



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Erik W. Toh	Project Number S1426
Project Title Antiviral Activities of Phyllanthus niruri and Phyllanthus urinaria: Treating Hepatitis B with Herbal Medicine	
Abstract Objectives/Goals Hepatitis B is one of the major diseases inflicting the human population. Conventional treatment with interferon-alpha is very expensive and has many serious side effects. Alternative herbal medicine using extracts of Phyllanthus niruri (amarus) and Phyllanthus urinaria has been reported to be effective against hepatitis B and other viral infections. The purpose of this study is to quantitatively determine the antiviral effect of these herbs in a well defined in vitro system. Methods/Materials Antiviral activity induced by the herbal extract was measured as inhibition of the cytopathic effect (CPE) which normally results from infection of untreated MDBK cells with vesicular stomatitis virus (VSV). Aqueous extract of P. urinaria (prepared from dried herbs) and P. niruri were serially titrated and their activities were compared to a positive control, interferon-alpha2b. Results Pretreatment of MDBK cells with interferon-alpha2b, as expected, inhibited the CPE from VSV infection dose-dependently. The extract of P. niruri produced a concentration-dependent antiviral activity at dilutions 1:2560 to 1:160. Maximal activity (70% inhibition of CPE) was found at 1:160 dilution. The extract of P. urinaria was less effective; the highest tolerable concentration (1:80 dilution) produced a 28% inhibition of CPE. Conclusions/Discussion A cell-based assay has been developed to examine the antiviral effect of herbal extracts from the genus Phyllanthus. Aqueous extracts of P. niruri and P. urinaria protect MDBK cells from viral infection. In addition, they do not display cytotoxicity in uninfected normal cells. These findings support clinical studies by others that regular intake of these herbal supplements may be beneficial for chronic hepatitis B patients.	
Summary Statement The aqueous extract of Phyllanthus niruri and Phyllanthus urinaria inhibits the cytopathic effect (CPE) that results from infection of MDBK cells with vesicular stomatitis virus (VSV).	
Help Received Used cell culture reagents and lab facilities at Phage Biotechnology Corp (Tustin, CA) under the supervision of Dr. Wu. Father purchased Chanca Piedra (aqueous extract of P. niruri; Raintree Nutrition, TX) and dried bulk P. urinaria (Tropilab, Suriname).	