This project, conducted in collaboration with Bnai Zion Medical Center, addresses a critical issue frequently encountered in hospital and medical center laboratories: the mismanagement of patient samples.

In the current system, patient samples are labeled with barcode stickers containing essential patient information, such as names and identification numbers. Upon arrival at the laboratory, staff are responsible for matching these samples with the corresponding patient details in the computer system. Each sample is typically assigned a label that includes the patient’s name or ID, along with a unique barcode linked to the patient.

Challenges arise when multiple samples from the same or different patients are processed simultaneously. Manual handling and labeling increase the risk of confusion, which may result in sample mix-ups. To mitigate these risks, it is crucial to ensure that samples are accurately identified at every stage, confirming they belong to the correct patient and are intended for the appropriate laboratory procedures.

To address these challenges, the project involves the development of a low-cost, reliable barcode checker device. This device is designed to verify that each sample labeled with patient information is correctly matched to its corresponding "Golden Barcode," thereby reducing the likelihood of misidentification or errors throughout the process.