



Medical Education and Research Grant Outcome Report

Name: Novel Therapies Against Influenza Infection

Principal Investigator: Stacey Schultz-Cherry, PhD, Assistant Professor

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Department: Medical Microbiology and Immunology

Program: New Investigator Program

Grant Duration: 08-01-05 to 07-31-07 (24 months)

Expenditures: \$100,000 (100%)

Use of Funds (Taxonomy): Basic Science

Research Keywords: influenza; protection; population health; antiviral therapy

► **Description:** Two of limitations to the existing “Flu Vaccine” are that the vaccine does not work effectively in high-risk groups, such as the elderly, and the virus changes every year, requiring the development of new vaccines annually. Blocking viral replication with novel antiviral peptides that attack all strains of influenza virus may be a way to address those limitations. The goals of this project are to understand how antiviral peptides regulate viral growth, and how these peptides may be used in preventing and treating influenza infection in young and aged animal models.

► **Contributions/Results:** These are the first studies known to identify a novel peptide that not only inhibits viral entry in vitro that could be used as both a therapeutic against influenza viruses.

The purpose of this study was to apply knowledge of influenza pathogenesis to the prevention and treatment of influenza during epidemics and pandemics, especially in the elderly. The objective of the study was to understand how the peptide blocked influenza virus and determine the optimal use of the peptides against influenza infection in young and aged animal models. The investigator demonstrated that the EB peptide prevented the virus from attaching to cells by binding directly to the influenza virus hemagglutinin (HA) protein. Therapeutically, the study demonstrated that the EB peptide effectively prevented infection when administered with the virus. Additionally, administration of the peptide 24 hours after infection also afforded protection from viral infection.

► **Met Objectives:** Project completed

► **Timeline for Application of Results:** Unknown

► **New partnerships or collaborations:** This project laid the foundation for several new avenues of research.

The investigator plans to pursue funding to continue these studies; specifically characterizing the interaction of EB with the viral HA protein, and defining the use of EB as a vaccine adjuvant. This will be accomplished through collaborations both on campus (Departments of Chemistry and Pathobiological Sciences) and with the CDC (Leah Luna), WHO (Martin Friede), and the Center for Biomolecular Sciences at the University of St. Andrews (Rupert Russell).

► **Contributions to the Transformation:** This project afforded new collaborations and teaching opportunities; specifically discussing influenza drugs and vaccine strategies.

► **Matched Dollars (cash or in-kind):** \$0

► **Dissemination:** Publications: The work was published in the Journal of Virology and discussed in an invited review in Future Virology. A second manuscript is in preparation describing the mechanism of action (for submission to Journal of Virology) and we predict a third publication on the adjuvant activity of the peptide will be submitted in the spring.

Presentations: The work was presented at numerous meeting worldwide including the World Health Organization, FDA, the Pasteur Institute, and other local and international meetings. The work was also presented at a “Wednesday Night at the Lab” meeting.

Public Outreach: Findings were highlighted in an article by the University of Wisconsin-Madison News (<http://www.news.wisc.edu/12983>) and then received international coverage from the associated press (October 2006).

► **Additional Funding:** None reported to date. Application to continue these studies through American Lung Association and the Gates Foundation.