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Medicenna Therapeutics Corp. (MDNA-NASDAQ)

MDNA: Looking to Start MDNA11 Phase 1 Trial in Mid-2021…

Based on our probability adjusted DCF model that takes into account potential future revenues of MDNA55 and MDNA11, MDNA is valued at $11/share. This model is highly dependent upon continued clinical success of those compounds and will be adjusted accordingly based upon future clinical results.

Current Price (11/19/20)	$3.75
Valuation	**$11.00**

OUTLOOK

On November 13, 2020, Medicenna Therapeutics Corp. announced financial results for the second quarter of fiscal year 2021 ending Sep. 30, 2020 and provided a business update. The company recently presented two posters at the 32nd EORTC-NCI-AACR Symposium on Molecular Targets and Cancer Therapeutics on MDNA55, MDNA11, and a long-acting bispecific IL-2/IL-13 Superkine. Medicenna is planning to submit an Investigational Medical Product Dossier (IMPD; similar to an IND) in the UK in support of initiating a Phase 1/2 study of MDNA11 in mid-2021, with initial safety data from that study possible in late 2021. In addition, the company is looking to nominate a lead candidate for its bispecific Superkine program during 2021.

SUMMARY DATA

52-Week High	**$5.11**
52-Week Low	**$0.98**
One-Year Return (%)	**186.26**
Beta	**1.81**
Average Daily Volume (sh)	**59,868**
Shares Outstanding (mil)	**49**
Market Capitalization (C$mil)	**$183**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**25**
Insider Ownership (%)	**33**
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**

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

ZACKS ESTIMATES

Revenue
(In millions of $CAD)

	Q1 (Jun)	Q2 (Sep)	Q3 (Dec)	Q4 (Mar)	Year (Mar)
2020	0 A	0 A	0 A	0 A	0 A
2021	0 A	0 A	0 E	0 E	0 E
2022					0 E
2023					0 E

Earnings per Share
(in $CAD)

	Q1 (Jun)	Q2 (Sep)	Q3 (Dec)	Q4 (Mar)	Year (Mar)
2020	-$0.05 A	- $0.07 A	-$0.07 A	-$0.07 A	-$0.26 A
2021	-$0.05 A	-$0.08 A	-$0.06 E	-$0.06 E	-$0.25 E
2022					-$0.26 E
2023					-$0.33 E

Business Update

Poster Presentation on IL-2/IL-13 Bispecific Superkine

On October 26, 2020, Medicenna Therapeutics Corp. (MDNA) announced the company presented a poster at the 32nd EORTC-NCI-AACR Symposium on Molecular Targets and Cancer Therapeutics. The poster, titled "Emergence of Novel Long-acting Mono- and Bi-specific IL-2/IL-13 Superkines as Potent Immune Modulators" (a copy can be accessed here), described preclinical data on both MDNA11 and a bispecific IL-2/IL-13 Superkine.

