

**2009 North American Enhanced Nanodrug Therapeutic Systems
Excellence in Healthcare Technology Innovation of the Year Award****Aphios Corporation**

The 2009 Frost & Sullivan North American Excellence in Healthcare Technology Innovation of the Year Award in the field of Enhanced Nanodrug Therapeutic Systems is presented to Aphios Corporation for developing the SuperFluids™ nanodrug solubility, encapsulation and delivery platforms. These platforms are unique in that they create dense phase super solvents with superior thermodynamic properties, allowing them to formulate and deliver drugs to targets that are not resolvable through conventional means.

Company Background

Founded in 1993 by Trevor Castor, Aphios Corporation's primary goal was to pursue virus inactivation. In order to achieve this objective, the company developed a technology to disrupt viral particles through the application of SuperFluids™. Under Dr. Castor's visionary leadership, the company serendipitously realized that by reverse engineering the technology to disrupt viral particles they could now create nanoparticles that can be suitably employed for drug solubilization and delivery. Over the years, the strategic direction of the company has evolved from being a company focused on viral therapeutics to an organization that focuses on related technology diversification across drug solubility and delivery, thereby expanding the scope for innovative therapeutic administration.

Technology Relevance in the Market Place

There are two fundamental challenges in the fields of vaccine and therapeutic development and administration. Oral delivery of protein macromolecules is the Holy Grail in biotechnology medicine since proteins and peptides are digested by enzymes and acids before reaching the circulation system. Similar degradation occurs with subunit protein, DNA or inactivated vaccine antigens that are degraded before eliciting a proper immune response. Effective nanoencapsulation affords the luxury of both protecting and releasing the biologic therapeutic or vaccine antigen in a controlled manner to maximize their therapeutic efficacy. Similar challenges reside with hydrophobic cancer therapeutics administered intravenously - nanoencapsulation both

reduces toxicity and increases efficacy, contributing to improvements in therapeutic index and quality-of-life.

How the Technology Works

Aphios Corporation's SuperFluids™ based nanodrug solubility and delivery platforms, including the CFI, CFN, PNP, and PNS, address the challenge posed by existing drug formulation and delivery technologies through creating an environment that effectively offers high solubility and sustained drug delivery through a strong focus on process reengineering of the core SuperFluids™ platform.

The operational principle underlying the foundation of these platforms, the SuperFluids™ technology, is based on the properties of certain gases, such as carbon dioxide, at supercritical conditions wherein they become dense phase fluids with enhanced properties of solvation, selection, penetration, and expansion. In addition to acquiring new properties, the SuperFluids™ retain their gaseous properties of diffusivity and viscosity which enhances transfer rates and reduces processing times. As a consequence of liquid-like density, solubility is highly enhanced providing an ideal environment for therapeutic encapsulation and delivery.

Innovative Features

In spite of the diversified applications of each of the technology platforms ranging from drug formulation to delivery, the platforms gain an advantage over existing therapies in that, owing to the peculiar nature of the underlying principle of SuperFluids™ technology, it becomes possible to retain viral peptides and coats without carrying the infective components at one end as exemplified by the CFI platform. In another instance, the SuperFluids™ platform becomes the basis for the development of phospholipid nanosomes and nanospheres for solubilization, encapsulation and delivery. The breadth of application of a single platform across end-to-end solutions ranging from drug formulation, to vaccination, to delivery is an important aspect that is hard to come by in companies with similar backgrounds making this technology a leader in the therapeutics space.

Best Practices

During the development of these technology platforms, Aphios Corporation has secured over 30 global patents for diverse applications ranging from the core technology to the viral inactivation process. Through an active related diversification strategy, Aphios Corporation has expanded the capabilities of the SuperFluids™ technology via reverse engineering which has really helped the company enhance its product portfolio.

Furthermore, Aphios Corporation has established its presence in the nanodrug formulations and therapeutics space through active collaborations with internationally respected institutions including the National Institutes of Health, Boston University Medical School for prostate cancer and HIV, and with pharmaceutical and biotechnology companies in Japan and the United States for the development of protein and siRNA therapeutics. In addition, Aphios Corporation has been consistently successful in obtaining grants from well respected funding agencies such as the SBIR, NIH towards expanding and developing the applications of its core platform in therapeutic formulation and delivery.

In addition to cultivating strong partnerships and best-in-class product diversification, Aphios Corporation has expanded its capabilities to provide both forward and backward integration solutions via the development of instrumentation and ongoing applications of core SuperFluids™ toward the development of nutraceuticals and drugs for the Central Nervous System. As a consequence of its innovative culture, Aphios Corporation has received favorable reviews and features in journals such as the Boston Business Journal and the Massachusetts High Tech Journal.

Conclusion

In recognition of the innovation, strategic development, and integration of the SuperFluids™ technology in developing platforms for nanodrug formulation, vaccination, and enhanced natural drug delivery systems, Frost & Sullivan is pleased to present Aphios Corporation with the 2009 North American Excellence in Healthcare Technology Innovation of the Year Award, in the field of enhanced nanodrug therapeutic systems.

Award Description

Frost & Sullivan's Technology Innovation Award is bestowed upon a company (or individual) that has carried out new research, which has resulted in innovation(s) that have or are expected to bring significant contributions to the industry in terms of adoption, change, and competitive posture. This award recognizes the quality and depth of a company's research and development program as well as the vision and risk-taking that enabled it to undertake such an endeavor.

Research Methodology

To choose the award recipient, Frost & Sullivan's analyst team tracks innovation in key hi-tech markets. The selection process includes primary participant interviews and extensive primary and secondary research via the bottom-up approach. The analyst team shortlists candidates based on a set of qualitative and quantitative measurements. The analysts also consider the pace of research and technology innovation, and the significance or potential relevance of the innovation to the overall industry. The ultimate award recipient is chosen after a thorough evaluation of this research.

Measurement Criteria

In addition to the methodology described above, there are specific criteria used to determine the final rankings. The recipient of this award has excelled based on one or more of the following criteria:

- Significance of the innovation(s) in the industry, and across industries (if applicable).
- Potential of the products of innovation(s) to become industry standard(s).
- Competitive advantage of innovation vis-à-vis other related innovations.
- Impact (or potential impact) of innovation(s) on company or industry mind share and/or company bottom line.
- Breadth of intellectual property related to the innovation(s), that is, patents, scientific publications, and papers in peer-reviewed journals.

About Best Practices

Frost & Sullivan Best Practices Awards recognize companies in a variety of regional and global markets for demonstrating outstanding achievement and superior performance in areas such as leadership, technological innovation, customer service, and strategic product development. Industry analysts compare market participants and measure performance through in-depth interviews, analysis, and extensive secondary research in order to identify best practices in the industry.

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