

Univera's Scientific Advantage

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An Honest View

Historically, nutrition has been the stepchild of the biological sciences. When I began my research in the early 1970's, it was part of Home Economics, ridiculed as the Betty Crocker school of Nutrition. Then, in the 1980's, a growing body of research began to change the tone of that discussion, focusing on the critical role that diet and nutrition play in immunity, cardiovascular health, diabetes, cancer and aging.

As the trickle of research grew to a torrent, I was sure that nutrition would take its rightful place as equal in importance to pharmacology. After all, drugs had an important role to play in health care, but it was clear to everyone that the keys to *prevention* were to be found in the natural products arena.

And yet, as we entered the 1990's, the nutrition "revolution" was stalling. There were three important reasons for this:

1. Lack of funding. In a profit-oriented system, success is tied to patents. It is easy to obtain patents on synthetic molecules because they are, by definition, unique. Thus, as the pharmaceutical companies amassed thousands of patents, the natural products arena was left behind. From 1985 to 1995, more than 10,000 patents were awarded to the nine largest drug companies, creating the most profitable business in the world.

2. Money buys power and influence. By 1996, according to an ABC News report, "[the] pharmaceutical industry has more registered lobbyists than the number of senators and congressmen combined."

3. Lack of scientific integrity. The natural products industry has been under attack by government and the media and unfortunately, much of the criticism is self-inflicted. I know of no other industry (not even used cars) that is plagued by more exaggeration, hype and outright lies. As a matter of safety and scientific integrity, the biomedical community must hold everyone accountable, in every field. Natural product research must be conducted to validate its safety and utility. In my academic career at two Southern California universities, I was at odds with both sides of the health care spectrum: I would plead with the biomedical departments to look at the wisdom inherent in centuries of medicinal plant use; and at the same

time, I would challenge natural product advocates to support their claims with reliable science.

The Problem: Reliable Science is Expensive

We must remember that, in addition to record profits, the pharmaceutical industry has enjoyed another source of funding. The National Institutes of Health (NIH) spends more than \$20 billion annually on research. A 1995 report by that agency looked at the five top-selling drugs and found that "NIH-funded research played a critical role" in developing each one.

The Solution: ECONET Provides a Resource Base to Progress Nutritional Research

Without massive profits or taxpayer dollars, the natural products industry would need a philanthropist. Enter Bill Lee, a South Korean business leader who had purchased a Texas aloe plantation in 1988. From 1988 to 1995, the Lee family funded more than \$4 million in university research on aloe vera alone. In 1996, Mr. Lee started his own laboratory (known as Unigen) and poured another \$20 million into medicinal plant research. When I met Bill Lee in 1997, he explained his business plan: to set the bar for the natural products industry by utilizing advanced technologies—technologies then available only to pharmaceutical companies and large universities. To my amazement, all this would unfold in less than a decade.

Milestones

1997:

* Medicinal plant collection and analysis begins with 500 species from China and India.

* Unigen is awarded US patent for its novel use of Polymerase Chain Reaction (PCR) analysis of aloe vera.

1998:

* LCMS and GCMS technologies are added to Unigen's biological and biochemical capabilities.

* Univera is incorporated to distribute products developed by Unigen research.

* Bill Lee purchases an option on more than 140,000 acres in Southern Siberia, including a 100,000 acre botanical preserve.

* Unigen develops MaxCell, a botanical extract to enhance nutrient bioavailability. In vivo data shows 300% increase in CoQ10 bioavailability (US patent #6,395,311).

1999:

* Phytologix™ research platform is developed with high throughput analysis of more than 1,000 medicinal plants.

* Unigen researchers publish detailed in vivo analysis of aloe metabolism (Yagi).

* Univera launches MetaBerry™, the first high-potency antioxidant beverage combining concentrates of blueberry, cranberry, black cherry and concord grape in an aloe delivery system. ORAC score: 2,000 per fluid ounce.

* Univera launches Prime™ combining DHEA, 7-Keto, DIM, alpha lipoic acid, acetyl-L-carnitine, N-acetylcysteine, goji concentrate, B12, B6 and methylcobalamin.

2000:

* Unigen and Univera scientists present the research foundation for the metabolic model of aging (Jia, 2000).

* Unigen scientists identify the immune-modulatory “sweet spots” among thousands of aloe polysaccharides (Qiu, 2000).

