Hector was born in Tunja, Colombia. He received his bachelor in Pharmaceutical Science's degree in 2016 at Universidad Nacional de Colombia. In summer and fall 2015, he was a visiting scholar at Purdue University in the department of Agriculture and Biological Engineering (ABE). In spring 2018, He joined the ABE department as a graduate student with a fellowship from Colfuturo, United States Agency for International Development (USAID) and the United States Department of Agriculture (USDA) under Cacao for Peace (CfP) agreement-scholarship project. He is also a recipient of complementary financial aid from the Dane O. Kildsig Center of Pharmaceutical Processing and Research (CPPR). At Purdue, during his master studies, he was teaching assistant of ABE 304's course and an Interim laboratory manager in the Center for Particulate Products and Processes (CP3). He is grateful for all the resources and opportunities that Purdue University and his advisors provided to him to improve his communication skills and academic learning.

Agricultural & Biological ENGINEERING

Thesis Defense

Speaker: **Hector Lozano Perez**

Title: **The Role of Surface Properties on the Physical Attributes and Stability of Cocoa Powder Systems**

Major Professor(s): **Dr. Teresa Carvajal, Dr. Kingsly Ambrose**

Date: **Thursday, July 23, 2020**

Time: **1:00 P.M**

Link to join: WebEx

Abstract:

Cocoa is the main ingredient in the formulation of chocolate-based products. Unfortunately, industrial issues are constantly encountered during handling and processing of the cocoa materials. Cocoa is a complex system because it contains multiple constituents distributed heterogeneously within the particle, of particular interest, components located at the surface. Surface composition is especially critical for understanding surface particle interactions with other materials and the environment, with subsequent effect on performance and stability of the cocoa powders. The characterization of surface properties of complex particles is challenging. In this research, we developed a systematic approach that enables surface chemistry, energetics and morphology contributions to interactions of the cocoa particles. The results suggest that, a hydrophobic surface, such as provided by the lipids, impacts powder flowability performance and wettability. The importance of lipid surface composition may be manipulated and controlled to improve performance and stability of the cocoa powders. This work shows the significance of assessing surface properties, chemistry and energetics, for having a fundamental insight of the behavior of complex powder systems.

Application:

This research contributes to the understanding of the industrial challenges for handling cocoa powders. The study identifies particle surface composition and powder physical characteristics that enable the control of these properties for quality attributes including for intermediate and final products.