

CONNECTING PIPELINES TO PATHWAYS FOR HEALTH EQUITY

Pipeline Programs to Foster Diversity in the Health Professions:
Supporting Students from Junior High to Graduate Levels

LOMA LINDA UNIVERSITY

KEY POINTS

Loma Linda University, as part of its overall mission to work in service to the local and global communities and underserved populations, has developed multiple pipeline and pathway programs designed to introduce prospective students to the health professions and provide supportive programs to enhance their skills in continuing with or preparing for entry into health professions education programs:

- ✓ **San Manuel Gateway College:** A partnership between the community workforce development and university scholars, in which certificate programs are offered to high school graduates who are interested in the healthcare field
- ✓ **MITHS Program:** A three-week challenging summer program to introduce Black Seventh-day Adventist high school students to careers in the health sciences
- ✓ **Apprenticeship Bridge to College (ABC) program:** An eight-week, full-time summer program in health disparities research for high school students, including hands-on biomedical research experience
- ✓ **Undergraduate Training Program (UTP):** A nine-week summer research internship for undergraduate college and university students, featuring practical lab experience and mentorship
- ✓ **Summer research project training** to enable minority medical students to gain basic research and scientific experience
- ✓ **Multiple pipeline programs** designed to expose minority students to health professions and science career options:
 - Discovery Program
 - Robotics Simulation
 - My Campus
 - Junior Science Fair

ISSUES AND CHALLENGES

Helping to recruit students to higher education and the health professions to increase diversity in the biomedical workforce in the local and global communities and nationwide.

Loma Linda University (LLU) is dedicated to promoting programs that work toward LLU's goal to eliminate health disparities and increase the number of basic biomedical and physician scientists from diverse backgrounds in research.



APPROACH

Design programs to attract disadvantaged students from the Inland Empire of southern California as well as underrepresented minority students from around the country to the science and health professions.

This case study focuses on the multiple pipeline and pathway programs developed at Loma Linda University, which were designed to: introduce underrepresented students (junior high to graduate-level) to options in the science and healthcare professions; provide hands-on experiences that entice interest; offer mentorship from expert scientists; and enhance skills in continuing with or preparing for entry into health professions education programs.

San Manuel Gateway College (SMGC)

Since 2016, SMGC has been a successful collaboration of LLU schools, LLUMC medical residents, the Social Action Community Health System (SACHS) (FQHC), community agencies, workforce development partners, and the San Manuel Band of Mission Indians, who provided the founding gift of \$10M.

This collaboration is part of a new era of service to individuals and families in the Inland Empire, and provides a unique educational model for the nation. It demonstrates an ideal relationship between traditional higher education and career/vocational training. LLU and SMGC are testing a model that is rarely attempted by universities—a partnership between the community workforce development and university scholars. This model exposes SMGC students to a multi-faceted,



interprofessional structure of career training in which all levels of healthcare practice (seasoned practitioners, residents, university students, and SMGC students) are participants in both teaching and learning. Their training is embedded in a higher education atmosphere. SMGC students are required to take a small number of transferable credits to build competency and confidence, while also encouraging them to consider academic degree programs in the future.

SMGC students receive supplemental funding, which allows tuition costs to remain low in comparison to career colleges. Most students (70 percent) receive need-based scholarships or are fully sponsored by employers in the community.

To date, SMGC has graduated 391 students. Approximately 80 percent of the graduates gained employment in their area of study upon graduation, while 15 percent have continued advanced studies after graduation.

SMGC's students are generally from low-income families. Upon acceptance into their respective programs, they are often unprepared for education beyond high school. However, as a result of the learning environment and skilled faculty mentoring and tutoring provided at SMGC, we have encouraged and they have achieved success.

