staff and public?</p>	<p>Does your organization publish disaggregated race and ethnicity data in a way that is accessible to the staff and public?</p>	<p>Does your organization publish disaggregated race and ethnicity data in a way that is accessible to the staff and public?</p>	<p>Does your organization publish disaggregated race and ethnicity data in a way that is accessible to the staff and public?</p>
<b>Reward Systems</b>	<p>Are your organization's benefits packages developed using an all-inclusive approach?</p> <p>Is pay equitable in your organization?</p>	<p>[postdocs] Are your organization's benefits packages developed using an all-inclusive approach?</p> <p>[students] Is grading equitable in your program.</p> <p>[postdocs] Is pay equitable in your organization?</p>	<p>[postdocs] Are your organization's benefits packages developed using an all-inclusive approach?</p> <p>[students] Is grading equitable in your program</p> <p>[postdocs] Is pay equitable in your organization?</p>	<p>Are your organization's benefits packages developed using an all-inclusive approach?</p> <p>Is pay equitable in your organization?</p>	<p>Is hiring equitable in the genomics and genetics industry?</p>

	FG: Women	FG: Students / Postdocs	INT: Student / Postdocs	INT: Early Career	INT: Dept Chair
<b>Policies</b>	<p>Does your organization periodically assess the impact of organizational policies on equity? (e.g. medical leave, parental leave, holidays, hours)</p> <p>Is there a DEI leader or department at your organization? Yes / No / Unsure</p> <p>Who do they report to?</p>	<p>Does your organization periodically assess the impact of organizational policies on equity? (e.g. medical leave, parental leave, holidays, hours)</p> <p>Is there a DEI leader or department at your university? Yes / No / Unsure</p> <p>If yes, at what level of the organization? -school/college -university level</p>	<p>Does your organization periodically assess the impact of organizational policies on equity? (e.g. medical leave, parental leave, holidays, hours)</p> <p>Is there a DEI leader or department at your university? Yes / No / Unsure</p> <p>If yes, at what level of the organization? -school/college -university level</p>	<p>Does your organization periodically assess the impact of organizational policies on equity? (e.g. medical leave, parental leave, holidays, hours)</p> <p>Is there a DEI leader or department at your organization? Yes / No / Unsure</p> <p>Who do they report to?</p>	<p>Does your organization periodically assess the impact of organizational policies on equity for students? for staff/ faculty? (e.g. medical leave, parental leave, holidays, hours)</p> <p>Is there a DEI leader or department at your university? Yes / No / Unsure</p> <p>If yes, at what level of the organization? -school/college -university level</p>
<p><b>Barriers to Inclusion</b></p> <p>Let's talk a bit about how your organization does, or could, foster inclusion... in your organization and in the industry.</p>	<p>What factors have you found are most associated with a strong sense of inclusion?</p> <p>Conversely, in your personal experience, what factors contribute to exclusion?</p> <p>Can you share any personal examples (or examples you've observed directly) of what exclusion at work looks like, broadly speaking (not just your company)? - If yes, how did that make you feel? (or do you think that made them feel)?</p> <p>Is there a time or example you can share where you felt the environment was very inclusive? - What positively contributed to that experience?</p> <p>How much effort, on a scale of 1-5 where 5 is the most, does your organization put into ensuring the environment is inclusive? Is that to little, too much, or about right?</p>	<p>What factors have you found are most associated with a strong sense of inclusion?</p> <p>Conversely, in your personal experience, what factors contribute to exclusion?</p> <p>Can you share any personal examples (or examples you've observed directly) of what exclusion at work looks like, broadly speaking (not just your company)? - If yes, how did that make you feel?(or do you think that made them feel)?</p> <p>Is there a time or example you can share where you felt the environment was very inclusive? - What positively contributed to that experience?</p> <p>How much effort, on a scale of 1-5 where 5 is the most, does your organization put into ensuring the environment is inclusive? Is that to little, too much, or about right?</p>	<p>What factors have you found are most associated with a strong sense of inclusion?</p> <p>Conversely, in your personal experience, what factors contribute to exclusion?</p> <p>Can you share any personal examples (or examples you've observed directly) of what exclusion at work looks like, broadly speaking (not just your company)? - If yes, how did that make you feel?(or do you think that made them feel)?</p> <p>Is there a time or example you can share where you felt the environment was very inclusive? - What positively contributed to that experience?</p> <p>How much effort, on a scale of 1-5 where 5 is the most, does your organization put into ensuring the environment is inclusive? Is that to little, too much, or about right?</p>	<p>What factors have you found are most associated with a strong sense of inclusion?</p> <p>Conversely, in your personal experience, what factors contribute to exclusion?</p> <p>Can you share any personal examples (or examples you've observed directly) of what exclusion at work looks like, broadly speaking (not just your company)? - If yes, how did that make you feel?(or do you think that made them feel)?</p> <p>Is there a time or example you can share where you felt the environment was very inclusive? - What positively contributed to that experience?</p> <p>How much effort, on a scale of 1-5 where 5 is the most, does your organization put into ensuring the environment is inclusive? Is that to little, too much, or about right?</p>	<p>What factors have you found are most associated with a strong sense of inclusion?</p> <p>Conversely, in your personal experience, what factors contribute to exclusion?</p> <p>Can you share any personal examples (or examples you've observed directly) of what exclusion at work looks like, broadly speaking (not just your company)? - If yes, how did that make you feel?(or do you think that made them feel)?</p> <p>Is there a time or example you can share where you felt the environment was very inclusive? - What positively contributed to that experience?</p> <p>How much effort, on a scale of 1-5 where 5 is the most, does your organization put into ensuring the environment is inclusive? Is that to little, too much, or about right?</p>