* Phytologix™ library expands to include 2,000 plants from four climate zones.

2001:

* Unigen adds genomics technology with 96-well plate capabilities, becoming the first natural product R&D facility utilizing full-scale genomics.

* Unigen scientists document age-related decline in tissue repair, measured by urinary metabolites (Jia 2001).

* Patent issued for this discovery on age-related decline of tissue repair (US Patent# 6,326,209).

* Univera adds alpha lipoic acid to MetaBerry and increases ORAC score to 3000 per fluid ounce.

2002:

* Phytologix plant library expands to 3,000 plants and 20,000 fractions.

* First US Patent filed for a defined combination of scutellaria baicalensis and acacia catechu (US Patent# 10,091,362).

* Unigen creates Protectin™, a standardized extract of scutellaria baicalensis and acacia catechu.

* Univera launches Ageless™ capsules, combining ornithine alpha-ketoglutarate, B6, panax ginseng, eleuthero, rhodiola, green tea, Protectin™ and MaxCell™.

2003:

* *The Metabolic Plan* is published by Random House, finalizing the Metabolic Model of Aging and coordinating Unigen research with Univera product development.

* Discovery of Protectin was published in *Studies in Natural Product Chemistry* (Jia, 2003).

* Unigen authors its first paper confirming in vivo anti-cancer activity of orally-administered Scutellaria baicalensis (Zhang, 2003).

* Univera combines Ageless capsules and MetaBerry to create AgelessXtra™. AgelessXtra™ achieves antioxidant potency of 4,500 ORAC per fluid ounce.

* Univera launches RegeniCare™, combining Protectin, glucosamine, chondroitin, MSM and CMO.

2004:

* ECONET incorporated to coordinate operations of all Lee entities, including agriculture, research, manufacturing and distribution.

* Unigen Genomics program expands to include microarray capability, allowing for the screening of up to 1,500 genes at once.

* Bill Lee becomes the world's leading supplier of scutellaria, planting more than 2,000 acres.

* ECONET files a record number of patents (42) in eight areas of natural products research.

2005:

* Lee purchases 1,200 acres on Hainan Island, China for aloe plantation, including five miles of beachfront on the South China Sea for a holistic health spa.

* US Patent issued for antioxidant activity in aloe chromones (US Patent# 6,884,783).

2006:

* Phytologix library expands to 6,000 plants and 100,000 fractions.

* US Patent issued for the use of acacia catechu to reduce COX/LOX- mediated tissue damage (US Patent# 7,108,863).

* Unigen publishes a method to quantify organic solvent residues in dietary supplements in the *Journal of AOAC International* (Lee-Jeong, 2006).

* Univera launches Essentials™, a comprehensive meal replacement utilizing unprecedented food science:

- A. Nanotechnology to create water soluble essential fatty acids (from cranberry seeds)
- B. Ultrafiltration and enzyme hydrolysis to reduce protein molecules to di- and tri-peptides
- C. Non-gelling soluble fiber
- D. Minerals from whole food concentrates

2007:

* Publication of pivotal efficacy paper for Protectin™ in the *Journal of Medicinal Food* (Burnett 2007).

* Publication of Protectin™ safety study in the *Journal of Food Biochemistry* (Burnett 2007).

* Patent awarded for the activity of free-B-ring flavonoids to support joint repair (US Patent# 7,192,611).

* Univera launches RegeniFree™, combining Protectin™ and a standardized high-potency extract of curcumin.

* Stephen Cherniske officially becomes “best-selling” author with more than one million copies in print.

2008:

* Unigen installs Nuclear Magnetic Resonance (NMR) laboratory.

* 90,000 sq ft Hainan aloe processing plant goes on line.

* Unigen publishes two articles disclosing the discovery of a novel skin care ingredient for skin aging and dark spots (Nesterov, 2008).

* The pre-clinical and clinical studies of Unigen's novel insulin sensitizer, Loesyn, are presented at the International Conference of Natural Product Research (Yimam & Devaraji, 2008).

2009:

*Unigen combines operations in Korea, USA and Russia to become a globalized natural product research institute.

*Protectin™ patents are issued in USA (Patent #7514469), Europe (EP1503778), Australia (#2003228777), China (ZL03809821), and Russia (#2379031).

