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David Bautz, PhD
312-265-9471
dbautz@zacks.com

scr.zacks.com
10 S. Riverside Plaza, Chicago, IL 60606

MediciNova, Inc. (MNOV-NASDAQ)

MNOV: Update on Intranasal SARS-CoV-2 Vaccine…

Based on our probability adjusted DCF model that takes into account potential future revenues from MN-166 in ALS, progressive MS and addiction; MN-001 in NASH and IPF; and the SARS-CoV-2 vaccine, MNOV is valued at $26.50/share. This model is highly dependent upon continued clinical success of the company's assets and will be adjusted accordingly based upon future clinical results.

Current Price (09/02/20)	$5.37
Valuation	**$26.50**

OUTLOOK

On September 1, 2020, MediciNova, Inc. (MNOV) provided an update on the company's intranasal SARS-CoV-2 vaccine candidate that utilizes BC-PIV, a human parainfluenza virus (HPIV) type 2 vector. The company developed a series of vaccine prototypes and has narrowed down the list of potential candidates to those that induced a robust antibody response in mice following a single intranasal administration. Additional tests, including neutralizing antibody titers, induction of mucosal immunity, and antibody titer, T cell induction, and efficacy to prevent viral infection, will be conducted to identify a lead development candidate to take forward into toxicology tests and clinical trials.

SUMMARY DATA

52-Week High	**$11.00**
52-Week Low	**$2.90**
One-Year Return (%)	**-37.49**
Beta	**1.52**
Average Daily Volume (sh)	**293,958**
Shares Outstanding (mil)	**44**
Market Capitalization ($mil)	**$238**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**21**
Insider Ownership (%)	**16**
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	**High**
Type of Stock	**Small-Blend**
Industry	**Med-Biomed/Gene**

ZACKS ESTIMATES

Revenue
(In millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2019	0 A	0 A	0 A	0 A	0 A
2020	0 A	0 A	0 E	0 E	0 E
2021					0 E
2022					0 E

Earnings per Share

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2019	-$0.11 A	-$0.09 A	-$0.05 A	-$0.04 A	-$0.30 A
2020	-$0.06 A	-$0.10 A	-$0.09 E	-$0.09 E	-$0.34 E
2021					-$0.34 E
2022					-$0.35 E

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WHAT'S NEW

Business Update

Update on SARS-CoV-2 Vaccine

On September 1, 2020, MediciNova, Inc. (MNOV) provided an update on the company's SARS-CoV-2 vaccine for COVID-19 that utilizes BC-PIV, a human parainfluenza virus (HPIV) type 2 vector. MediciNova previously announced a joint development agreement with BioComo and Mie University, who had developed the vaccine technology. Please see our last report for background on the HPIV vector.

The company has designed multiple vaccine prototypes utilizing different stabilized Spike (S) protein mutants of SARS-CoV-2 in various modalities. Thus far, research into the vaccine has confirmed that the SARS-CoV-2 specific protein antigen binds to ACE2, which is a known receptor for the virus (Liu *et al*., 2020). In addition, antibody responses to the different SARS-CoV-2 mutant Spike proteins were determined following a single intranasal dose in mice. These results helped to narrow potential development candidates to those that induced a strong antibody response measured by ELISA.

MediciNova will next be examining neutralizing antibody titers through *in vivo* testing of the potential vaccine development candidates along with the following tests:

- Measuring mucosal immunity and measurement of antibody titer
- Analyzing cell-mediated immunity (e.g., CD4/CD8 T cells)
- Testing the vaccine's efficacy for preventing viral infection following an intranasal inoculation

MediciNova's development partner BioComo has established a master cell bank for vaccine production and the company is preparing to begin production such that IND-enabling studies can commence. We anticipate additional updates on the progress on the vaccine candidates over the next several months.

