

Synberc Expanding Potential Seed Project Grant Proposal

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Program: Clear Direction Mentoring

OVERVIEW

It is well established that there is severe underrepresentation of minorities pursuing science, technology, engineering, and mathematics (STEM) education in the US.¹ Many efforts have begun to address this issue, including those by the National Institutes of Health, the National Science Foundation, and private organizations. These efforts have revealed a common contributor to the “leaky pipeline”: the lack of sustained mentorship for students after their initial inspiration to pursue careers in STEM. To address this problem head on, we have developed a new initiative called Clear Direction. **Clear Direction provides underrepresented minority high school students with invaluable exposure to STEM through formal long-term mentorship from current PhD and MD/PhD students.** These mentors are volunteers emboldened by passion and interviewed to ensure their commitment to mentor our high school participants in a long-term capacity. Furthermore, they receive administrative guidance provided by the NYU Sackler administration and W. Marcus Lambert, PhD, Director of Diversity, Recruitment, and Student Services at Weill Cornell Graduate School of Medical Sciences. So far, we have established relationships with 5 high schools; these relationships were established through recommendations from Dr. Jeanne Gabarino, The Rockefeller University Director of Science Outreach. The high schools were specifically selected because they have a large population of underrepresented minorities and are commonly overlooked for programs akin to Clear Direction. Faculty at these high schools nominate four to five 11th grade students with demonstrated interest in STEM for a 2-year commitment with Clear Direction. During the pilot year, mentors were NYU Sackler graduate students. However, we are in collaboration with the Minority Graduate Student Network-New York City (MGSN) to expand the mentoring cohort to neighboring institutions including Weill Cornell Graduate School of Medical Sciences, and Albert Einstein College of Medicine Graduate School. Once the students are nominated, a select group of Clear Direction mentors, administrators, and advisory members select a cohort for that year. Upon acceptance into Clear Direction, students, their parents, and the high schools are notified and each mentee is invited to a matriculation event comprised of empowering talks by scientists. This serves as an opportunity for everyone to gather in a neutral and safe setting, exposes students to exciting paths in academic science, as well as gives mentors the chance to learn about the goals, fears, and dreams of each individual student. After this initial encounter, mentors meet with their mentees on a monthly basis – at minimum - to help with school projects, prepare for the SAT, review college applications, and discuss career and personal development. Additionally, each student shadows his or her mentor in laboratory settings at the aforementioned top-tier science institutions. Additionally, there is a bi-monthly Clear Direction academy comprised of STEM-related theoretical lectures, followed by research presentations in those STEM-related areas. The objective of Clear Direction is to leverage the human capital of successful students in PhD and MD/PhD training programs with the underlying intention of establishing extended and meaningful mentor-mentee relationships. In doing so, we will not simply be exposing the mentees to premier scientific concepts, people, and organizations for a transient moment, but we hope to inspire a more diverse and passionate contingent of students pursuing careers in STEM through sustained and meaningful relationships.

RATIONALE FOR THE PROJECT

Clear Direction’s mission is in line with that of Synberc’s – to increase diversity in STEM. Specifically, Clear Direction provides an invaluable opportunity for underrepresented ethnic/racial minority high school students to receive dedicated mentorship by students pursuing STEM careers at top-tier institutions. Clear Direction offers an innovative approach to address challenges discovered by previous diversity-focused STEM-associated programs. For Clear Direction, that innovation lies in continued mentorship, long after the students’ initial participation in the program. This level of engagement will provide the guidance and support that many young students need, as well as provide teaching and mentoring opportunities to our student volunteers. We recently launched the Clear Direction pilot program, with graduate and medical student volunteers committed to “Lighting the Path to STEM for Underrepresented Minority High School Students”, this year’s mantra. This pilot program, which includes twenty-four students across all five boroughs of New York City was entirely supported by NYU Sackler Administration and the Sackler Student Council. To date, the students that participated in the Clear Direction’s pilot program have expressed growth in a myriad of ways, as determined by frequent surveys, and verbal expression. Additionally, we have logged hundreds of hours of face time between student mentees and mentors in labs, in libraries, and in classrooms. Through monthly Clear Direction academies, the students hear lectures to gain a foundation of knowledge on a biological concept and served lunch. Subsequently, there is a presentation of ongoing research being conducted by one of the mentors. Going forward, we will offer Clear Direction mentees science lectures by graduate students and post-doctoral fellows, research presentations, a science course at the Cold Spring Harbor Laboratory, and summer research opportunities in established laboratories of the mentee’s scientific area of interest.

WHAT UNDERREPRESENTED GROUP ARE YOU REPRESENTING AND WHY?

As an African-American male, I represent underrepresented racial/ethnic minorities in STEM. Furthermore, I represent a population not frequently exposed to careers in STEM, i.e., from a low socioeconomic background with minimal exposure to academic excellence, raised in crime-ridden neighborhoods, and with negative expectations of me. I have nearly one decade of military service with honorable discharging after multiple tours overseas, and have chosen a career in biomedical sciences, in which I am excelling within the lab and classroom as well as taking on leadership roles within my student community and Clear

Direction. Growing up in a crime-infested, poor neighborhood, where the likelihood of getting shot was greater than graduating high school, I recall asking myself, 'What would it be like if I had someone in my corner, who not only understood my living situation, but wanted to help me get out? What if someone who had already succeeded at what I really want to do someday was willing to help me succeed?' Now, 15 years later, I have the opportunity to transmit the invaluable lessons I have learned along the way to others.

