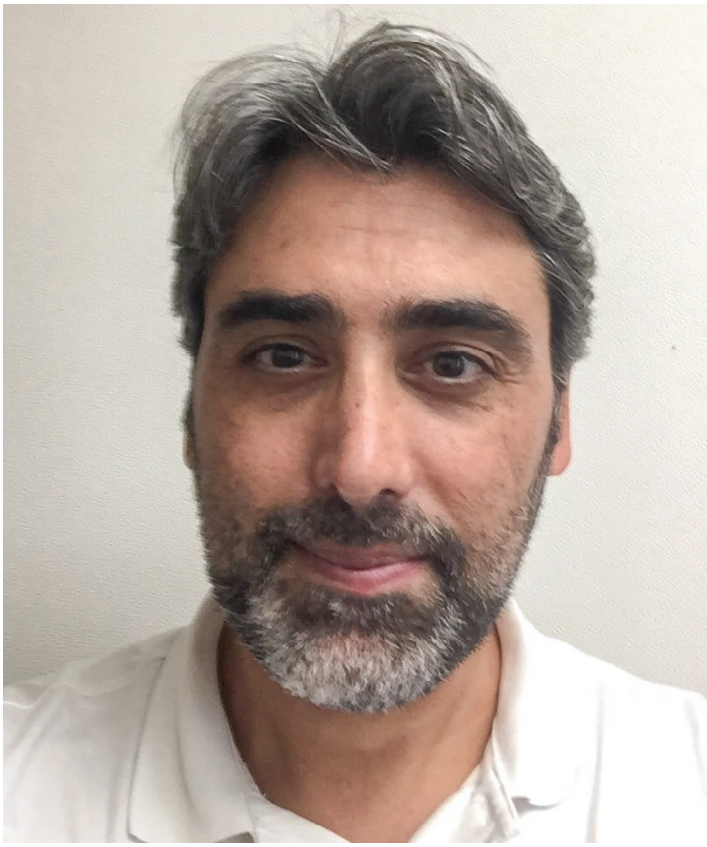

Neuroscience with Native American Undergraduates

by Cynthia Mwenja, PhD

Yaniv Cohen, Associate Professor of Biology and Chair of the Biology and Exercise Science Department at Bacone College, is poised to create not only a strong science program but to establish the first Native American neuroscience research institution in the United States. A native of Israel, Cohen completed his doctoral degree in neuroscience before moving to New York for a post-doctoral position at New York University. His research has focused on using Electrophysiological, Pharmacological, and Behavioral approaches to study olfactory memory and learning in rodents.

Bacone

Linda Jordan, English Specialist and Chair of the Division of Liberal Arts at Bacone, offers some background about the institution. She says that Bacone was founded in the 1880s "for the sole purpose of educating American Indians to be preachers and teachers; the student body has been mainly American Indian throughout its history." In fact, Bacone is the oldest continually operating institution of higher education for Native American people in the United States. Jordan notes that the college was internationally famous in the 1930s to 1950s for its art school, which has had a great influence on American Indian art. As time went on, the school faced a series of challenges, ultimately collapsing in 2018. To recover, the school appointed Ferlin Clark, who is a member of the Navajo Nation, as President. He is working with constituents across the campus to develop a new, future-oriented vision for the school and its academic offerings. While the college currently remains a private school, it is preparing to become a tribal college in the future. Jordan was part of the team working with Clark to develop the new direction for the school. She says that some programs had become outdated, offering curricula that had little to do with the needs of the students. With a population that is largely first-generation and low-income, Bacone needed to turn toward providing an education to better serve the student body.

Jordan first encountered Cohen when he applied to work as a tutor in the TRiO program. Cohen had moved to the area with his wife, who is a Muskogee native. Once he was hired, Jordan says he was a "perfect fit" who employed effective teaching methods; he quickly became a very popular tutor. After Cohen left to work at other universities in the area, he was not forgotten at Bacone. According to Wambli Sina Win, Vice President of Academic Affairs at Bacone, he made such an impression on the students when he was serving as a tutor that "when a position [in science] came open, there was no one else" they wanted to consider. Jordan confirms this point, saying that "everyone loved him" during the hiring interviews. Outside of his personal charisma, Cohen brings a strong academic resume to the position, having published important peer-reviewed articles during more than eleven years of neuroscience research.

