Hepatitis C is a viral disease caused by the Hepatitis C Virus (HCV) that, in its chronic form, can lead to severe liver damage, liver cancer, and in some cases death. The infection rate of HCV in China remains high, especially in rural and low-income communities, primarily among drug users and blood transfusion recipients. Current detection methods for HCV primarily include blood tests performed in labs or at hospitals and clinics. They are often inefficient and expensive, in some cases taking up to 17 days for test results to become available. Due to these issues, as well as the often asymptomatic nature of HCV, the virus often goes undetected until damage to the liver is irreversible. Our objective is to use synthetic biology to create a cost-effective, at-home HCV detection system using HCV RNA biomarkers present in the saliva of those infected with chronic HCV. By creating an at-home detection system using a molecular beacon that binds to the target HCV RNA sequence, those living in high-risk areas would easily be able to test themselves for HCV, even in its early stages, helping prevent HCV-caused liver diseases and deaths.