

2016-2017 Outstanding Thesis Award Winner Nelson Membreno



Nelson Membreno (left) accepts his award from Dr. Beer during the 2017 Graduate Student Orientation.

Nelson Armando Membreno, a 2017 graduate of the M.S. Biology program, has been awarded the Outstanding Thesis Award in the Biological Sciences, Mathematics, and Physical Sciences category. Membreno's groundbreaking work, *Effects of eggshell removal on embryonic skeletal development in the American alligator (*Alligator mississippiensis*)*, investigates the effects of removing eggshells from species which rely on their shells for calcium, theorizing that it would compromise growth and bone development. His work is remarkable in that after the eggshells were removed, the embryos remained viable, allowing him to compare the experimental hatchlings' growth with the control group. Membreno acquired 340 alligator eggs from the Rockefeller

Wildlife Refuge in Grand Chenier, Louisiana, and went to work on the experimental group of eggs and removing their eggshells to begin studying the results. His study showed calcium depletion during embryonic development inhibited the alligators' growth and caused them to develop a flexible lower jaw, reducing bite force.

During his undergraduate career at CSU Stanislaus, he mainly focused on research in genetics; it was not until he came to CSUSB and took Dr. Owerkowicz's class, "Advanced Topics in Vertebrate Zoology" that he shifted his academic focus to studying the physiology of live animals. Membreno says that he "found the research papers we were reading fascinating" and later joined his lab and discussed "using the American alligator as [their] animal model."

Membreno is a part-time adjunct lab instructor at CSUSB and has been a part of the faculty since 2011 after he graduated from CSU Stanislaus with a B.S. in Biology. He aims to enroll in a Ph.D. program for the 2019-2020 academic year, studying comparative vertebrate anatomy and physiology; upon completion, he plans to continue working at the university level as a professor and as a researcher. Membreno has already presented his findings at local, national, and international conferences and is converting his thesis into two manuscripts, which he hopes to publish in the *Journal of Experimental Biology*. His work is already making an impact in the field of comparative vertebrate anatomy and physiology and is expected to inspire further study.