	FG: Women	FG: Students / Postdocs	INT: Student / Postdocs	INT: Early Career	INT: Dept Chair
<b>Psychological Safety</b>	<p>On a scale of 1-5, with 5 = very comfortable, how comfortable are you discussing identity-related topics in the workplace?</p> <p>Have you engaged in or observed jokes or conversations about?                      - Your own race / Another race                      - Your own gender / Another gender                      - Your own sexuality / Another sexuality                      - Your own age / The age of coworkers younger than you / The age of coworkers older than you                      - Having kids / Not having kids</p> <p>If you make a mistake, do you feel it is unfairly held against you?                      Y/N                      If yes, why do you think that is the case?</p> <p>Do you feel psychologically safe when disagreements arise?</p>	<p>On a scale of 1-5, with 5 = very comfortable, how comfortable are you discussing identity-related topics in the workplace?</p> <p>Have you engaged in or observed jokes or conversations about?                      - Your own race / Another race                      - Your own gender / Another gender                      - Your own sexuality / Another sexuality                      - Your own age / The age of coworkers younger than you / The age of coworkers older than you                      - Having kids / Not having kids</p> <p>If you make a mistake, do you feel it is unfairly held against you?                      Y/N                      If yes, why do you think that is the case?</p> <p>Do you feel psychologically safe when disagreements arise?</p>	<p>On a scale of 1-5, with 5 = very comfortable, how comfortable are you discussing identity-related topics in the workplace?</p> <p>Have you engaged in or observed jokes or conversations about?                      - Your own race / Another race                      - Your own gender / Another gender                      - Your own sexuality / Another sexuality                      - Your own age / The age of coworkers younger than you / The age of coworkers older than you                      - Having kids / Not having kids</p> <p>If you make a mistake, do you feel it is unfairly held against you?                      Y/N                      If yes, why do you think that is the case?</p> <p>Do you feel psychologically safe when disagreements arise?</p>	<p>On a scale of 1-5, with 5 = very comfortable, how comfortable are you discussing identity-related topics in the workplace?</p> <p>Have you engaged in or observed jokes or conversations about?                      - Your own race / Another race                      - Your own gender / Another gender                      - Your own sexuality / Another sexuality                      - Your own age / The age of coworkers younger than you / The age of coworkers older than you                      - Having kids / Not having kids</p> <p>If you make a mistake, do you feel it is unfairly held against you?                      Y/N                      If yes, why do you think that is the case?</p> <p>Do you feel psychologically safe when disagreements arise?</p>	<p>On a scale of 1-5, with 5 = very comfortable, how comfortable are you discussing identity-related topics in the workplace?</p> <p>Have you engaged in or observed jokes or conversations about?                      - Your own race / Another race                      - Your own gender / Another gender                      - Your own sexuality / Another sexuality                      - Your own age / The age of coworkers younger than you / The age of coworkers older than you                      - Having kids / Not having kids</p>

