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November 14, 2019
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Dyadic International, Inc. (DYAI - NASDAQ)

Dyadic Herding Animal Health Partners

Based on our DCF model and a 15% discount rate, Dyadic International is valued at approximately $9.00 per share. We assume a 22.5% probability of ultimate success for C1, based on historical drug approval rates and quantity of projects in the pipeline. The model assumes revenue contributions from sources worldwide.

Current Price (11/13/2019)	$5.74
Valuation	**$9.00**

OUTLOOK

Dyadic has developed a gene expression system based on C1, its proprietary fungal expression system that can produce a variety of recombinant proteins. C1 is already commercial in industrial applications and is in development for use in the development and 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 comes from 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, which represent licensing fees, upfront payments, milestones and royalties.

SUMMARY DATA

52-Week High	**7.30**
52-Week Low	**1.73**
One-Year Return (%)	**205**
Beta	**0.20**
Average Daily Volume (sh)	**101,721**
Shares Outstanding (mil)	**27.2**
Market Capitalization ($mil)	**156.0**
Short Interest Ratio (days)	**8.1**
Institutional Ownership (%)	**6.6**
Insider Ownership (%)	**45.5**
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 2018 Estimate	**N/A**
P/E using 2019 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)
2018	$0.2 A	$0.2 A	$0.3 A	$0.7 A	$1.3 A
2019	$0.4 A	$0.4 A	$0.5 A	$0.4 E	$1.7 E
2020					$2.2 E
2021					$3.0 E

Earnings per Share

	Q1	Q2	Q3	Q4	Year
2018	-$0.07 A	-$0.06 A	-$0.06 A	-$0.02 A	-$0.21 A
2019	-$0.08 A	-$0.10 A	-$0.06 A	-$0.07 E	-$0.31 E
2020					-$0.31 E
2021					-$0.33 E

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WHAT'S NEW

Third Quarter 2019 Financial & Operational Results

Dyadic International Inc. (NASDAQ: DYAI) released third quarter 2019 financial and operational results on November 13, 2019. Revenues were $0.5 million and represented research and development proceeds from partners working to develop C1. Total expenses were $2.4 million and net loss was ($1.7) million after adding interest income. On a per share basis, net loss was ($0.06). Total cash and investments were $37.0 million as of June 30, 2019, equivalent to ~$1.36 per share.

The third quarter continued the trend of securing collaboration agreements. A fifth animal health collaboration was announced and an expansion of a previous animal health arrangement added a third protein. Dyadic has entered into over 15 proof of concept collaborations in the last 18+ months and in the third quarter there were eight ongoing, revenue generating projects underway. Of these active relationships, ZAPI is at the forefront with final validated data expected in the near term and Serum Institute has transferred more than half of its 12 gene sequences to Dyadic for insertion into C1. Alphazyme is developing its fermentation technology and technology transfer efforts are pending. In other news, Dyadic was added to the Russell Microcap Index on the first day of the third quarter and it extended its research contract with long time partner VTT. Dyadic was active during the fall investor conference season, attending no less than seven events spread across the eastern, mid and western United States.

Third quarter revenues increased 73% to $455,000 due to an increase in research collaborations. Total expenses in the period increased 17% to $2.4 million. Research and development[1] was up 32% equaling $2.4 million on the addition of new research agreements, but down sequentially due to the completion of a contract with BDI. General and administrative expenses rose 3% to $1.1 million on higher stock compensation, annual bonuses and incentives, business development and investor relations costs that were offset by lower compensation expenses. Net loss was ($1.7) million for the period, compared to ($1.5) million in 3Q:18. On a per share basis, net loss was ($0.06) flat with the prior year.

The company originally guided for cash burn of ($8) to ($10) million in 2019; however, due to contributions from additional research collaborations and tax incentives, cash burn is now expected to be between ($5.5) and ($6.5) million. Cash and equivalents were $37.0 million down from $41.5 million as of December 31, 2018 and $38.4 million on June 30, 2019.

Animal Health

Dyadic announced another animal health partnership on October 28th, bringing to total number of collaborations in this area to five. This most recent alliance will direct the C1 expression system to express three different types of proteins that may be used in research and commercial projects. Animal health is a particularly attractive segment as it represents a large and growing demand, has favorable regulatory hurdles and less expensive development costs while providing a faster track to commercialization as compared to human health. Cost pressures are acute in the space and require efficiencies that can effectively address large populations of livestock and pets. This competitive framework requires a focus on cost and efficiency which favors the use of an efficient expression system such as C1.

