

## Student Newsletter

### Four Directions Summer Research Program: A Reflection

By: Sean Paul Begay

My name is Sean Paul Begay and I am currently in my second year in the Northern Arizona University American Indian Nursing Program. Last semester, I applied to the Four Directions Summer Research Program that is an 8-week research program that enables participants to engage in a project that is related to their own medical interests. The program is partnered with Brigham and Women's Hospital, Harvard Medical School and Partners Healthcare. The summer incorporated an array of workshops such as learning

how to effective while medical well as participants fields of study pertain to primary care, public health, program was experience timeframe for



become an applicant applying to schools as exposing to differing whether it neurology, oncology, etc. The a very intense since the our own

Sean Begay at the Harvard School of Public Health

individualized project was limiting. I was placed into Dr. Cliff Tabin's Lab that is located in Harvard Medical School's New Research Building.

Dr. Tabin has a PhD in Genetics and has done extensive research throughout his time with Harvard University. Being in his lab was intimidating, but also a great pleasure because I met people throughout different parts of the world such as Europe, Asia, Africa and the Middle East. My mentor was Nicolas Rohner, a post-doctoral fellow from Germany. His work involves *Astyanax mexicanus*, a type of cavefish from Mexico. My project was a

pilot study that involved the DNA analysis of 2 different forms of *Astyanax mexicanus*: a surface-dwelling and cave-dwelling form. The surface-dwelling fish have a darker pigmentation, eyes and faster metabolism as opposed to their cave-dwelling counterparts who have albino pigmentation, no eyes and weigh more. By using this natural model, we analyzed different genes that could withhold mutations or changes that determine the overarching physical characteristics of each cavefish form. Overall, we would determine if these mutations were conserved or non-conserved to the species meaning that specific gene residue could possibly be found in other species as well. The project was very difficult, but I enjoyed every struggle because it taught me that I must always push forward no matter how arduous a project may be.

Overall, the program encourages American Indians to apply to any Medical School throughout the United States, not letting certain aspects such as a GPA or MCAT score from holding that person back. I think it was a great opportunity to meet other people from different tribes throughout the United States since each tribe has their own unique perspective in terms of culture, tradition and beliefs. If I had to give all American Indian students a piece of advice, it would be to encourage them to participate in a research program during the school year or summer in order to give them a perspective of how the entire research process works. Conducting research enables one to expand on existing knowledge or create new forms of expertise, imparting various forms of information onto others for future generations to come. I thank you all for reading this passage and I hope all current students pursue or engage in some form of research!