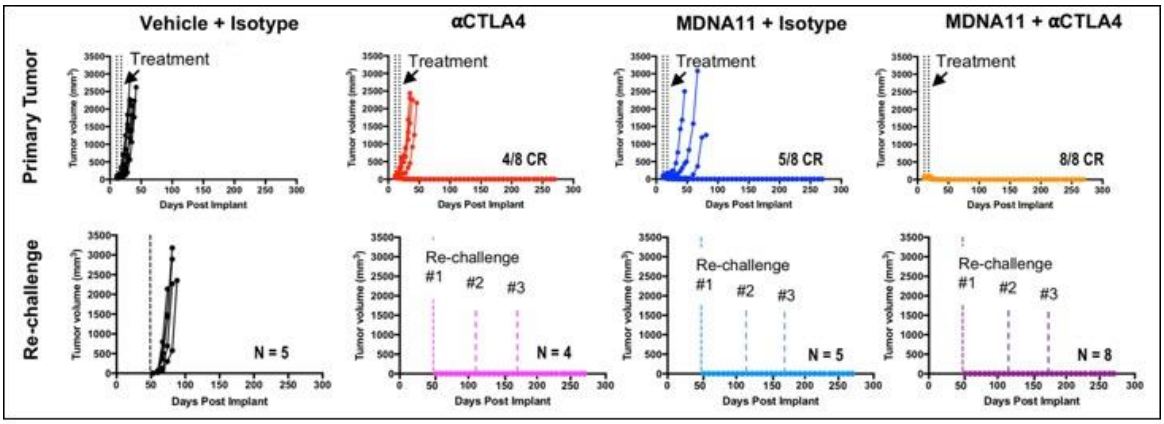
MDNA11

MDNA11 is a long-acting variant of IL-2 that is engineered to have enhanced binding to CD122 and no affinity for CD25. IL-2 is a 16 kDa protein that activates a wide range of leukocytes, including T cells and natural killer (NK) cells through binding IL-2 receptors (IL-2Rα [CD25], IL-2Rβ [CD122], and IL-2Rγ [CD132]), with the arrangement of these receptors dictating the response seen. Binding of IL-2 to a heterodimer consisting of CD122 and CD132 is of "intermediate affinity', whereas a heterotrimer consisting of all three IL-2Rs is a 'high affinity' complex. The heterotrimer is typically found on activated T cells (including regulatory T cells) while naïve T cells and NK cells only express the heterodimer. Thus, modifying IL-2 signaling to enhance binding to the CD122/CD132 complex could enhance T cell activation while diminishing the effect of regulatory T cells. An enhanced version of IL-2 that exhibited increased affinity to CD122 was first described in 2012 (Levin *et al*., 2012) and additional work has yielded a family of long-acting 'IL-2 Superkines' with enhanced features compared to IL-2. The following table shows the EC_{50} values for CD8+ T cells, natural killer (NK) cells, and T regulatory cells (Tregs) for MDNA11 and native IL-2. The lower the EC_{50} value the higher the potency, with MDNA11 having much higher potency for cancer fighting CD8+ T cells and NK cells compared to native IL-2, while MDNA11's ability to stimulate Tregs (involved in tumor promotion) is much lower than native IL-2.

Human PBMC P-STAT5 (EC_{50}, pM)	rhIL-2	MDNA11
Naïve $CD8^+$ T cells	3390	460
NK cells	201.5	68.9
Tregs	5.6	160

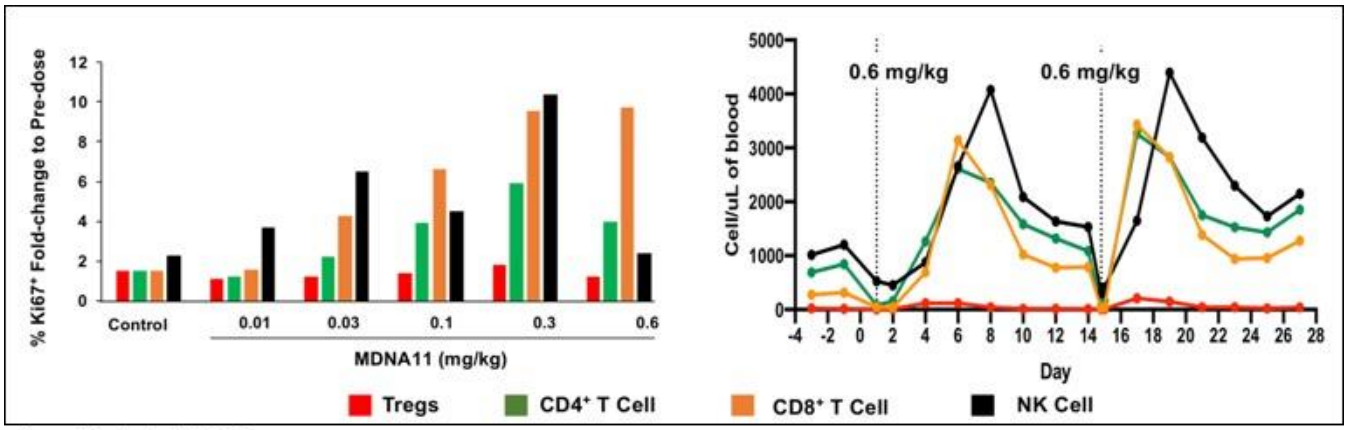
Source: Merchant *et al*., 2020

The following series of graphs show that combination therapy of MDNA11 and an anti-CTLA4 monoclonal antibody inhibits tumor growth in all animals tested in a CT26 tumor model, which was superior to monotherapy with either MDNA11 or anti-CTLA4. Interestingly, when mice that showed no tumor growth in the original experiment were re-challenged with CT26 cells in the opposite flank, there was no tumor growth seen for any of the mice.



Source: Merchant *et al*., 2020

In non-human primates (NHPs), MDNA11 induces lymphocyte, but not eosinophil, expansion and a durable proliferation and expansion of CD4+ T cells, CD8+ T cells, and NK cells, as shown in the following figure.



