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May 15, 2020
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Dyadic International, Inc. (DYAI - NASDAQ)

Steady as She Goes

Based on our DCF model and a 15% discount rate, we value Dyadic International at approximately $10.00 per share. We assume a 22.5% probability of ultimate success for C1, based on historical drug approval rates and number of projects in the pipeline. The model assumes revenue contributions from sources worldwide.

Current Price (5/14/2020)	$6.27
Valuation	**$10.00**

OUTLOOK

Dyadic has developed C1, its proprietary fungal expression system that can produce a variety of recombinant proteins. C1 has been commercialized in industrial applications and is in development for production of pharmaceutical grade proteins. C1 exhibits potential to economically produce biologic vaccines, virus like particles, antibodies, Fc-fusion, enzymes, AAVs and other biopharmaceuticals.

In 2015, the company sold its industrial business to DuPont for $75 million and retained the exclusive right to sublicense C1 for use in animal and human pharmaceutical applications. Proceeds from the DuPont sale provided cash for share repurchase and further development of the C1 platform for production of biologics. Additional R&D funding is provided by partners. Dyadic is currently working with several biopharmaceutical companies and government organizations to validate the technology.

In the near term, we expect growing R&D revenue as additional partners are added. By 2020, we anticipate first sales-related revenues from C1 represented by licensing fees, upfront payments, milestones and royalties.

SUMMARY DATA

52-Week High	**8.00**
52-Week Low	**2.51**
One-Year Return (%)	**51.5**
Beta	**0.42**
Average Daily Volume (sh)	**330,490**
Shares Outstanding (mil)	**27.5**
Market Capitalization ($mil)	**172.4**
Short Interest Ratio (days)	**5.2**
Institutional Ownership (%)	**16.3**
Insider Ownership (%)	**30.2**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**N/A**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/A**
P/E using 2019 Estimate	**N/A**
P/E using 2020 Estimate	**N/A**
Zacks Rank	**N/A**

Risk Level	**Above Average**
Type of Stock	**Small-Growth**
Industry	**Med-Biomed/Gene**

ZACKS ESTIMATES

Revenue

(In millions of USD)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2019	$0.4 A	$0.4 A	$0.5 A	$0.4 A	$1.7 A
2020	$0.3 A	$0.5 E	$0.6 E	$0.6 E	$2.0 E
2021					$3.0 E
2022					$3.1 E

Earnings per Share

	Q1	Q2	Q3	Q4	Year
2019	-$0.08 A	-$0.10 A	-$0.06 A	-$0.06 A	-$0.31 A
2020	-$0.08 A	-$0.07 E	-$0.07 E	-$0.07 E	-$0.30 E
2021					-$0.31 E
2022					-$0.31 E

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WHAT'S NEW

First Quarter Financial & Operational Results

Dyadic International Inc. (NASDAQ: DYAI) released first quarter financial and operational results on May 14, 2020. Revenues were $0.3 million and represented research and development proceeds from partners working to develop C1. Total expenses were $2.7 million and net loss was ($2.2) million after adding interest income. On a per-share basis, net loss was ($0.08). Total cash and investments were $31.3 million as of March 31, 2020, equivalent to ~$1.14 per share.

2020 has begun with a steady stream of additional relationships and expansions of existing relationships. Since our brief update at the beginning of the year, Dyadic has entered into six additional relationships. Opportunities for product development in infectious disease have emerged and the relationships have expanded with the Israeli Institute of Biological Research (IIBR) and Zoonoses Anticipation and Preparedness Initiative (ZAPI). Other work by partners to develop a treatment or vaccine against the coronavirus using C1 has also emerged. This includes efforts by a consortium of academics from Erasmus Medical Center, Utrecht University, University of Veterinary Medicine Hannover and Ufovax, a spin-off company from Scripps Research.

First quarter 2020 revenues fell 22% to $0.3 million reflecting a contraction from six revenue generating customers to five in 1Q:19 vs. 1Q:20. Total expenses in the three month period declined 5% to $2.7 million. Research and development[1] was down 27% to $1.0 million due to contract completion of the research service agreement with BDI and one fewer research collaboration, partially offset by additional spend for the glyco-engineering project. General and administrative expenses rose 16% to $1.7 million on account of higher insurance and service cost, noncash compensation, business development and investor relations costs partially offset by lower executive compensation and decreased legal expenses. Net loss was ($2.2) million for the period, essentially flat with the comparable quarter in 2019. On a per share basis, net loss was ($0.08) also matching the per share loss in the same period last year.

Cash burn expanded to ($2.0) million in the first quarter on an increase in accounts payable and a decrease in accrued expenses compared to trends in 1Q:19. Cash and equivalents were $31.3 million on March 31, 2020 down from $34.2 million at the end of 2019.