Intranasal Vaccination for SARS-CoV-2

A recent publication by researchers at Washington University in *Cell* described the development of an intranasally administered chimpanzee adenovirus (ChAd)-based vaccine for SARS-CoV-2 (Hassan *et al*., 2020). The vaccine was composed of a modified ChAd that expressed a modified SARS-CoV-2 Spike protein and was tested in mice. Intramuscular dosing of the vaccine induced robust systemic humoral (antibody) and cell-mediated (T cells) immunity against lung infection, inflammation, and pathology but did not result in sterilizing immunity (i.e., virus particles could still be detected in the nose and lungs following SARS-CoV-2 challenge). In contrast, a single intranasally administered dose of the vaccine completely prevented SARS-CoV-2 infection in both the upper and lower respiratory tracts, thus showing the potential for an intranasally administered vaccine.

We are aware of only one other company developing an intranasally administered SARS-CoV-2 vaccine, Altimmune (ALT). Altimmune recently announced preclinical results showing a strong CD4+ and CD8+ T cell response to its SARS-CoV-2 vaccine candidate (AdCOVID) following a single intranasal administration. In addition, there was evidence for the induction of a mucosal T cell response in the lungs, which has not previously been shown with other vaccine candidates administered intramuscularly or subcutaneously.

We believe intranasally administered vaccines will have a number of potential advantages over other vaccine technologies, including immunity achieved through a single dose, thus mitigating the risk associated with patients needing to return for a booster shot, mucosal immunity that includes the induction of both IgA and IgG antibodies as well as mucosal T cells, and the ability to rapidly dose a large number of patients without the need for trained healthcare personnel due to the lack or needles or syringes. Mucosal immunity is particularly important to prevent the spread of the virus to other people, and it is likely that injectable vaccines will not demonstrate mucosal immunity.

Conclusion

MediciNova's update on the SARS-CoV-2 vaccine candidate is an exciting development for the company, as there are very few intranasally administered COVID-19 vaccines in development and there are a number of potential

advantages for a vaccine that can be administered intranasally, most notably the potential for only needing a single dose. We estimate that a successful COVID-19 vaccine (we believe there will be multiple vaccines that will eventually be approved) could generate revenues of $1 billion in a relatively short time frame, however how much revenue a vaccine generates long term is unknown given our lack of understanding regarding the longevity of the immune response to SARS-CoV-2 and if booster shots will be necessary for some vaccines. This will be a highly fluid situation as we learn more about other vaccines in development and the response to those vaccines, but for now we value the COVID-19 vaccine program for MediciNova at $100 million, which has increased our valuation slightly from $25.00 to $26.50.