Vision

As Win states, "Yaniv came in like a breath of fresh air—a gust of wind—he blew in; he has such energy about him." Bacone hired Cohen to implement his vision, which is to establish the first undergraduate neuroscience program at an institution of higher education for Native American people. He embodies the exciting possibilities of current educational models, and he is shifting the science program to encompass an array of sciences. While he hopes to develop several branches of science within the department, he will first focus on growing the neuroscience branch.

In his research, Cohen has discovered that rodent olfactory cortex displays task- and state-dependent cortical asymmetry. He hopes to involve his students at Bacone in continuing this research with human subjects by using Electroencephalogram (EEG) and novel olfactory navigation tasks. Having students participate in neuroscience research, both as study participants and researchers, is a completely new idea and model at Bacone. According to Jordan, these exciting changes have support both on campus and within the community. Jordan notes the similar re-visioning is happening in programs

across campus; Bacone hopes to re-establish its nursing program and develop its cyber/computer program, alongside the development of the science program.

Building the Department

Currently in the first semester of his new position, Cohen is carefully and methodically building toward the future he envisions. Win notes that Cohen is in the process of looking at lab space, and Cohen says that the campus has "lots of space with promising potential" for his program to grow. On the curriculum side of things, Cohen is re-building the department from the ground up. Before he joined the faculty, science offerings at Bacone had become quite limited, focusing on human biology and related courses to support the students in health sciences. Cohen is expanding the offerings and increasing the diversity of biology courses to anchor the unfolding science program. He is bringing back microbiology, which is essential to nursing, as he points out, along with adding neuroscience with a research component. His goal is to have the biology program and neuroscience degree on firm footing within two years.

Even though he is still in his first semester on the job, Cohen recently submitted the first of several large grants he is targeting to help build the program. This first grant will fund work in Cohen's specialty, electrophysiology research. In the spring, he will submit a proposal to a National Institutes of Health grant which specifically targets Native American undergraduate institutions such as Bacone. He will follow these proposals with a submission in Summer 2022 for the Templeton grant; this organization supports programs that combine spirituality and science—and professors who merge the two.

Because of Cohen's presence on campus, Bacone is now positioned to expand in multiple ways. Bacone's campus is next to Muskogee High School, and Cohen has already begun outreach there. Win says they hope to attract students who are interested in science to attend Bacone. Win notes that Cohen is connected to a "network of qualified adjuncts" who should be able to support the burgeoning departmental offerings. Cohen also plans to collaborate with nearby colleges

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Win reports that Cohen offers a student-centered approach in his teaching style; she sees that he gives his students and advisees a great deal of individual attention. As Win says, Cohen is very well-qualified—"brilliant"—but also humble; he is willing to "just talk to students on whatever level they're on with no judgement."

such as Northeastern State University at Broken Arrow. His research agenda will supplement their programs, he says, because they don't have research on olfaction using EEG.

Win remembers a saying: "If you want to get something done, give the task to a busy person." She says that Cohen is that busy person who gets things done; he "has a lot on his plate, but he's very conscientious and has an incredible work ethic." Cohen agrees that he is busy with three areas of focus: building the program, writing grant proposals, and working with students.

Students

Win says that Cohen's enthusiasm is contagious; students are now becoming excited about possibilities that lie in studying science. Even though it will take time for students to become fully aware of the new direction Cohen is leading the department, Win notes that Cohen's "youthful energy" is going far with the student population, which is now back on campus after a few semesters of slogging through Covid-related online attendance fatigue. As she states, "Sometimes students are intimidated by math and science, but due to Cohen's approach and demeanor, students are more open."