Animal Health

Dyadic has relationships with three of the four leading animal health companies. The latest addition is a fully-funded feasibility study to develop two proteins that was completed in March. One of the other relationships (designated "Leading Animal Health Co. in our summary below) is advancing to the second part of the project. The first part analyzed the productivity and quality of the protein, and the second will evaluate its feasibility to advance to animal trials. Animal health is particularly attractive to Dyadic as it could provide a faster route to commercialization and ultimate royalty and licensing revenues for the company. There are now a total of six collaborations in this space. Cost pressures are acute in animal health and require efficiencies that can effectively address large populations of livestock and pets. In a competitive landscape where cost is key, C1 is a leading technology that can provide needed efficiency.

The work with ZAPI is providing exposure of C1's capabilities not only to the European public-private partnership that serves to respond to new infectious disease threats, but also to the other partners involved in the effort. Other partners include large pharmaceutical firms such as AstraZeneca, Boehringer Ingelheim and the academic community in the veterinary and infectious disease spaces.

Research Collaborations

Since the beginning of 2020, Dyadic has entered into six new agreements to explore the use and potential of C1 to express proteins and other biological materials. There have also been two expansions of existing agreements with IIBR to create both a vaccine and antibody and ZAPI where two additional targets were added.

One of the new agreements pairs Dyadic with WuXi Biologics. WuXi is a global contract development and manufacturing organization (CDMO) with a broad portfolio of services to the biologics industry including drug

[1] Total R&D includes Cost of R&D Revenue, R&D and R&D Related Party amounts.

discovery, microbial expression and fermentation, cell culture derived products and other platforms to help sponsors and developers advance candidates through the research and development and commercialization process. The deal that Dyadic entered into with WuXi is a non-exclusive research license. We see this as an important collaboration as it provides C1 services broadly for mass production. Many of the interested parties that have signed agreements with Dyadic do not have the facilities to produce commercial volumes of product and the availability of a CDMO with C1 as one of its offerings provides a clear pathway to commercialization for these sponsors.

Another new feasibility study announced is in partnership with Ufovax[2], a spin off from Scripps Research in La Jolla, California. Ufovax will employ C1 to produce a single-component self-assembling protein nanoparticle (1c-SApNP) for HIV and coronavirus. Another relationship recently made public is an arrangement with the University of Oslo to conduct a feasibility study to develop an influenza vaccine. The results of the work may lead to further collaborations and expansion of the vaccines produced with C1. Also of interest is the consortium of academics that are working on a coronavirus vaccine. This collaboration was a product of relationships forged at ZAPI and has led to Dyadic partnering with three of the top 20 experts in the field to produce larger quantities of more potent vaccines and drugs at lower cost using C1.

Exhibit I – Summary of Dyadic Collaborations[3]

Collaborator	Deal	Ownership Description	Date
WuXi Biologics	Nonexclusive research license	0.0% Vaccine, drug, biologics	30-Mar-20
Animal Health Co.	Funded feasibility study	0.0% Two proteins	30-Mar-20
Small Unidentified	Funded feasibility study	0.0% No detail	30-Mar-20
EU Consortium	Feasibility Study	0.0% Corona vaccine	17-Mar-20
Ufovax/Scripps Research	Feasibility Study	0.0% HIV and Corona vaccine	17-Mar-20
University of Oslo	Feasibility Study	0.0% Influenza antigens	17-Mar-20
Leading Animal Health Co.	Research funding, full	0.0% 3 Protein Types	28-Oct-19
Top Tier Pharma	Proof of Concept (PoC)	0.0% 3 Protein Classes	13-Aug-19
Microbial division	Fermentation evaluation	Microbial division	3Q:19
Affiliate	Evaluate & experiment with C1	C1 commercialization goal	4Q:19
Serum Institute of India	PoC, Royalty, Milestone	0.0% 8 antibodies & 4 vaccines	7-May-19
Alphazyme	Sublicense, Milestone, Royalties	7.5% Molecular Enzymes	5-May-19
Luina Bio/Novovet	Sublicense, Milestone, Royalties	20.0% Animal Health	26-Apr-19
Sanofi Aventis	PoC, Research funding	0.0% Biologics & Vaccines	Sep-18
Mitsubishi Tanabe	PoC, Research funding	0.0% Difficult to express proteins	Mar-18
Pharma 1	PoC, Research funding	0.0% undisclosed proteins	Dec-18
Pharma 2	PoC, Research funding	0.0% undisclosed protein	Feb-19
Pharma 3	PoC, Research funding	0.0% undisclosed proteins	Apr-19
Pharma 4	PoC, Research funding	0.0% Primary metabolite	Feb-18
Pharma 5	PoC, Research funding	0.0% undisclosed protein	4Q:19
Israel Institute of Bio Research	Partner in-house research/Expanded	0.0% Antigen,Enzyme,Corona&proteins	1Q:18
University of Iowa	Partner in-house research	0.0% Undisclosed protein	2Q:19
Structural Genomics/Oxford	Partner in-house research	0.0% Undisclosed proteins	3Q:18
Fraunhofer/Molecular Biotech	Partner in-house research	0.0% Undisclosed vaccines	4Q:18
ZAPI	Research funding/Expanded	0.0% Epidemic Vaccines	2015
VTT/Internal	CRO	0.0% Metabolites/Nivolumab	2015
VLPbio	CRO	16.1% Virus Like Particles	2017
BDI	CRO	16.1% Certolizumab/AAV	2017

