THE MANGROVE EPIGENOME (MangroveENCODE) PROJECT OF THE FUCOBI FOUNDATION OF ECUADOR: A ONE HEALTH APPROACH TO CONSERVATION OF HEALTHY MANGROVES AND WETLANDS, TO PRODUCE HEALTHY SHELLFISH AND FISH, TO PROTECT PUBLIC HEALTH LONG-TERM

Miriam Alcivar-Arteaga, Iris Hernandez, Mayra Galindo, Gober Asunción, Jorge Romero, Pedro Andrade, Gladys Zuniga, Christian Saltos, Sofía Figueroa, Daniela Espinoza, Freddy Aveiga, Fernando Aveiga-Alcivar, Caroline Acacia Warren, Jennifer Ninghuiyi Warren, Diana Villota, Diana Calvache, Jimmy Alcivar, Christian Alcivar, Andres Aveiga, Benjamin Hall, Brenna Kelley, Pedro Alcivar-Marcillo, Oscar Jaen, Genesis Solórzano, Flavio Barros, Cesar Valarezo, Diego Alejandro, Andrea Alejandro, Karina Alejandro, Acacia Alcivar-Warren

Programa "UNA SALUD / ONE HEALTH Epigenomics and Microbiomes:
Somos lo que comemos / We are what we eat"
Fundación para la Conservación de la Biodiversidad Acuática y Terrestre (FUCOBI) Quito, Ecuador. www.fucobi.org
fucobi@gmail.com

The long-term goal of the MangroveENCODE project of the FUCOBI Foundation of Ecuador is to help conserve healthy mangroves and tidal wetlands ecosystems through education and research, by (1) promoting replanting of new trees to address both the community needs and the underlying ecological causes of mangrove degradation; (2) understanding mangrove resilience to climate change by studying their genomes and epigenomes, including transposable elements (TEs), and (3) educate about wastewater-based epidemiology and association of antimicrobial resistance (AMR) and contaminants of concerns (COCs) in emerging resistant pathogens of public health concern. The short-term goal is to examine the interactions between greenhouse gas fluxes and carbon sequestration (blue carbon) and microbial communities (microbiome) with AMR and COCs such as endocrine disrupting chemicals (EDCs) like heavy metals, biocides, pesticides, glyphosate-based herbicides, microbial transgene *Bacillus thuringiensis*, *Vibrio* sp., metals chelated by glyphosate, bisphenol A (BPA), microplastics, bis(2-ethylhexyl) phthalate (DEPH), and per- and poly-fluoroalkyl substances (PFAS), organophosphates, COVID-19 disinfectants, and persistent organic pollutants (PCBs, PAHs) in mangrove sediment, considering adaptation to climate change and environmental degradation-related health issues.

Baseline information is being obtained for future studies to test mechanism-driven hypotheses to examine the transgenerational epigenetic inheritance mechanisms involved in the interactions of CO2 with EDCs and the microbiome of mangrove sediment/agricultural soil, using ecological, toxicological, 'omics' technologies, and computational tools. Preliminary results will be presented about (a) in-depth review of the scientific literature using NCBI databases about mangroves genomes and transcriptomes, genetic variation, AMR, EDCs, TEs like Gypsy LTR retrotransposons and epigenetic components [DNA and histone methylation, non-coding RNAs (miRNA, siRNA, lncRNA)] involved in salt and temperature stress adaptation of mangroves to global change; (b) protocols to collect 1-meter sediment cores for CO2 and EDCs analyses; and (c) metal concentrations in mangrove sediment, shellfish and people from estuaries of Ecuador.