*The effects of Protectin actives on down regulation of gene and protein expressions of pro-inflammatory cytokines are published in the *British Journal of Pharmacology* (Altavilla, 2009).

* The human clinical effects of Protectin actives (Flavocoxid) are published in the *Journal of Nutrition Research* (Levy, 2009).

* The human clinical safety of Protectin actives are published in *the Journal of Medicinal Foods* (Morgan, 2009).

*Unigen NMR lab methods are validated and approved for certification by the International Aloe Science Council.

* Unigen's aloe certification methods are published in the *Journal of AOAC INTERNATIONAL* (Jiao, 2009).

2010:

* Post marketing, multiple-center human clinical study of Protectin actives (Flavocoxid) is published in *Current Medical Research and Opinion* (Pillai, 2010).

* Sub-chronic toxicity study of Protectin™ is published in the *Journal of Food and Chemical Toxicology* (Yimam 2010).

*Unigen obtains US patent for Lasoperin (US#7695743) (a proprietary formulation including Protectin™) for supporting mental health.

*Unigen obtains US patent for Loesyn (US Patent# 7678772), an Aloe-based ingredient to improve insulin sensitivity.

*Unigen's skin whitening and anti-aging ingredient, Nivitol, launches globally in Clinique's *Even Better Clinical Dark Spot Corrector*.

*Skin whitening and anti-aging claims of Nivitol are allowed by United States Patent and Trademark Office.

Conclusion

Today, ECONET comprises one of the largest and best-equipped natural products R&D operations in the world, coordinating research activities with:

- * Georgetown University
- * Baylor University
- * University of California, Irvine
- * University of California, Davis
- * University of Illinois
- * University of Wisconsin

* ECONET laboratories span over 100,000 sq ft of active research space, operating full-scale genomics, proteomics, biological, biochemical, organic synthesis, quality control and PNMR facilities.

* ECONET labs are operated by over 50 full-time scientists and PhD's with expertise in biochemistry, botany, analytical chemistry, cell biology, molecular biology (plant and animal), human nutrition, pre-clinical and clinical research, organic synthesis and process development.

* The Phytologix library now contains over 12,000 plants and 300,000 fractions. New plants are added at a rate of approximately 1,000 specimens every year.

* Between 1998 and 2010, Unigen has presented research at esteemed science conferences including the American Academy of Cancer Research, the American Society of Pharmacognosy, the International Conference on the Science of Botanicals, the American Diabetes Association, and the Colgate Technology Conference. Because of the clinical nature of these of publications, the poster presentations for these events are available on the clinical side of UniveraScience.com, under *Poster Presentations*.

* Over 195 patents have been awarded or pending.

*ECONET scientists have had over 20 research reports published in peer-reviewed science or medical publications.

* There are currently more than 7,000 acres of agricultural land under cultivation, with farms and fields in the US, Mexico, Russia, China and South Korea. There are agricultural operations in every climate zone, including a 100,000 acre botanical preserve.

* ECONET agricultural division now produces more than 30% of the world's raw material aloe.

To Learn More:

Univera provides a comprehensive website for technical and clinical information. Visit www.univerascience.com to view technical data on each of our 33 products. A complete list of patents and trademarks is also available, along with FAQ's, information on our product development and agricultural processes, and a library of white papers, articles and essays.

All are welcomed to access the public side of the site. You'll find a convenient search function and index features to help you locate the information you desire. The clinical side, however, is available to LICENSED HEALTH PROFESSIONALS ONLY. Upon registering for a free login account, licensed professionals will receive an access code for the clinical site.

A licensed health professional is defined as a health professional who is licensed by the state where they practice. These include MD, DC, DDS, RN or NP licenses. In addition, most states license Registered Dietitians (RD), Acupuncturists (LAC), Naturopaths (ND), and Physical Therapists (PT). In general, any state licensed health professional who treats patients will fall into this category.

What about *certified* health professionals such as nutritionists, herbalists and massage therapists? According to the FDA, these health care professionals see *clients*, and do not have a doctor/ patient relationship. Because the FDA acknowledges that primary health care providers need clinical information in order to give the best care to their patients, we abide by this distinction & have thus delineated public and clinical domains within univerascience.com. Importantly, biomedical education is the primary intention of Univera in creating this web site. Clinical information is for EDUCATIONAL PURPOSES ONLY and may not be used to promote Univera products.

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