Minority Introduction to the Health Sciences (MITHS) Program

MITHS is a challenging three-week summer program designed to introduce Black Seventh-day Adventist high school students to careers in the health sciences. During the course, participants experience first-hand what happens at a health sciences university. In order to best prepare students for higher education in these careers, a focus on enhancing test-taking skills in anatomy and physiology, mathematics, reading comprehension, and writing is implemented throughout the program. Students are able to listen to courses taught by LLU faculty, tour the hospital and simulation center, and learn the fundamentals of professions in the health sciences. The MITHS experience strives to prepare students for their senior year of high school and introduce them through an interactive experience on what to expect in college.

Apprenticeship Bridge to College (ABC) Program

The ABC High School Program offers a summer internship in health disparities research for high school students in the Inland Empire, Southern California. Students participate in a full-time, eight-week summer program featuring:

- hands-on biomedical research experience under the supervision of an expert scientist;
- seminars on health disparities (examining the disproportionate burden of diseases—such as diabetes, stroke, cancer, and HIV/AIDS—among minority and medically underserved populations);
- enrichment educational activities that strengthen skills critical for a successful career in the biomedical sciences, such as math, English, analytical thinking, and scientific communication; and
- recreational activities that give students a chance to enjoy time off with program peers and mentors.

A key objective of the ABC internship program is to increase diversity in the biomedical workforce in our local community and nationwide. To achieve this goal, applications from students with disadvantaged backgrounds and students who belong to groups that are nationally underrepresented in the STEM (science, technology, engineering, and math) disciplines are strongly encouraged.

Undergraduate Training Program (UTP)

UTP is a nine-week summer research internship for undergraduate college and university students. The internship focuses on giving students practical lab research experience alongside distinguished faculty, while providing mentorship in support of their future academic and research goals. The program supports LLU's goal to eliminate health disparities and increase the number of basic biomedical and physician scientists from diverse backgrounds involved in research.

Medical Training Program (MTP)

MTP enables underrepresented minority medical students to gain basic research and scientific experience on a selected summer research project with prominent scientists. The MTP program



is offered by the Center for Health Disparities and Molecular Medicine and aims to engage underrepresented medical students interested in integrating biomedical research in health disparities in the practice of medicine.

Community-Academic Partners in Service (CAPS) Programs

- **Discovery Program:** The Discovery program is a two-week program for underrepresented minority high school students in the Inland Empire interested in the health careers. This event gives high school students an opportunity to participate in an interactive learning environment, highlighting patient care and careers in allied health, behavioral health, dentistry, medicine, nursing, pharmacy and public health. Daily team-building activities and a day of community service in the local community round out the two-week program. A third week of shadowing is available to select students 17½ years of age and older. Lunch and snacks are provided, and housing is available for students from further areas of San Bernardino and Riverside Counties. Due to COVID-19, the 2020 and 2021 programs are virtual and the third shadowing week has been suspended with other mentoring and shadowing opportunities available.
- **Robotics Simulation:** The Robotics Simulation event is a pipeline program for high school juniors and seniors that teaches them about robotics in healthcare. LLU hosts this event twice a year in partnership with the Surgical Hospital at LLU and their staff. The event

takes place usually in the mornings between 8:00 and noon and incorporates an overview presentation, guest speaker, and time in the surgical rooms, where the students can have hands-on experience with the DaVinci robot to feel what it is like to be a surgeon. The staff set up different simulations and answer any questions students may have. The students also meet with an invited guest healthcare professional, who shares experiences and answers any questions students may have.

- **My Campus:** My Campus is a quarterly program designed for underrepresented minority high school students in the Inland Empire. It provides high school students an interactive experience, led by Loma Linda University students and faculty, in various health schools: Schools of Nursing, Dentistry, Medicine, Pharmacy, Public Health, Allied Health, and Behavioral Health. The program is held at Loma Linda University's campus and features two or three different schools each quarter. Students receive an introduction to the schools and professions, engage in hands-on experience, and interact with current Loma Linda University students. After the school presentations, speed-mentoring takes place, allowing high school students to interact with Loma Linda University students in various health tracks. This program is free for participants. Due to COVID-19, the 2020 and 2021 programs have been virtual.
- **Junior Science Fair:** The goal of this yearly event is to engage and inspire middle school students to pursue a career in healthcare.