WHAT CRITICAL NEED DOES THIS PROJECT SERVE?

Clear Direction ultimately aims to close the education and achievement gap for underrepresented minorities interested in pursuing – and succeeding – in careers in STEM. With all of its participants and the majority of the mentors being racial minorities, Clear Direction is providing inspiration for young minority students afraid to pursue STEM fields. They will be exposed to people who look like them and come from similar backgrounds who are already in graduate school or beyond. Several mentors in the Clear Direction program have already discussed how discouraging it was without a mentor or role model who looks like them. It is a common misconception for many young people today that minorities do not participate in STEM fields; this is something we would like to change with Clear Direction. By providing continued mentorship from current high-achieving PhD and MD/PhD students at institutions in NYC, Clear Direction will expose high school students to careers in STEM and encourage them to begin pursuing this career path during high school. By establishing relationships between our institutions and local high schools, completely novel opportunities for these students will arise. Through direct mentorship by successful scientists, we aim to establish a more fluid pipeline of STEM students with unprecedented emotional and career support. We strive, many as underrepresented minorities ourselves, to build an America where students have access to STEM mentors, academic paths, and careers regardless of their socioeconomic, ethnic/racial, religious, or geographical status.

WHAT SYNERGISTIC RELATIONSHIPS WILL THIS PROJECT HAVE WITH OTHER EFFORTS TO ADVANCE DIVERSITY IN STEM?

As a means of collaborating to expand Clear Direction to nearby institutions, Clear Direction will partner with MGSN-NYC. The MGSN-NYC is an organization founded and maintained by minority graduate students in the biomedical and natural sciences, advised by the New York Academy of Sciences (NYAS) and the Center for Translational and Basic Research-Hunter College. Its members comprise Master's, PhD and MD/PhD students who attend institutions in the NYC metropolitan area and conduct research in a variety of STEM fields including cancer, immunology, virology, and more. Integrating MGSN-NYC members into the cohort of available mentors and partnering with NYAS will increase our mentees' exposure to cutting edge science and expand our pool of mentors. Moreover, expanding our participation with other institutions lessens the travel burden on Clear Direction mentees. In order to do so, we will be accepting mentor applications from graduate students at Einstein School of Medicine, The Rockefeller University, and Cornell Weill Graduate School of Medical Sciences. Additionally, MGSN-NYC members will be solicited to for applications at partner institutions in NYC. This broadened mentor recruiting approach will allow us to provide a wide range of institutions for mentorship basing.

WHAT IS THE EXPERIENCE AND TRACK RECORD OF THE PROPOSER(S) IN CARRYING OUT SIMILAR ACTIVITIES IN THE PAST?

The Clear Direction mentoring core has an amazing resume of participation in programs akin to Clear Direction. All of the mentors have guided students in the past at various levels and have an interest in participating in long-term mentorship. Also, since we are all either medical or graduate school students, we can provide advice for how to reach the same goals and how to avoid some unnecessary mistakes. With a network of current students participating, we can still help students interested in fields outside of biomedical science and medicine. Additionally, I have had a myriad of experiences in my home community of Baton Rouge, Louisiana, abroad in countries such as Morocco, Tunisia, Ukraine, and others, as well as here in New York University. For example, during the time I spent as a U.S. Navy serviceman, I volunteered for orphanage rebuilding in Ghana and Morocco. While attending Southern University, I intentionally sought out minority students who were struggling in science courses and developed personalized tutoring strategies that best complimented their learning style. As the NYU Student Council Chair for Diversity and Outreach, I established the pilot program for Clear Direction and secured administrative and financial support from institutional leadership. Phillip Geter, a NYU third year graduate student and committed Clear Direction mentor, is the NYU site director for Let's Get Ready, a program geared toward assisting low-income students with SAT preparation, and college preparedness. Jessica Douthit, a NYU fourth year MD/PhD student, Clear Direction mentor, and trusted advisor participated in the Minority Access to Research Careers program during her undergraduate education. A focus of the program was to always reach back to young people as you take a step forward in order to fill the pipeline. Using her experiences and lessons learned along the way, Jessica was able to mentor younger students in the program who wished to attend medical school and MD/PhD programs. This program has also given her insight on how to succeed as a minority in STEM, and the importance of having a strong support system and sense of community in order to reach one's goals. Julia Derk, NYU Sackler Graduate Program's Student Council President and fellow Clear Direction co-creator, has over 6 years of high school STEM tutoring experience, 6 years as a Summer Camp Counselor, and also developed the Sackler Writing Center – a peer mentorship based thesis-editing program. She has sustained numerous peer leadership roles managing a multitude of people, projects, budgets, and working in concert with academic administration in order to expand the reach and efficacy of NYU's programs. In summary, our experiences are a testament to our commitment to guiding underrepresented racial/ethnic minority into STEM.

¹National Science Board. 2014. *Science and Engineering Indicators 2014*. Arlington VA: NSF (NSB 14-01).