



# Dyadic International, Inc.

## CORPORATE PROFILE March 2007

American Stock Exchange	DIL
Shares Outstanding/Float	26.9/16.1 MM
Share Price (3/1/07)	\$ 5.91
Market Capitalization	\$ 159 MM
Founded	1979
Employees	120
2006 Revenue (Nine Months)	\$ 12.0 MM
Cash & equivalents (9/30/06)	\$ 9.4 MM

### Overview

Dyadic is engaged in the development, manufacture and sale of biological products for applications in biorefining, biosciences and enzymes. DIL's core technologies use proprietary fungal strains to produce enzymes and other biomaterials, principally focused on a system for protein production based on the patented *Chrysosporium lucknowense* fungus, known as C1.

In its biorefineries business, Dyadic is applying its C1 and other technologies to discover, develop and manufacture enzymes to convert DDG (dry distillers grain, the corn mash byproduct from ethanol, widely used as an animal feed) into fermentable sugars. These sugars can be utilized to produce additional ethanol and other chemicals that have historically been petroleum-derived.

Additionally, DIL has demonstrated enzymes to convert other agricultural byproducts, like corn stover, wheat straw and sugar cane bagasse into fermentable sugars that can be used to produce ethanol. Dyadic's R&D programs are focused on developing and manufacturing enzymes that will be more effective in converting these byproducts into larger volumes of lower cost fermentable sugars, lowering the cost of cellulosic ethanol production.

Proceeds of the \$10 million three-year R&D agreement with Abengoa Bioenergy will fund DIL's development of an enzyme production system customized for commercial application in Abengoa Bioenergy's cellulosic ethanol production process. Abengoa, one of the world's largest ethanol producers, recently won a \$76 million grant from the U.S. DOE to design and build a plant to produce ethanol from biomass.

In biosciences, Dyadic is developing its C1 technology to facilitate the discovery, development and large-scale production of human antibodies and other high-value therapeutic proteins. Dyadic's goal is to enable pharmaceutical and biotech companies (and DIL) to successfully make sufficient quantities of promising therapeutic proteins for preclinical and clinical testing, thereby improving prospects for a drug candidate's advancement from discovery through development, accelerating development time and reducing R&D costs. Dyadic may choose to develop drugs from genes the company or its partners identify as potentially useful



and/or manufacture those drugs in commercial quantities at reasonable cost, addressing one of the critical issues facing the biotechnology industry today.

Dyadic also uses its C1 and other technologies to manufacture enzymes for global customers in the textile, pulp & paper and animal feed industries, who use Dyadic's products to enhance their own products or improve production efficiency. Dyadic currently sells more than 45 liquid and dry enzyme products to more than 200 industrial customers in approximately 50 countries, including many products manufactured using the company's patented C1 Host Technology. The company estimates that the potential market for its line of enzymes for the pulp & paper industry alone approaches \$1 billion annually.

Dyadic owns four issued U.S. patents, 27 issued and two allowed international patents and 50 U.S. and international pending patent applications.

### C1 Host Technology

Dyadic's patented C1 Host Technology is a proprietary technology for the production of large or small quantities of enzymes or other proteins based on a fungal strain discovered and developed by Dyadic scientists over the past decade. C1 is a fungal host production organism with superior genetic and fermentation characteristics that Dyadic originally used to manufacture enzymes for the textile industry.

DIL sequenced the C1 genome in 2005, and engaged Scripps Florida to annotate it in 2006. By identifying key metabolic functions that influence expression of genes, annotation is expected to facilitate the use of advanced genetic technologies to extract additional information from the genome sequence. In addition to identifying new commercial targets, this annotated searchable genomic sequence will serve as a blueprint for the C1 host strain and facilitate further development of the technology as a platform for discovery and production of enzymes and other proteins such as antibodies and other high-value therapeutic proteins. Through this effort, Dyadic is increasing its knowledge base about C1 and the way it produces proteins, so that its scientists can program C1 to be more productive, more versatile

and can be used to make more high value new products. The expected benefits include increased yields and lower enzyme cost and an expanded breadth and scope of genes from which C1 can make proteins.

