

## Research Demonstrates that HerbalScience's Proprietary Elderberry Extract Prevents in Vitro H1N1 Influenza Infection

- Laboratory Results Documenting the Elderberry Extract's Antiviral Mode-of-Action Published in Recent Issue of Scientific Journal *Phytochemistry* -

NAPLES, Fla., Sept. 10 /PRNewswire/ -- A recent research study has given new scientific evidence to the long-held empirical belief that elderberries possess antiviral activities. The research involved a specific, reproducible elderberry extract developed by HerbalScience Group LLC, and succeeded in identifying key chemical components of the extract that inhibited in vitro infection and were shown to bind directly to Human Influenza A (H1N1) virus particles. The binding blocked the ability of the viruses to enter host cells, and thereby effectively preventing H1N1 infection in vitro.

An article detailing the study, titled "Elderberry flavonoids bind to and prevent H1N1 infection *in vitro*," has been published in the peer-review scientific journal *Phytochemistry*. The article's authors are scientists affiliated with HerbalScience Group, a Naples, Florida, and Singapore-based company dedicated to applying advanced science and technology to the production of botanical drugs and nutraceuticals, and with the University of Miami Leonard M. Miller School of Medicine, Miami, Florida.

The research results are notable not only because they identified and characterized two specific flavonoids (plant nutrients that are beneficial to health) that are the major contributors to the anti-influenza activity of the elderberry extract, but also verified how the flavonoids provide that benefit, via direct binding to H1N1 virus particles and blocking the virus from infecting host cells.

"Our studies on HerbalScience's proprietary elderberry extract have enabled us to identify the key bioactives that contribute to its antiviral activity, and begin to understand how the mixture of natural chemistries present in elderberry functions," said Randall S. Alberte, Ph.D., Chief Scientific Officer of HerbalScience Group and one of the authors of the published study. "Using methods, technologies, and procedures that are standard in the pharmaceutical industry and new technologies developed by us, we were able to demonstrate the effectiveness of the elderberry extract in inhibiting viral entry into target cells and effectively blocking its ability to reproduce."

Central to the research was the use of a DART (Direct Analysis in Real Time) Time-of-Flight mass spectrometer, one of the most advanced mass spectrometric technologies available, and which is able to detect, identify with high accuracy, and quantify the hundreds or thousands of individual chemicals present in botanical extracts. When this technology is combined with the use of HerbalScience's Platform Technology, this information can be used with other data to rapidly identify the key bioactives present.

The elderberry extract used in the study is the result of technology developed by HerbalScience that enables the company to standardize the chemical profile of any selected botanical in order to deliver a compositionally and functionally consistent product that is effective and safe. The patented technology was developed for the company by top researchers in the areas of botanical and natural products chemistry and plant biology, as well as leading experts in supercritical CO<sub>2</sub> and affinity absorbent extraction technologies, methods used for extracting plant phytochemicals.

The company's proprietary and environmentally-friendly technology is able to extract a broad diversity of phytochemicals from botanicals and produce a consistent and reliable chemical "fingerprint" for each and every dose. HerbalScience scientists also developed a process that enables the beneficial chemical compounds in botanicals to be enhanced while removing any harmful compounds like heavy metals and pesticides. With the application of this technology to elderberry, the company achieves a consistent chemical profile in its extract with batch-to-batch and dose-to-dose reliability, and maintains the natural synergy of the chemical make-up while optimizing the efficacy of its health benefits.

The article detailing this study is in the July 2009 issue of the peer-reviewed scientific journal *Phytochemistry* (Volume 70, Issue 10). Its authors are Bill Roschek, Jr., Ryan C. Fink, Matthew D. McMichael, Dan Li, and Randall S. Alberte. Dr. Fink is with the Department of Biochemistry and Molecular Biology, University of Miami Leonard Miller School of Medicine, Miami, Florida, and the other authors are affiliated with HerbalScience Group LLC. Dr. Li is the Chief Scientific Officer of HerbalScience Singapore.

HerbalScience Group is a privately-held life sciences company headquartered in Naples, Florida, with facilities in Singapore. HerbalScience is engaged in the discovery, development, manufacture, and marketing of proprietary

botanical compounds for human health in the U.S. and international markets. The company has prominent alliances with prestigious university laboratories and prominent researchers in the U.S., as well as research institutions in China.

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