# **The systemic biological effects of sound & their potential application for early screening and treatment modalities for systemic conditions.**

## Introduction

The observable effects of sound on human conditions [1] and plant biology [2]–[5] are well established in the literature. Linguistic sound composition has been used as a diagnostic tool to provide early screening for hearing loss (R) in addition to ultrasound. Early “Sonogenetics” research show that at least two mechanosensitive proteins act in parallel to generate C. elegans behavioral responses to ultrasound stimuli [6]. Salk Institute and others researchers have suggest that ultrasound can be used to control mammalian cells [7], [8].

Discuss the sound work on neurological disorders AD specifically and their temporary effects on AD

Discuss the paper findings on AD CLD and systemic and AD is a systemic disease [9]

However, little work has been done to truly understand how interpreting the systemic effects of sound, on biological system, can be used for early screening and treatment of systemic conditions such as late-onset Alzheimer’s Disease (AD).

Early work is needed to guide other researchers to ensure system dynamic are considered when studying biological pathways.

Longitudinal simulation validated with observational progression data

However, many other confounding factors play an important role in the adoption of healthy foods to prevent disease. Community engagement and cultural influence are critical factors in the sustainability of healthy dietary patterns. Food macronutrients and micronutrients can also play an important role in treatment of disease, in some cases even reversing the harmful effects that led to the development of the disease. However, systemic complexity of system dynamics when developing strategies for healthy community-based food systems can be overwhelming in terms of complexity.

The current study intends to address this complexity by developing an integrated modeling framework. The purpose of this framework is to use it to identify both population & individual level interventions, and then composition of a wholistic strategy that can be deployed and managed in a sustainable fashion by its beneficiaries. To accomplish this, the effort will be divided into 3 sub-projects each with individual aims & objectives to measure progress and adapt future work. In the first and foundation project, we plan to develop an integrated region/culturally specific whole food/agriculture database in combination with a mobile application. The application will be used to engage citizen scientist in sharing and curating healthy receipts that others can discover based on variables associated with an individual health profile. The benefit of this work lies in the development of a unique integration of system dynamic modeling techniques that facilitate the medical value of food micronutrients and composition of individualized recommendations. Application use will further drive both research and the refinement of algorithms to discover better individualized dietary pattern fits to further support engagement.