Source: Merchant *et al.*, 2020

These data are highly encouraging and show that MDNA11 is likely to show excellent synergism with checkpoint inhibitor therapy while exhibiting a favorable pharmacodynamic profile. We anticipate Medicenna filing an IMPD in the UK (equivalent to an IND filing in the U.S.) with the goal of initiating a Phase 1 clinical trial in mid-2021.

IL-2/IL-13 Bispecific Superkine

Medicenna is developing an IL-2/IL-13 bispecific Superkine in an effort to turn 'cold' tumors 'hot'. A 'cold' tumor is one that is not responsive to checkpoint inhibitor therapy because of an unfavorable tumor microenvironment (e.g., low CD8+/NK cell counts, high Treg counts, high immunosuppressive myeloid cells).

The IL-2/IL-13 bispecific Superkine is designed to increase CD8+ T cell and NK cell counts (through binding of IL-2 to the CD122/CD132 heterodimer) and decrease the number of immunosuppressive myeloid cells (through binding of the IL-4 type II receptor, which consists of a heterodimer composed of IL-4Rα and IL-13Rα1). A cartoon representation of the bispecific Superkine compound (MDNA109FEAA-Fc-MDNA413) is shown below.

Source: Merchant *et al.*, 2020

Results show that MDNA109FEAA-Fc-MDNA413 retains similar potency to the CD122/CD132 heterodimer as monospecific binders, as shown through induction of an anti-tumor Th1 immune response. In addition, MDNA109FEAA-Fc-MDNA413 inhibits a pro-tumor Th2 immune response through inhibition of IL-4/IL-13 induced signaling. The company is hoping to nominate a lead bispecific Superkine for clinical development in 2021.

Phase 3 Plan for MDNA55 Program

On October 15, 2020, Medicenna provided an update for the MDNA55 program following an 'End-of-Phase 2' meeting with the U.S. FDA. The FDA has guided for the company to proceed with a Phase 3 registration trial of MDNA55 in patients with recurrent glioblastoma (rGBM) that harbor no IDH1/IDH2 mutations. There are two noteworthy points regarding the proposed trial:

1) The trial will utilize a matched external control group for 2/3rd of the control arm.
2) Patients will be randomized 3:1 to receive MDNA55 or standard of care (SOC). SOC will consist of physician's choice (temozolomide, bevacizumab, lomustine, etc.)

This is the first instance we are aware of where a company has been encouraged to utilize a substantial external control arm for a cancer trial and could represent a paradigm shift in the way trials are conducted for diseases that

have a significant unmet need for improved therapeutics. In addition, the use of a sizeable external control arm will decrease the number of patients required in the trial, which will help to defray costs and could expedite the time to complete the trial. With a 3:1 randomization it will also allow for more patients to receive MDNA55 than would be possible with a standard 1:1 randomization.

We estimate a total of approximately 150 patients will be enrolled in the treatment arm, with approximately 50 patients enrolled in the control arm. Another 100 patients will be enrolled into the external control arm, with records for those patients derived from previous clinical trials that have been conducted since January 2016. Patients included in the external control arm will have characteristics similar to those enrolled in the treatment and control arms and will be identified in a manner similar to that used for the company's analysis of the Phase 2 clinical trial that utilized a synthetic control arm (discussed below).

We expect that the positive 'End-of-Phase 2' meeting with the FDA will invigorate Medicenna's efforts to identify a suitable partner to advance the program, as we do not anticipate the company initiating a Phase 3 program for MDNA55 without a collaboration agreement with a larger pharmaceutical company in place.

MDNA55 Update

Medicenna previously completed a Phase 2b clinical trial of MDNA55 in patients experiencing either first or second GBM relapse (NCT02858895). It was a multi-center, open label, single arm study with the primary endpoint of median overall survival (mOS) and a secondary endpoint of objective response rate (ORR) following a single intra-tumoral infusion of MDNA55 in adult rGBM subjects.

The company recently presented a late-breaking poster with updated results at the 32nd EORTC-NCI-AACR Symposium on Molecular Targets and Cancer Therapeutics. A copy of the poster can be accessed here. The following table shows that in comparison to currently approved therapies, treatment with MDNA55 demonstrated an approximately 100% increase in two-year survival. This is true for both the entire population, and a subpopulation composed of IL-4 receptor (IL-4R) high expression patients and those with low IL-4R expression but who received a high dose of MDNA55.

