Andres Sanin

Title: Mechanics of Fish Skin: The Lateral Tendon Revisited

Mentor: Christopher Kenaley, PhD

Studying the biomechanical role of skin in locomotion and feeding has received very little attention by researchers. Only the studies of Hebrank and Wainwright have focused on the role that skin plays during undulatory swimming. Some researchers have suggested that the skin may act as a force-transmitting material. In addition, the dermis of fish skin is composed of orthogonally arranged helices that wrap around the body, which result in a lateral "exotendon", which resists longitudinal lengthening and prevents hoop contractions when the internal pressure is increased after a bending moment. These results have only been evaluated for a small number of taxa, which includes a single species of shark (*Negaprion brevirostris),* the American eel (*Anguilla rostrata),* and the Norfolk spot (*Leiostomus xanthurus).* In this study, we revisit the role of skin in energy storage during swimming and investigate to what extent skin stiffness may vary across the trunk. We also sought to explain whether longitudinal stiffness of fish varies across the body, and whether these differences in material properties contribute to differences in function.