

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

HARVEST TRADING GROUP, INC.

Petitioner

v.

VIREO SYSTEMS, INC. AND

UNEMED CORPORATION

Patent Owner

U.S. PATENT NO. 8,962,685

DECLARATION OF RICHARD B. VAN BREEMEN

Case IPR: Unassigned

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I, Richard B. van Breemen, Ph.D., hereby declare and say:

1. I have been retained by counsel for Petitioner, Harvest Trading Group, Inc., to provide an expert declaration in support of Petitioner's Inter Partes Review of claims 1-20 of U.S. Patent No. 8,962,685 (the "685 Patent"; Ex. 1001).

I. Professional Background

2. I am an expert in medicinal chemistry particularly as it relates to dietary supplements. I have extensive experience isolating and analyzing natural compounds, and determining such compounds' efficacy when administered.

3. I hold a B.A. degree in Chemistry from Oberlin College (1980) and a Ph.D. in Pharmacology from the Johns Hopkins University School of Medicine (1985).

4. I have been consistently employed as a research scientist and professor of chemistry and medicinal chemistry since obtaining my Ph.D. I am currently a Professor of Medicinal Chemistry and Pharmacognosy at the University of Chicago College of Pharmacy, a position I attained in 2000. Since 2010, I have been the Director of the Mass Spectrometry, Metabolomics, and Proteomics Facility at the University of Illinois Cancer Center ("UIC"), Chicago, IL, and in 2011, I was named Director of the UIC/NIH Center for Botanical Dietary Supplements Research at UIC.

5. Since 1999, I have also worked at the UIC/NIH Center for Botanical Dietary Supplements Research (UIC Botanical Center). The UIC Botanical Center focuses on the study of the safety and efficacy of dietary supplements used by women. I was initially a Co-Director at the UIC Botanical Center when it was founded in 1999, and my primary responsibilities were supplement safety and all analytical aspects of supplements, including chemical standardization. Since 2011, I have been the Director of the UIC Botanical Center. In this role, my responsibilities include all aspects of the UIC Botanical Center operation including extraction and standardization of all botanical supplements for study as well as the clinical studies. Since 1999, we have completed three Phase-1 trials and one Phase-2 clinical trial at the UIC Botanical Center.

6. Throughout my career, I have served on various committees and boards related to dietary supplementation safety and efficacy, including the AOAC International Presidential Task Force on Dietary Supplements in 2009-2011, Chair of the AOAC International Dietary Supplements panels on vitamin B6 and vitamin B12 for which I received their Outstanding Dietary Methods Panel Award in 2010. Currently, I am serving as Chair of a AOAC International Stakeholder Panel on Dietary Supplements Working Group addressing methods of analysis of vitamin B12 supplements. Founded by the United States Department of Agriculture, the mission of the AOAC International is to establish official methods

of analysis and standards for agricultural and pharmaceutical products including dietary supplements.

7. I have studied dietary supplements throughout my career, publishing over 300 papers in this field. Notable publications include:

Constantinou AI, Lucas LM, Lantvit D, Hawthorne M, Xu X, Nho CW, Jeffery EH, Christov K, **van Breemen RB**, Pezzuto JM. Soy protein isolate prevents chemically-induced rat mammary tumors. *Pharmaceut. Biol.* 40(Supplement), 24-34 (2002).

Which was cited by the NIH in the Annual Bibliography of Significant Advances in Dietary Supplement Research, 2002 (Ed. by RB Costello and LG Saldanha. NIH Publication No. 04-5450, September 2003);

Overk CR, Yao P, Chadwick LR, Nikolic D, Sun Y, Cuendet MA, Deng Y, Hedayat AS, Pauli GF, Farnsworth NR, **van Breemen RB**, Bolton JL. Comparison of the in vitro estrogenic activities of compounds from hops (*Humulus lupulus*) and red clover (*Trifolium pratense*). *J. Agric. Food Chem.* 53, 6246-6253 (2005).

Which was cited by the NIH in the Annual Bibliography of Significant Advances in Dietary Supplement Research, 2005 (Ed. by RB Costello and LG Saldanha. NIH Publication No. 06-6060, September 2006);

van Breemen RB, Fong HHS, Farnsworth NR. The role of quality assurance and standardization in the safety of botanical dietary supplements. *Chem. Res. Toxicol.* 20, 577-582 (2007);

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