[2] UFO is short for "uncleaved prefusion-optimized" rather than what we initially hoped was a focus on the study of alien DNA. It refers to a process for efficiently producing envelope proteins.
[3] Source: Zacks Research and Dyadic corporate filings. Green highlight indicates animal health collaboration. Blue highlight indicates academic collaborator.

Dyadic continues to engage additional prospects and continues to sign non-disclosure agreements with them. One of the most important collaborations is with Sanofi where Dyadic was able to express all seven of the therapeutic and vaccine proteins that were identified in the project. More than 50% of the proteins were expressed above target levels and now Dyadic is preparing the final presentation to Sanofi to determine next steps. A decision is expected on whether or not to move forward is expected to occur mid-year 2020. We are optimistic on the other research collaborations with large pharmaceutical companies as they allow potential acquirers of this technology to evaluate C1's potential and have a stake in its success. With numerous interested parties invested in developing the technology we anticipate that if a bidding war begins, substantial value will accrue to Dyadic shareholders.

Other Projects

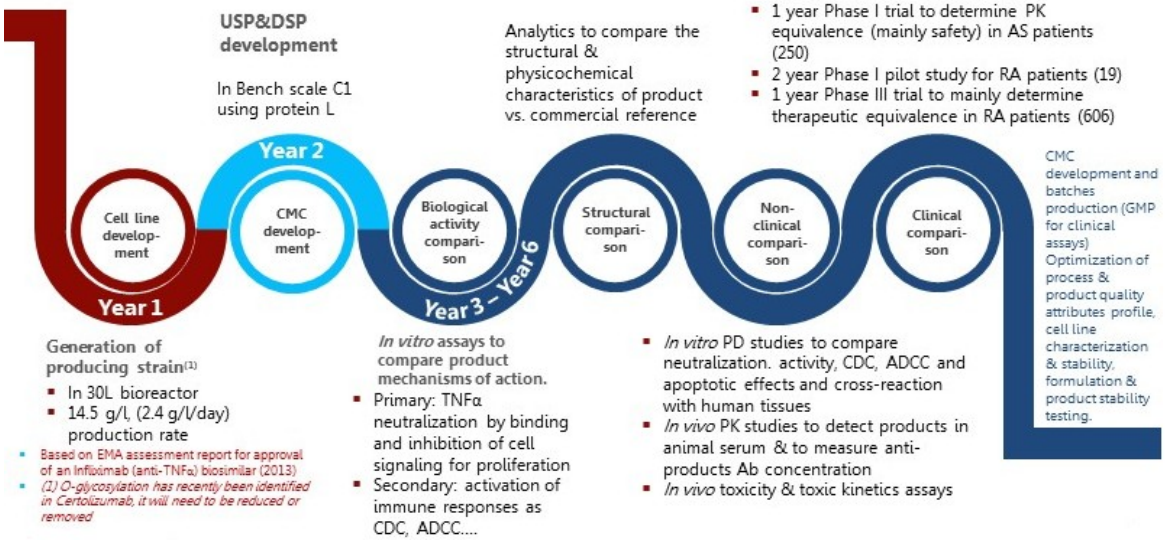
Dyadic's internal projects include four publicized efforts with two in the monoclonal antibody space (mAbs) and two others in non-traditional areas. With respect to biosimilars, BDI and VTT are synthesizing certolizumab and nivolumab respectively. Certolizumab was a good first choice as it is a relatively simple antigen binding fragment (Fab) mAb which Dyadic was able to produce with biological activity that compares favorably with Cimzia. The other biosimilar, nivolumab, is more complex. This biologic presents a glycosylated structure which has also been successfully expressed by C1. Currently, glyco-engineering efforts are underway to potentially make Dyadic's copy a biobetter as compared to Opdivo.

Adeno-associated viruses (AAVs), which are used to deliver gene sequences for gene therapy, are another area of investigation for Dyadic. BDI is developing AAVs to meet increasing demand for this product which is in short supply. The fourth pursuit targets secondary metabolites which are important for digestion of nutrients, functional health of cells and also used in cosmetic applications. Dyadic aims to demonstrate that C1 can produce these metabolites and may either fund the project internally through continued efforts with VTT or partner with third parties.