PROJECTED FINANCIALS

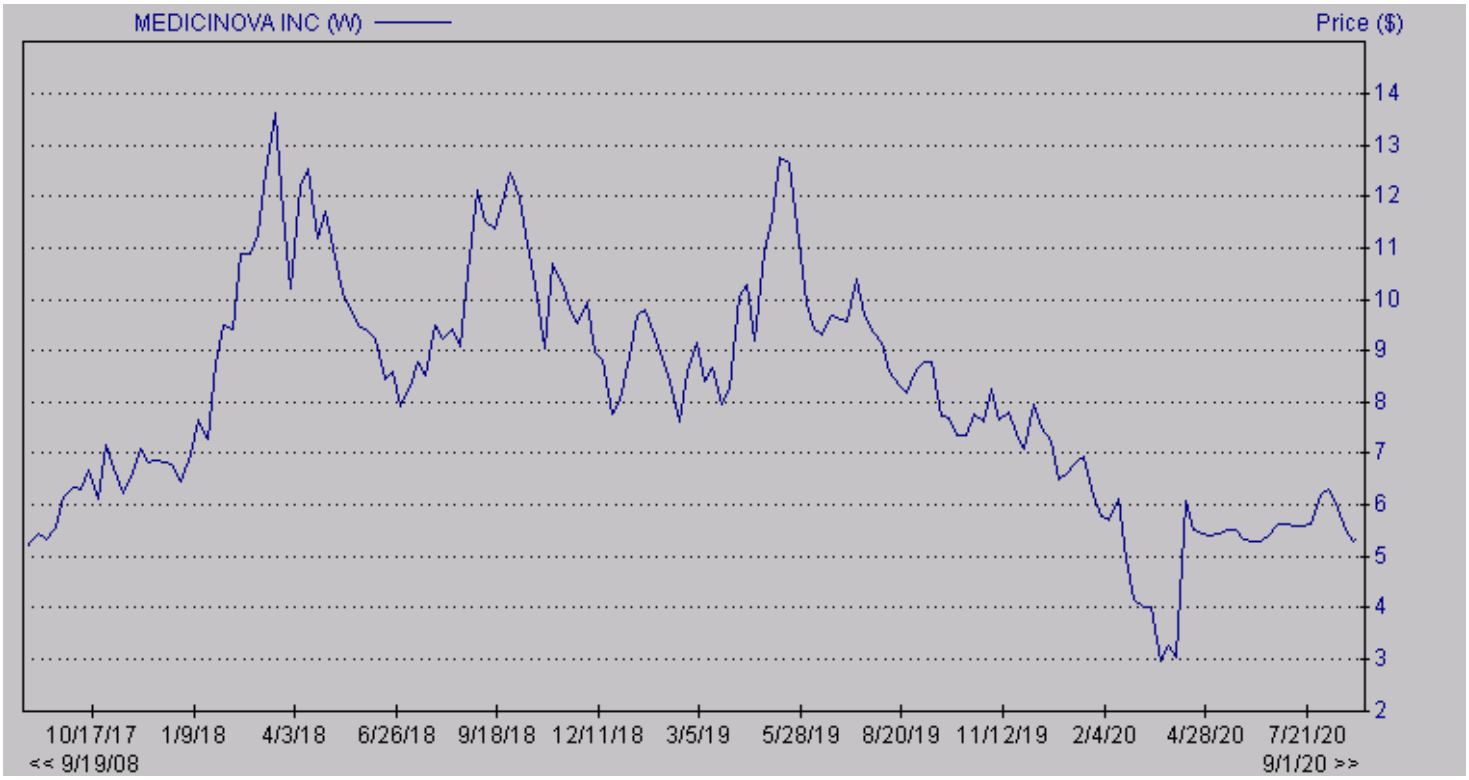
MediciNova Inc.
Income Statement

MediciNova, Inc.	2019 A	Q1 A	Q2 A	Q3 E	Q4 E	2020 E	2021 E	2022 E
MN-166 (Multiple Sclerosis)	$0	$0	$0	$0	$0	$0	$0	$0
MN-166 (ALS)	$0	$0	$0	$0	$0	$0	$0	$0
MN-166 (Addiction)	$0	$0	$0	$0	$0	$0	$0	$0
MN-001 (NASH)	$0	$0	$0	$0	$0	$0	$0	$0
MN-001 (IPF)	$0	$0	$0	$0	$0	$0	$0	$0
Grants & Collaborative Revenue	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenues	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Cost of Sales	$0	$0	$0	$0	$0	$0	$0	$0
Product Gross Margin	-	-	-	-	-	-	-	-
Research & Development	$6.079	$1.251	$2.199	$1.800	$1.800	$7.050	$9.000	$10.000
General & Administrative	$7.952	$1.674	$2.311	$2.200	$2.400	$8.585	$8.500	$9.000
Other Expenses	$0	$0	$0	$0	$0	$0	$0	$0
Operating Income	($14.0)	($2.9)	($4.5)	($4.0)	($4.2)	($15.6)	($17.5)	($19.0)
Operating Margin	-	-	-	-	-	-	-	-
Non-Operating Expenses (Net)	$1.1	$0.2	$0.1	$0.1	$0.1	$0.5	$0.4	$0.4
Pre-Tax Income	($12.9)	($2.7)	($4.5)	($3.9)	($4.1)	($15.2)	($17.1)	($18.6)
Income Taxes Paid	($0)	$0	$0	$0	($0)	$0	$0	$0
Tax Rate	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Net Income	**($12.9)**	**($2.7)**	**($4.5)**	**($3.9)**	**($4.1)**	**($15.2)**	**($17.1)**	**($18.6)**
Net Margin	-	-	-	-	-	-	-	-
Reported EPS	**($0.30)**	**($0.06)**	**($0.10)**	**($0.09)**	**($0.09)**	**($0.34)**	**($0.34)**	**($0.35)**
YOY Growth	-	-	-	-	-	-	-	-
Basic Shares Outstanding	43.159	43.949	44.092	44.200	44.400	44.160	50.000	53.000

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

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HISTORICAL STOCK PRICE



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