Dyadic's R&D team has specialized knowledge in biotechnology and enzymology, as well as textile and pulp & paper chemistry. The company supplements its internal R&D staff with strategic collaborations with Bio-Technical Resources (U.S.), Moscow State University and the Russian Academy of Sciences (Russia), and TNO Quality of Life (Netherlands). Dyadic's collaborators are renowned for their work in fungal genetics and in the development of cellulases, xylanases and other hemicellulases for converting cellulose into fermentable sugars. Additionally, Dyadic outsources its manufacturing via a long-term agreement with Polfa Tarchomin (Europe) and has been producing enzymes at Martek Biosciences in Kingstree, S.C. (USA) since 1994. Dyadic has operations in the United States of America, Hong Kong and mainland China, Poland and The Netherlands.

#### **Biorefineries Business**

The development of alternative fuels such as cellulosic ethanol can reduce our dependence on imported oil. Dyadic has invested significant resources over the past decade in the development of its C1 and other technologies for the production of cellulases, xylanases and other hemicellulases. Some of these enzymes, as well as others currently in development, may be applicable in the conversion of agricultural waste products such as DDG, corn stover, wheat straw and sugar cane bagasse into fermentable sugars, which in turn can be used to produce ethanol and other chemicals historically derived from petroleum.

#### **Biosciences Business**

Dyadic is developing its technology to deal with the complex issues involved in the production of human therapeutic proteins, including glycosylation, protein degradation and purity. Once fully developed, Dyadic believes that its C1 technology will create a fully integrated expression system that will facilitate the discovery, development and ultimate manufacturing of new and improved protein and enzyme products from a wider range of DNA sources and with better properties than has been possible with other systems. Dyadic also believes that its C1 technology has the potential to allow a single host production organism to be used for discovery, pre-clinical and clinical testing, and commercial production, significantly increasing the efficiency of drug development while reducing costs and time-to-market compared to alternative technologies

available today. In addition to continuing its in-house R&D program, Dyadic seeks to enter into strategic partnerships and collaborations to facilitate the development and adoption of its C1 System.

#### **Enzyme Business**

Dyadic currently uses its C1 Host Technology to produce enzymes and proteins for industrial customers, including several enzymes produced in large quantities in 150,000 liter fermentors.

Cellulases used in textile production and fabric finishing currently represent Dyadic's largest source of revenue. Dyadic recently entered the pulp & paper industry with enzymes for bleach boosting, de-inking, bio-refining and wastewater processing with enzyme products that increase process efficiency, improve quality and reduce energy loads as well as environmental impacts. Sales to the pulp & paper industry increased 63% in the first nine months of 2006. Dyadic estimates that its enzyme products address a \$1 billion segment of the pulp & paper chemicals market. Dyadic also sells specialty enzymes to improve the digestibility of animal feed.

Based on continued development of its C1 technology and other proprietary fungal strains and processes, Dyadic plans to commercialize an even wider variety of new enzymes and proteins with better functional properties and improved cost performance. Dyadic expects to develop these new products both through its own efforts and in collaboration with other companies.

#### **Recent Developments**

Jan. 2007: Joins Royal Nedalco R&D group to develop cellulosic ethanol technologies

Nov. 2006: Closed \$13 million private placement.

Nov. 2006: Closed \$10 million cellulosic ethanol R&D & stock purchase agreement with Abengoa Bioenergy.

Oct. 2006: Granted U.S. patent for novel technology for robotic screening in filamentous fungi.

#### **Scientific Advisory Board**

Dyadic's SAB includes *Dr. Richard Lerner*, President of The Scripps Research Institute; *Dr. Gerald Fink*, a founder of the Whitehead Institute at MIT; and *Dr. Arnold Demain*, Professor of Industrial Microbiology, Emeritus, at MIT. *Fred Frank*, Vice Chairman of Lehman Bros., is also an advisor to the company.

#### **Board of Directors**

Dyadic's Board of Directors includes *Robert Shapiro*, former CEO of Monsanto, *Harry Rosengart*, *Richard Berman*, and *Stephen Warner*, as well as *Glenn Nedwin, Ph.D., MBA*, Chief Scientific Officer and President of Dyadic's Biosciences Business, and *Mark Emalfarb*, Dyadic's founder and CEO.

#### **Dyadic International, Inc.**

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