Therapy	rGBM Population sample size, N	mOS (months)	OS-12	OS-24
MDNA55 (All Subjects)	(n=44)	11.9	48%	20%
MDNA55 Subpopulation (IL4R High + IL4R Low$^{High\ Dose}$)	(n=32)	14.0	56%	20%
Approved Therapies				
Bevacizumab[1]	(n=85)	9.2	22%*	NA
Bevacizumab[2]	(n=48)	7.8	28%*	NA
Bevacizumab + Lomustine[3]	(n=288)	9.1	31.5%	5%*
Lomustine[3]	(n=149)	8.6	34.1%	10%*
Temozolomide[4]	(n=138)	5.4	18%*	NA
Carmustine implant[5]	(n=72)	6.5	12%*	5%*
Tumor Treating Fields[6]	(n=120)	6.6	20%	10%*

Source: Sampson *et al.*, 2020

In addition, in comparison to currently approved therapies, treatment with MDNA55 demonstrated a >100% improvement in progression-free survival (PFS) at 12 months both for the entire population and the subpopulation described above.

Therapy	N	mPFS	PFS-12
MDNA55 Groups			
All Subjects	41	3.6*	27%
IL4R High + IL4R Low$^{High\ Dose}$	32	3.0*	24%
Approved Therapies			
Avastin[1]	85	4.2	10%**
Avastin[2]	48	4.0	10%**
Lomustine[3]	149	1.5	2%**
Avastin + Lomustine[3]	288	4.2	10%**

Source: Sampson *et al.*, 2020

Financial Update

On November 13, 2020, Medicenna announced financial results for the second quarter of fiscal year 2021 that ended September 30, 2020. The company reported a net loss for the second quarter of fiscal year 2021 of CAD$3.8 million, or CAD$0.08 per share, compared to a net loss of CAD$1.9 million, or CAD$0.07 per share, for the three months ending September 30, 2019. R&D expenses for the second quarter of fiscal year 2021 were CAD$2.2 million compared to CAD$1.2 million for the second quarter of fiscal year 2020. The increase in expenses was primarily due to no reimbursement under the CPRIT grant in the current quarter and increased manufacturing and development expenditures for the MDNA11 program. G&A expenses for the second quarter of fiscal year 2021 were CAD$1.7 million compared to CAD$0.6 million for the three months ending September 30, 2019. The increase was primarily due to public company expenses associated with the Nasdaq listing and related directors and officers liability insurance premiums.

As of September 30, 2020, Medicenna had approximately CAD$34.2 million in cash and cash equivalents. We estimate this is sufficient to fund operations into mid-2022. As of November 13, 2020, Medicenna had approximately 49.0 million shares outstanding and, when factoring in options and warrants, a fully diluted share count of approximately 60.2 million.

Conclusion

Looking ahead to 2021, we anticipate the company filing to initiate a Phase 1 clinical trial of MDNA11 in the UK, which we anticipate beginning mid-year. If it does begin around that time, it is possible we could see initial safety data before the end of 2021. In addition, we are interested to learn more regarding the lead bispecific Superkine candidate in the year ahead. Lastly, now that the company has a clear plan in place for a Phase 3 trial for MDNA55 we are hopeful that a partnership can be entered into in the near term. With no changes to our model our valuation remains at $11 per share.