Glycosylation

In February, Dyadic announced that it had achieved G2 human-like glycosylation with its partner VTT. C1 was able to produce a G2 glycan level of over 76% using host cell proteins, following the achievement of G0 in November 2019. Dyadic can additionally produce high concentrations of Man_{3-9} and Man_3 which, along with G0 and G2, allows C1 to produce vaccines, mAb and other biologics that are either immunogenic or recognized as self by the immune system. Dyadic expanded its contract with VTT in the first quarter paying an additional €700,000 over the next 19 months to accelerate the development of G0F and G2F. We expect to hear updates on these glycoforms later this year.

Exhibit II – Certolizumab Development Pathway[4]



[4] Source: Dyadic Corporate Presentation, October 29, 2019.

Milestones

Dyadic has performed well since we initiated coverage adding numerous new collaborations. We include below recently achieved milestones and others we expect in the near term:

- Additional detail on glycosylation progress including G0F & G2F – 1H:20
- Update on Sanofi arrangement – mid-year 2020
- Potential cash inflow from licensing or development arrangement – 2020/2021

Summary

Dyadic has started 2020 with several new agreements and expansions. These achievements include the addition of new collaborations addressing influenza, coronavirus, animal health and other indications. Internal programs are also advancing for certolizumab and nivolumab, secondary metabolites and AAVs. Progress is also being made with protease deletions and achieving additional glycosylation forms. These all contribute to the "shots on goal" which we believe will lead to a billion dollar opportunity.

We anticipate that there will be additional arrangements signed in 2020, some of which may include upfront cash flows. The pandemic may catalyze the pathway forward for C1 to be used as an expression system producing vaccines and treatments in clinical trials, which would be a tremendous achievement. C1 may be able to provide much higher output with improved characteristics compared to current approaches, which addresses one of the primary bottlenecks during a pandemic.

We see opportunities for additional equity interest in fast growing partnerships, upfronts, milestones and royalties from larger partnerships and potentially a buyout. There is substantial value in Dyadic's broad portfolio of options and in their exciting technology that can revolutionize the protein expression industry. Future favorable catalysts include the addition of more collaborators, achieving output milestones and entering the clinical trial process. We maintain our target price to $10.00 per share.

PROJECTED FINANCIALS

Dyadic International, Inc. - Income Statement

Dyadic International, Inc.	2019 A	Q1 A	Q2 E	Q3 E	Q4 E	2020 E	2021 E	2022 E
Total Revenues	**$1.7**	**$0.3**	**$0.5**	**$0.6**	**$0.6**	**$2.0**	**$3.0**	**$3.1**
YOY Growth	*30%*	*-22%*	*28%*	*32%*	*39%*	*20%*	*49%*	*3%*
Cost of R&D Revenue	$1.5	$0.3	$0.4	$0.5	$0.5	$1.6	$2.4	$2.48
R&D	$3.1	$0.8	$0.8	$0.8	$0.8	$3.2	$3.5	$3.7
R&D Related Party	$0.9	$0.0	$0.4	$0.4	$0.4	$1.3	$2.0	$2.0
G&A	$5.5	$1.7	$1.1	$1.2	$1.2	$5.2	$4.8	$4.8
Foreign Currency Exchange	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Income from operations	($9.3)	($2.4)	($2.2)	($2.3)	($2.3)	($9.3)	($9.7)	($9.9)
Operating Margin	*-552%*	*-755%*	*-448%*	*-387%*	*-387%*	*-460%*	*-323%*	*-319%*
Interest Income	$1.0	$0.2	$0.2	$0.2	$0.2	$0.6	$0.5	$0.5
Other	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Pre-Tax Income	($8.3)	($2.2)	($2.1)	($2.2)	($2.2)	($8.6)	($9.2)	($9.4)
Provision for Income Tax	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Tax Rate	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Net Income	**($8.3)**	**($2.2)**	**($2.1)**	**($2.2)**	**($2.2)**	**($8.6)**	**($9.2)**	**($9.4)**
Net Margin	*-494%*	*-702%*	*-416%*	*-360%*	*-360%*	*-427%*	*-307%*	*-303%*
Reported EPS	**($0.31)**	**($0.08)**	**($0.07)**	**($0.07)**	**($0.07)**	**($0.30)**	**($0.31)**	**($0.31)**
YOY Growth								
Shares Outstanding	27.00	27.45	28.20	29.00	29.30	28.49	29.50	30.00

Source: Company Filing // Zacks Investment Research, Inc. Estimates

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HISTORICAL STOCK PRICE

Dyadic International, Inc. – Share Price Chart



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