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<p><b>Microaggression</b></p> <p>More than just insults or insensitive comments, workplace micro-aggressions are remarks, questions, or everyday insults rooted in bias related to someone's membership in a group that's discriminated against or subject to stereotypes.</p>	<p>Have you <b>experienced</b> a microaggression against yourself in the workplace? Y/N/Unsure, Explain.</p> <p>Have you observed <b>others</b> experience them? Y/N/Unsure, Explain. Who was responsible?</p> <p>How do you think aggressors should be managed?</p> <p>[Do Not Share – notetaking only]</p> <ul style="list-style-type: none"> <li>▪ Apology</li> <li>▪ Supervisor Intervention</li> <li>▪ HR intervention</li> <li>▪ Training intervention</li> <li>▪ Termination</li> <li>▪ Other</li> </ul> <p>Do you think that you have <b>committed</b> a microaggression in the workplace? Y/N/Unsure, Explain.</p>	<p>Have you <b>experienced</b> a microaggression against yourself in the workplace? Y/N/Unsure, Explain.</p> <p>Have you observed <b>others</b> experience them? Y/N/Unsure, Explain. Who was responsible?</p> <p>How do you think aggressors should be managed?</p> <p>[Do Not Share – notetaking only]</p> <ul style="list-style-type: none"> <li>▪ Apology</li> <li>▪ Supervisor Intervention</li> <li>▪ HR intervention</li> <li>▪ Training intervention</li> <li>▪ Termination</li> <li>▪ Other</li> </ul> <p>Do you think that you have <b>committed</b> a microaggression in the workplace? Y/N/Unsure, Explain.</p>	<p>Have you <b>experienced</b> a microaggression against yourself in the workplace? Y/N/Unsure, Explain.</p> <p>Have you observed <b>others</b> experience them? Y/N/Unsure, Explain. Who was responsible?</p> <p>How do you think aggressors should be managed?</p> <p>[Do Not Share – notetaking only]</p> <ul style="list-style-type: none"> <li>▪ Apology</li> <li>▪ Supervisor Intervention</li> <li>▪ HR intervention</li> <li>▪ Training intervention</li> <li>▪ Termination</li> <li>▪ Other</li> </ul> <p>Do you think that you have <b>committed</b> a microaggression in the workplace? Y/N/Unsure, Explain.</p>	<p>Have you <b>experienced</b> a microaggression against yourself in the workplace? Y/N/Unsure, Explain.</p> <p>Have you observed <b>others</b> experience them? Y/N/Unsure, Explain. Who was responsible?</p> <p>How do you think aggressors should be managed?</p> <p>[Do Not Share – notetaking only]</p> <ul style="list-style-type: none"> <li>▪ Apology</li> <li>▪ Supervisor Intervention</li> <li>▪ HR intervention</li> <li>▪ Training intervention</li> <li>▪ Termination</li> <li>▪ Other</li> </ul> <p>Do you think that you have <b>committed</b> a microaggression in the workplace? Y/N/Unsure, Explain.</p>	<p>Have you <b>observed</b> a microaggression against a student? Y/N/Unsure, Explain.</p> <p>Do you think that you have <b>committed</b> a microaggression against a student or colleague? Y/N/Unsure, Explain.</p>



