May 20th, 12:30 PM

Rational Design of an Epitope-Based Hepatitis C Virus Vaccine

Brian G. Pierce  
*University of Maryland*

Elisabeth N. Boucher  
*University of Massachusetts Medical School*

Ejemel Monir  
*University of Massachusetts Medical School*

*See next page for additional authors*

Follow this and additional works at: [https://escholarship.umassmed.edu/cts_retreat](https://escholarship.umassmed.edu/cts_retreat)

Part of the *Immunology of Infectious Disease Commons, Immunoprophylaxis and Therapy Commons, Structural Biology Commons*, and the *Virus Diseases Commons*

---

Pierce, Brian G.; Boucher, Elisabeth N.; Monir, Ejemel; Thomas, William D.; Weng, Zhiping; and Wang, Yan, "Rational Design of an Epitope-Based Hepatitis C Virus Vaccine" (2016). *UMass Center for Clinical and Translational Science Research Retreat*. 66.  
[https://escholarship.umassmed.edu/cts_retreat/2016/posters/66](https://escholarship.umassmed.edu/cts_retreat/2016/posters/66)

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in UMass Center for Clinical and Translational Science Research Retreat by an authorized administrator of eScholarship@UMMS. For more information, please contact Lisa.Palmer@umassmed.edu.
Presenter Information
Brian G. Pierce, Elisabeth N. Boucher, Ejemel Monir, William D. Thomas, Zhiping Weng, and Yan Wang

Keywords
Hepatitis C, vaccines, epitopes

Creative Commons License
This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 License.

This poster abstract is available at eScholarship@UMMS: https://escholarship.umassmed.edu/cts_retreat/2016/posters/66
Rational Design of an Epitope-Based Hepatitis C Virus Vaccine

Brian G. Pierce, PhD1*, Elisabeth Boucher, BS2, Monir Ejemel, BS2, William D Thomas Jr, PhD2, Zhiping Weng, PhD3* and Yang Wang, MD PhD2*

1University of Maryland Institute for Bioscience and Biotechnology Research, Rockville, MD
2MassBiologics, University of Massachusetts Medical School, Boston, MA
3Program in Bioinformatics and Integrative Biology, University of Massachusetts Medical School, Worcester, MA

#Co-corresponding authors and Co-PIs for NHMPP award

Despite improving treatment methods and therapeutic options, hepatitis C virus (HCV) remains a major global disease burden, and a vaccine would help greatly in reducing its incidence. Due to its extremely high sequence variability, HCV can readily escape the immune response, thus a vaccine must elicit an immune response toward conserved, functionally important epitopes.

Using structural data of the broadly neutralizing antibody HCV1 in complex with a conserved linear epitope from the HCV E2 protein (aa 412-423, referred to as epitope I or domain E), we performed structure-based design to generate vaccine immunogens to induce antibody responses to this epitope. Designs selected for immunological characterization included a stabilized minimal epitope structure based on a defensin protein, as well as a bivalent vaccine featuring two copies of epitope I on the E2 surface. In vivo studies confirmed that these designs successfully generated robust antibody responses to this epitope, and sera from vaccinated mice neutralized HCV. In addition to presenting several effective HCV vaccine immunogens, this study demonstrates that induction of neutralizing anti-HCV antibodies is possible using an epitope-based vaccine, providing the basis for further efforts in structure-based vaccine design to target this and other critical epitopes of HCV.