The program targets youth as they transition into high school. This event is by invitation only, and LLU works with specific middle schools to determine what students are able to attend. Due to space limitations, LLC hosts between 90 and 110 middle school students, who participate in different planned activities. In order to allow more students to be part of this event, middle schools are rotated each year and LLU works with different school leaders to get the students out to the campus. The science fair typically lasts about four hours and includes interactive workshops, tours of both the Embryology museum and the simulation lab, and an exhibit of different booths representing various schools and clubs on campus.

CHALLENGES TO PROGRAMS' SUCCESS

Pipeline programs reach out and bring in resources, mentorship, and pathways for communities where higher education may not be as accessible. These programs often present with challenges that the organizing teams, school administrators, teachers, and students and their families must overcome. In the past year, COVID-19 has created an additional set of challenges, such as moving from in-person to virtual sessions, creating interactive sessions via Zoom, and Zoom fatigue and burnout for all—especially the young students with whom we work.

COVID-19 Challenges:

- Technology, computer, and internet access for students—this has especially impacted the participation of our Native American students.
- Multi-family or high-density households—these living situations make it difficult for students to find their own quiet space to participate in these programs.
- Virtual sessions—there is lower participation amongst students and less availability for direct interaction. Students are often exhausted from being on a screen for hours already for school and may be hesitant to sign up for another program.



General Challenges:

- Many students do not have the financial means to put themselves through college. The scholarships offered are limited by how the funding is presented to students: some may be taxed or it may be sent directly to their institution when they may need it for other materials or housing.
- It can be difficult to find strong faculty/staff advocates within the school district who can help us connect with students directly.
- Time and availability have been a challenge for some students; some either dropped out or could only commit certain hours to our program due to work, school orientations, transportation, and family emergencies.
- Creating outreach/engagement to specific demographics, in particular male students from all demographics and our Native American and Black students.
- Shortage of dedicated staff (including leadership) who can focus on year-round support. Lack of personnel to promote/market programs (to increase applications), track alumni, etc.
- Limitations, such as internal policies (regarding number of hours, age criteria, etc.) and inability to participate (due to timing, competing obligations, etc.).
- Increase and market connectivity between the various LLU pipeline programs.

RESULTS/OUTCOMES

Our definition of success is met if the students go to graduate school anywhere. It is an added indication of success if they matriculate to LLU.

- Pipeline Programs Numbers:
 - > Total: 768 participants (2005-2020): CAPS Summer Programs
 - > Discovery Program 2021: 69 prospective students attending in July 2021
 - > Jr. Science Fair 2019: 110 students
 - > Jr. Science Fair 2020: 95 students
 - > Robotics Surgery Simulation: Average 15 students per event
 - > My Campus 2019/2020 Participants: 91 students attended these events
 - > My Campus 2020/2021 Participants (virtual): Fall (25 attendees), Winter (18 attendees), Spring (19 attendees)

FOR MORE INFORMATION AND RELATED MATERIALS ABOUT THE LOMA LINDA UNIVERSITY PIPELINE PROGRAMS

San Manuel Gateway College

SBCUSD School district—We partner with the local school district for our CAPS programs, ranging from tutoring to music lessons, while also inviting the middle and high school students to be part of our pipeline programs, such as My Campus and the Discovery Program.

Making Hope Happen Foundation—The Making Hope Happen Foundation works closely with the San Bernardino County Unified School District and our partners. A few of our students also have received scholarships through their foundation. They are also a direct partner to the LLUH Community Benefits program.

Discovery Program (video)

https://www.youtube.com/watch?v=R17s_v85JuM

<https://caps.llu.edu/volunteer-now/discovery-inspiring-health-professionals-tomorrow>

CAPS – My Campus, Speed Mentoring, Christmas Fiesta, Tigers Water Safety, Healthy Neighborhood Projects, Goal 4 Health

<https://www.youtube.com/watch?v=CYVbmfYy9xo>

<https://caps.llu.edu/>

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