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Stability - Separation	<p>In the past, how have you learned about opportunities for advancement/promotion inside your workplace?</p> <p>Have colleagues at your organization gone out of their way to create professional-advancement opportunities for you?</p> <p>Do you have anyone at your organization that you would call a <b>mentor</b>? (Y/N, how many, how did that relationship come to exist - formal program or organic relationship on own, describe how this person/s impact your career)</p> <p>Do you have anyone at your organization that you would call a <b>sponsor</b>? (Y/N, how did this relationship come to exist - formal or organic, describe an example of an action they've taken on your behalf that advanced your career.)</p> <p>Have you ever turned down or decided not to pursue a job because of a perceived lack of inclusion in that department or at that organization.</p> <p>- How likely would you be to turn down an opportunity for advancement in the future for that reason?</p>	<p>In the past, how have you learned about opportunities for advancement/promotion inside your program/workplace?</p> <p>Have colleagues at your organization gone out of their way to create professional-advancement opportunities for you?</p> <p>Do you have anyone at your organization that you would call a <b>mentor</b>? (Y/N, how many, how did that relationship come to exist - formal program or organic relationship on own, describe how this person/s impact your career)</p> <p>Do you have anyone at your organization that you would call a <b>sponsor</b>? (Y/N, how did this relationship come to exist - formal or organic, describe an example of an action they've taken on your behalf that advanced your career.)</p> <p>Have you ever turned down or decided not to pursue a job because of a perceived lack of inclusion in that department or at that organization.</p> <p>- How likely would you be to turn down an opportunity for advancement in the future for that reason?</p>	<p>In the past, how have you learned about opportunities for advancement/promotion inside your program/workplace?</p> <p>Have colleagues at your organization gone out of their way to create professional-advancement opportunities for you?</p> <p>Do you have anyone at your organization that you would call a <b>mentor</b>? (Y/N, how many, how did that relationship come to exist - formal program or organic relationship on own, describe how this person/s impact your career)</p> <p>Do you have anyone at your organization that you would call a <b>sponsor</b>? (Y/N, how did this relationship come to exist - formal or organic, describe an example of an action they've taken on your behalf that advanced your career.)</p> <p>Have you ever turned down or decided not to pursue a job because of a perceived lack of inclusion in that department or at that organization.</p> <p>- How likely would you be to turn down an opportunity for advancement in the future for that reason?</p>	<p>In the past, how have you learned about opportunities for advancement/promotion inside your workplace?</p> <p>Have colleagues at your organization gone out of their way to create professional-advancement opportunities for you?</p> <p>Do you have anyone at your organization that you would call a <b>mentor</b>? (Y/N, how many, how did that relationship come to exist - formal program or organic relationship on own, describe how this person/s impact your career)</p> <p>Do you have anyone at your organization that you would call a <b>sponsor</b>? (Y/N, how did this relationship come to exist - formal or organic, describe an example of an action they've taken on your behalf that advanced your career.)</p> <p>Have you ever turned down or decided not to pursue a job because of a perceived lack of inclusion in that department or at that organization.</p> <p>- How likely would you be to turn down an opportunity for advancement in the future for that reason?</p>	<p>How do your students typically learn about pre-professional opportunities for exposure to future professions in human genetics or genomics?</p> <p>Do you believe this is the same as, or different than, how students access such opportunities at predominantly white institutions?</p> <p>Outside of assigned academic advisors, do most students have a mentor? How many? How do those relationships come to exist - formal programs or organic relationships on their own?</p> <p>What are the key factors your students consider related to identity when exploring professional opportunities after graduation?</p> <p>Have you ever known students who turned down or decided not to pursue a job because of a perceived lack of inclusion in the hiring organization?</p>

## LAST QUESTIONS

(invite additional written remarks)

Is there any you expected or hoped we'd ask about that we haven't discussed?

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<b>Solutions / Blue Sky Thinking</b>	<p>If you could wave a magic wand to do or create anything to ensure people like you entering the profession over the next five years are positioned to thrive, what would you do?</p> <p>[Do not share - recruitment/hiring: reward systems/pay: support systems: (mentoring, training) policies: leadership attributes/ representation:]</p>	<p>If you could wave a magic wand to do or create anything to ensure people like you entering the profession over the next five years are positioned to thrive, what would you do?</p> <p>[Do not share - recruitment/hiring: reward systems/pay: support systems: (mentoring, training) policies: leadership attributes/ representation:]</p>	<p>If you could wave a magic wand to do or create anything to ensure people like you entering the profession over the next five years are positioned to thrive, what would you do?</p> <p>[Do not share - recruitment/hiring: reward systems/pay: support systems: (mentoring, training) policies: leadership attributes/ representation:]</p>	<p>If you could wave a magic wand to do or create anything to ensure people like you entering the profession over the next five years are positioned to thrive, what would you do?</p> <p>[Do not share - recruitment/hiring: reward systems/pay: support systems: (mentoring, training) policies: leadership attributes/ representation:]</p>	<p>If you could wave a magic wand to do or create anything to ensure people like you entering the profession over the next five years are positioned to thrive, what would you do?</p> <p>[Do not share - recruitment/hiring: reward systems/pay: support systems: (mentoring, training) policies: leadership attributes/ representation:]</p>

## CLOSING

The American Society of Human Genetics envisions a future where people everywhere realize the benefits of human genetics and genomics research. On behalf of The Alliance for Genetics and Genomics Workforce Diversity, we are deeply appreciative of your willingness to share your time and experiences with us to advance this mission.



