Development of preventive vaccines against hepatitis C virus (HCV) remains one of the main strategies in achieving global control of the disease. In this report, we describe the development of a novel immunopotentiating and delivery system aimed at improving the efficacy of HCV vaccines. The system utilizes a combination of synthetic polymers and delivery vehicles that exhibit spontaneous self-assembly behavior, while maintaining their robust immunopotentiating and delivery capabilities. This approach offers a promising new avenue for the development of highly effective HCV vaccines.