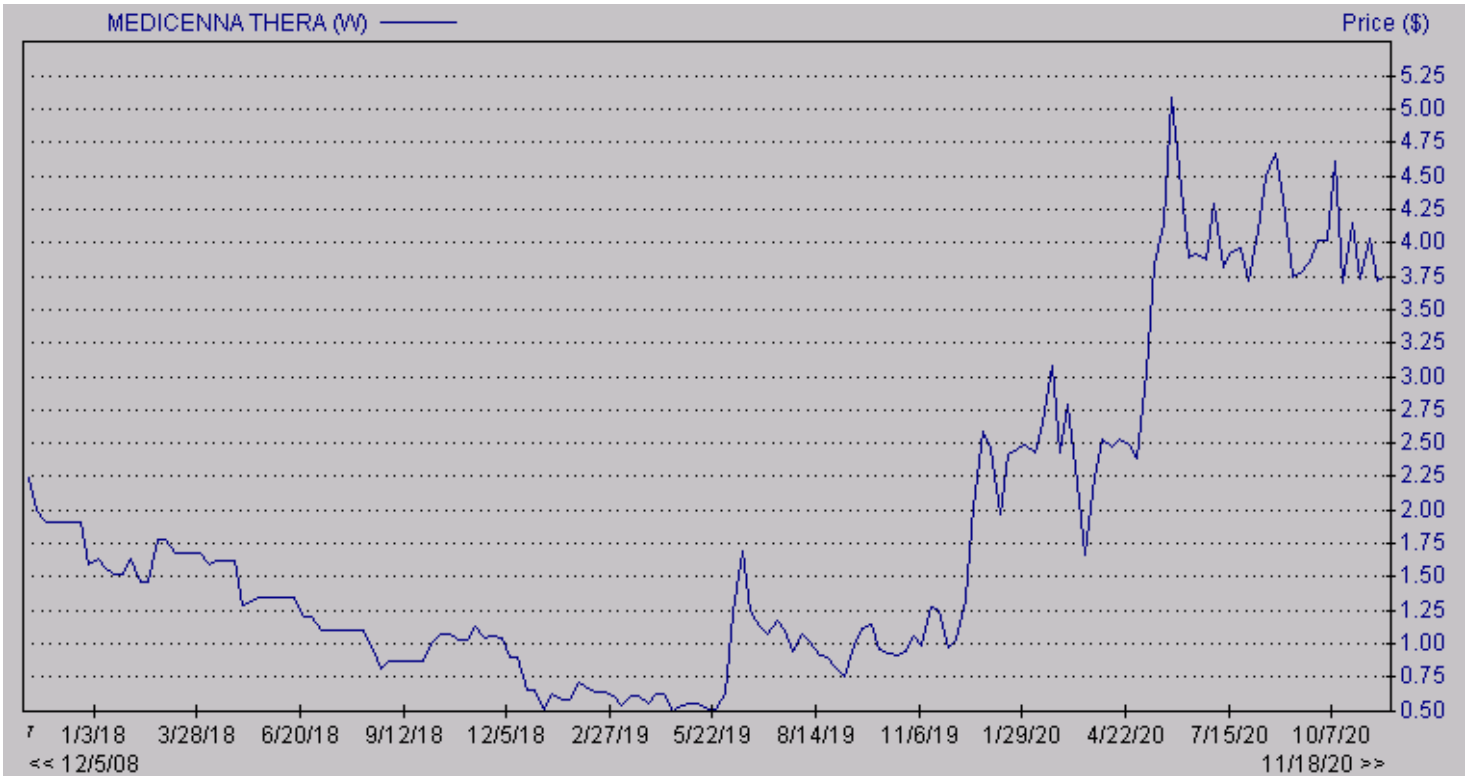
PROJECTED FINANCIALS

Medicenna Therapeutics Corp.
Income Statement

Medicenna Therapeutics Corp. In Canadian Dollars	FY 2020 E	Q1 FY21 A	Q2 FY21 A	Q3 FY21 E	Q4 FY21 E	FY 2021 E	FY 2022 E	FY 2023 E
MDNA55	$0	$0	$0	$0	$0	$0	$0	$0
YOY Growth	-	-	-	-	-	-	-	-
MDNA11	$0	$0	$0	$0	$0	$0	$0	$0
YOY Growth	-	-	-	-	-	-	-	-
Other Income	$0	$0	$0	$0	$0	$0	$0	$0
YOY Growth	-	-	-	-	-	-	-	-
Total Revenues	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
YOY Growth	-	-	-	-	-	-	-	-
Cost of Sales	$0	$0	$0	$0	$0	$0	$0	$0
Product Gross Margin	-	-	-	-	-	-	-	-
Research & Development	$5.9	$1.8	$2.2	$2.0	$2.0	$8.0	$10.0	$13.0
General & Administrative	$2.4	$0.7	$1.7	$0.8	$0.8	$4.0	$3.3	$3.8
Other (Income) Expense	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Operating Income	($8.2)	($2.5)	($3.9)	($2.8)	($2.8)	($12.0)	($13.3)	($16.8)
Operating Margin	-	-	-	-	-	-	-	-
Non-Operating Expenses (Net)	($0.0)	($0.2)	($0.1)	$0.0	$0.0	($0.2)	$0.1	$0.1
Pre-Tax Income	($8.3)	($2.4)	($3.8)	($2.8)	($2.8)	($12.2)	($13.2)	($16.7)
Income Taxes	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Cumulative translation adjustment	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Net Income	**($8.2)**	**($2.4)**	**($3.8)**	**($2.8)**	**($2.8)**	**($12.2)**	**($13.2)**	**($16.7)**
Net Margin	-	-	-	-	-	-	-	-
Reported EPS	**($0.26)**	**($0.05)**	**($0.08)**	**($0.06)**	**($0.06)**	**($0.25)**	**($0.26)**	**($0.33)**
YOY Growth	-	-	-	-	-	-	-	-
Basic Shares Outstanding	31.9	48.3	48.8	49.0	49.0	48.8	50.0	50.0

Source: Zacks Investment Research, Inc. *David Bautz, PhD*

HISTORICAL STOCK PRICE



Source: Zacks Small Cap Research

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