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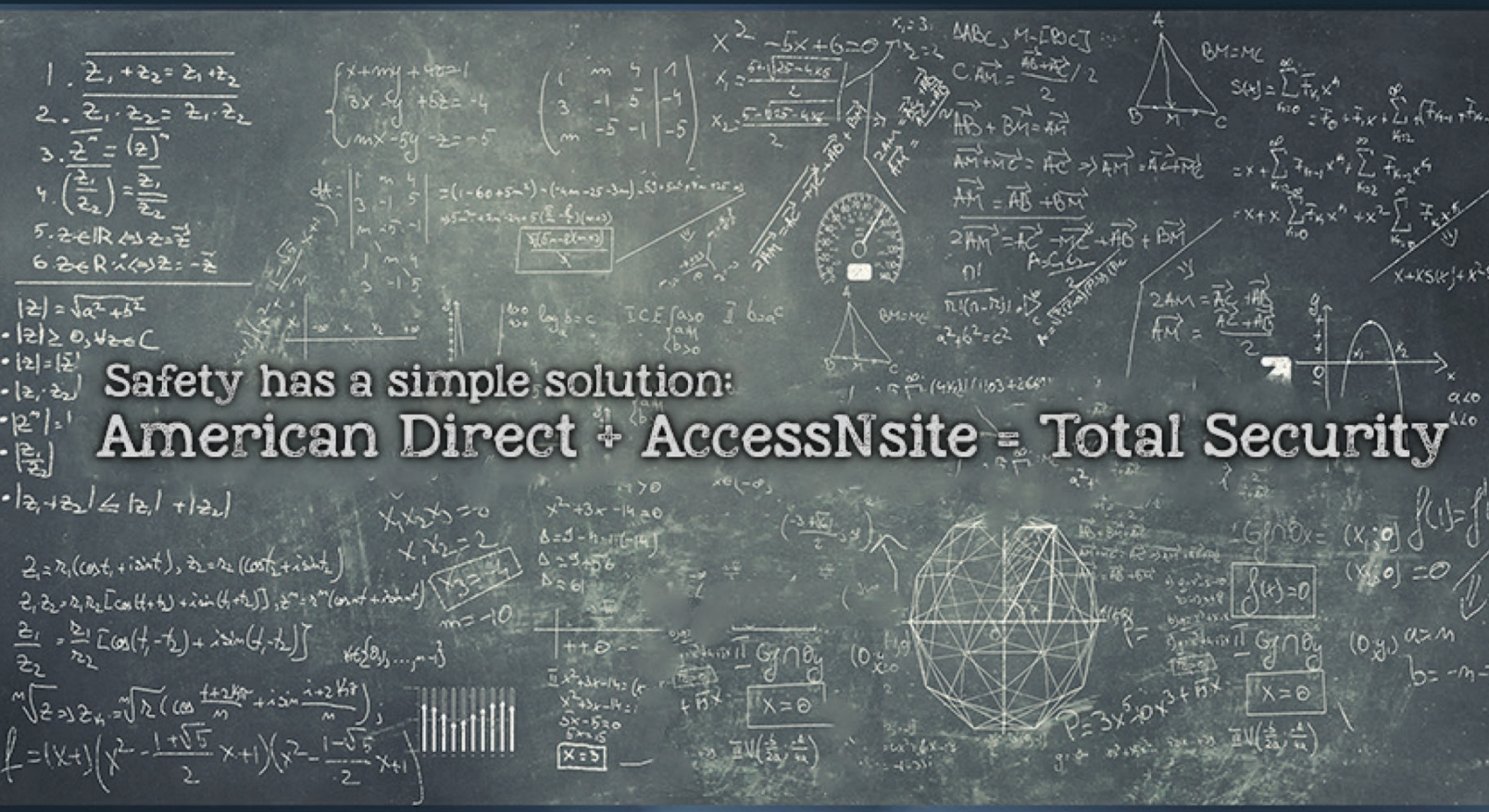

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Science Plus Spirituality

In seeking to understand the connection between mind and brain, Cohen has come to embrace the view that the brain is a mechanism that allows people to express who they are; it is, he says, the "interface between self and the environment." This view opposes those who believe that the brain is the person. His field ponders the questions of how the brain produces or houses the self. While memory is the largest constituent in who a person is, Cohen says, we still don't understand how those internal memories are "stored" in the brain. Moreover, the way the memories recall, often in a voluntary or conscious manner, is even more mysterious.

Cohen is writing a book to explicate his philosophy which frames the three psychological, biological, and physical domains in terms of internality and externality; for instance, he sees the brain as an external expressive part of the internal mind. He says that we need to establish a new way of thinking which bridges the scientific methodology with spiritual wisdom, and this view aligns with Bacone's long history as an institution which embraces spirituality via religion and philosophy.

Win notes that roadrunners are becoming more common in the area around Bacone, and she sees commonalities between Cohen and these creatures who move so quickly. Cohen has "hit the ground running," Win says, like the road runners do. He does, however, slow down long enough to focus on his students. She says that "A great teacher gives a part of themselves, and Yaniv shares his big heart with his students."

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