The work with Zoonose Anticipation and Preparedness Initiative or 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 contributing to the effort. This includes a broad collection of large pharmaceuticals such as AstraZeneca and Boehringer Ingelheim and the academic community in the veterinary space.

Research Collaborations

Over the last 18+ months, Dyadic has signed 15 agreements to explore the use and potential of C1 to express proteins and other biological materials. Since the start of the third quarter, two additional agreements have been confirmed, cementing Dyadic's presence in the large pharmaceutical and animal health spaces.

Dyadic is open to a number of structures for partners to collaborate with C1. Equity interest, upfront cash, milestones and royalties are all acceptable structures for worthwhile partnerships. For early stage partners, Dyadic

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

has favored a stake in the future of the collaboration. This has led to ownership in Alphazyme, Luina Bio/Novovet, VLPbio and BDI. In the case of larger entities, the traditional upfront cash followed by milestones and royalties is more appropriate. On the upfront side, we may see cash flows next year or in 2021 that could dwarf revenues recognized to date.

Exhibit I – Summary of Dyadic Collaborations[2]

Collaborator	Deal	Ownership	Description	Date
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
Serum Institute of India	PoC, Royalty, Milestone	0.0%	12 antibodies & 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 protein	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
Israel Institute of Bio Research	Research funding	0.0%	Antigen	1Q:18
University of Iowa	Research funding	0.0%	Undisclosed protein	2Q:19
Structural Genomics/Oxford	Research funding	0.0%	Undisclosed proteins	3Q:18
Fraunhofer/Molecular Biotech	Research funding	0.0%	Undisclosed proteins	4Q:18
ZAPI	Research funding	0.0%	Epidemic Vaccines	2015
VTT/Internal	CRO	0.0%	Secondary Metabolite/Nivolumab	2015
VLPbio	CRO	3.3%	Virus Like Particles	2017
BDI	CRO	16.1%	Certolizumab/AAV	2017

Dyadic continues to hold discussions with prospects and continues to sign non-disclosure agreements with them. We speculate that there could be an accelerating rate to partner additions as momentum builds and biologics producers that are not now participating fear exclusion. We are optimistic on research collaborations with large pharmaceutical companies as it allows 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 Highlights

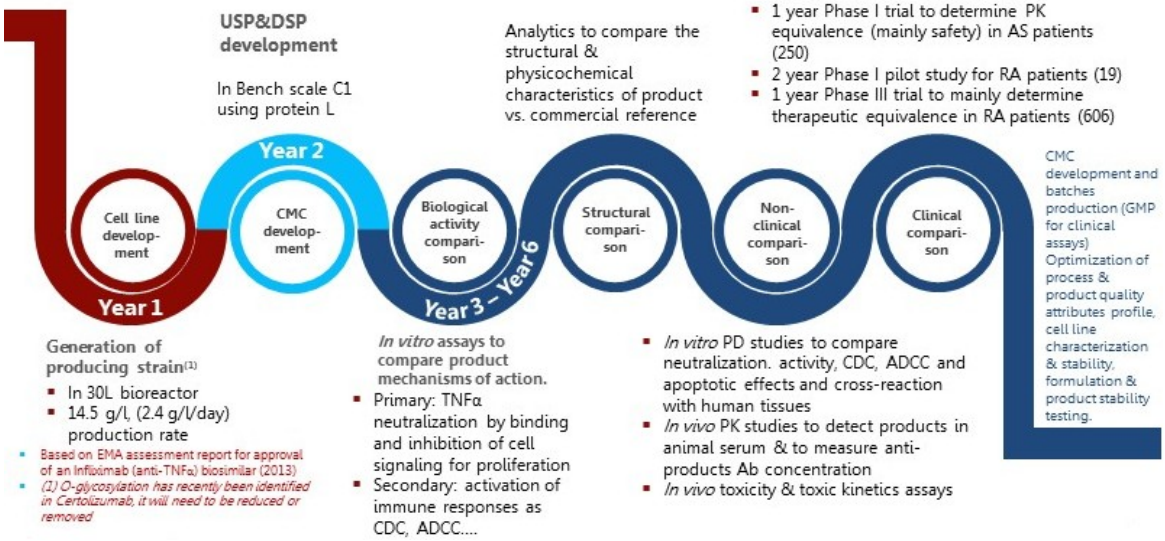
In addition to the partnerships and collaborations, Dyadic is developing internal projects. There are four publicized efforts advancing at the company with two in the monoclonal antibody space (mAbs) and two others in non-traditional areas. On the biosimilars side, BDI and VTT are synthesizing certolizumab 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, represents an increased level of complexity. This biologic is a glycosylated structure which has also been successfully expressed by C1. Currently, glyco-engineering efforts are underway to potentially make it 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

[2] Source: Zacks Research and Dyadic corporate filings. Green highlight indicates animal health collaboration. Blue highlight indicates academic collaborator.

health of cells and also used in cosmetic applications. Dyadic is seeking to demonstrate that C1 can produce these metabolites and may either to fund this internally through continued efforts with VTT or partner with third parties.

Exhibit II – Certolizumab Development Pathway[3]



Milestones

Dyadic has performed well over the last year and a half, adding numerous new collaborations in 2018 and five to date in 2019. We include below recently achieved milestones and others we expect in the near term:

- NASDAQ Listing – April 2019
- Advances in glycoengineering of C1
- Additional protease deletions in C1
- Advancements in nivolumab development
- Comparison work completed for certolizumab vs. Cimzia
- Additional collaborations
  - Luina Bio – April 2019
  - Alphazyme – May 2019
  - Serum Institute of India – May 2019
  - Top tier pharmaceutical company – August 2019
  - Leading animal health company – October 2019
- VTT Contract Extension – July 2019
- VTT PEGS Lisbon: Update on glycosylation – November 21, 2019
- Additional detail on glycosylation progress – 1H:20
- Potential cash inflow from licensing or development arrangement – 2020/2021

Summary

Dyadic has experienced a whirlwind year in 2019 with continued progress on a number of fronts. These achievements include the addition of several new collaborations, advancement of internal programs for certolizumab and nivolumab, secondary metabolites and AAVs as well as progress with protease deletions and achieving the human G0 glycosylation form, which is expected around year end. These all contribute to the "shots on goal" which we believe will eventually lead to a billion dollar opportunity.

The details provided on the conference call and in the third quarter press release demonstrate both progress on internally developed programs as well as the continued addition of a broad variety of partners with a particular affinity towards animal health. We see opportunities for additional equity interest in fast growing partnerships, upfronts, milestones and royalties from larger partnerships and potentially a buyout. There is a substantial level of 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 of $9.00 per share.

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

PROJECTED FINANCIALS

Dyadic International, Inc. - Income Statement

Dyadic International, Inc.	2018 A	Q1 A	Q2 A	Q3 A	Q4 E	2019 E	2020 E	2021 E
Total Revenues	**$1.3**	**$0.4**	**$0.4**	**$0.5**	**$0.4**	**$1.7**	**$2.2**	**$3.0**
YOY Growth	*71%*	*118%*	*142%*	*73%*	*-36%*	*30%*	*30%*	*36%*
Cost of R&D Revenue	$1.0	$0.3	$0.3	$0.4	$0.4	$1.4	$1.8	$2.4
Provision for Contract Losses	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
R&D	$2.1	$0.7	$0.8	$0.8	$0.8	$3.1	$3.2	$3.5
R&D Related Party	$1.2	$0.4	$0.3	$0.1	$0.2	$1.0	$1.8	$2.0
G&A	$4.5	$1.4	$1.9	$1.1	$1.2	$5.6	$4.6	$4.8
Foreign Currency Exchange	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Income from operations	($7.6)	($2.4)	($3.0)	($1.9)	($2.1)	($9.4)	($9.1)	($9.7)
Operating Margin	*-586%*	*-606%*	*-758%*	*-428%*	*-469%*	*-557%*	*-415%*	*-323%*
Interest Income	$0.9	$0.3	$0.3	$0.2	$0.2	$1.0	$0.6	$0.5
Other	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Pre-Tax Income	($6.7)	($2.2)	($2.7)	($1.7)	($1.9)	($8.5)	($8.5)	($9.2)
Provision for Income Tax	($1.0)	$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	**($5.7)**	**($2.2)**	**($2.7)**	**($1.7)**	**($1.9)**	**($8.5)**	**($8.5)**	**($9.2)**
Net Margin	*-439%*	*-540%*	*-690%*	*-374%*	*-428%*	*-501%*	*-386%*	*-307%*
Reported EPS	**($0.21)**	**($0.08)**	**($0.10)**	**($0.06)**	**($0.07)**	**($0.31)**	**($0.31)**	**($0.33)**
YOY Growth	*178%*	*12.2%*	*76.4%*	*12.7%*	*260.6%*	*52%*		
Shares Outstanding	27.67	26.71	26.83	27.18	27.30	27.01	27.60	27.90

Source: Company Filing // Zacks Investment R

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HISTORICAL STOCK PRICE

Dyadic International, Inc. – Share Price Chart



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